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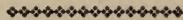
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CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.



"EVERY man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruit, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kind of private princedom, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned." ♦ ♦ ♦ ♦ ♦

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON. ♦ ♦ ♦

"OUR English word To BUILD is the Anglo-Saxon Býlsan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"ALWAYS be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE. ♦ ♦ ♦ ♦ ♦

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The Architecture of our Large Provincial Towns.

XII.—EDINBURGH.



ERHAPS there is no city in the world more strikingly picturesque in its ensemble than Edinburgh—none in regard to which it may more safely be affirmed that, whatever the visitor has heard of it in advance, the reality is not likely to disappoint him. The Old Town by itself must always have been picturesque, with its long irregular main street stretching up the sloping ridge and culminating in the castle rock and the fortifications, and its lofty sombre-looking stone houses with their back walls plunging down the slope, far below the street level, to find foundations on the lower ground, and the narrow steep passages or "wynds" between the houses. But its picturesque quality has been immensely enhanced by what might have had the opposite result—the erection of the New Town immediately adjoining the old. It is not probable that

those who schemed and laid out the New Town had any theory in their minds as to the picturesque effect of contrast of line and character; it was built at a time when prim and symmetrical composition, both in regard to separate buildings and their grouping, was the order of the day in this kingdom, and exercised its influence over cities as far remote as Edinburgh and Bath. And yet, if those who planned the New Town at Edinburgh had purposely thought out a scheme for giving the greatest effect to the combined aspect of the whole city, they could scarcely have done better. Never was there a more happy accident in city scenery than that which resulted in the contrast between the long straight lines of the New Town streets and the classic repose of their architecture, on the lower level, and the high irregular skyline and picturesque architecture of the Old Town on the other side of the dell which separates them. Princes-street forms a kind of base line to the irregular play of the Old Town rising above it, and the vertical height of the Castle and its rock is emphasised by contrast with this strongly marked horizontal line at its foot. From any point where the general effect of the city can be taken in, it seems more like a grand composition made for effect by a

landscape-painter than a city constructed for the everyday practical purposes of habitation.

This contrast of effect is best seen in connexion with Princes-street. The general view of Edinburgh from the Calton Hill, which forms one of our principal illustrations, emphasises rather the general effect of the city from a point further east—

"Piled deep and massy, close and high—"

as Scott has it. But the contrast between steep and level lines is well shown in the sketch of "The Castle and the National Gallery," and in this case the effect was probably intended; it was not for nothing that Playfair designed those long low solid masses of classic architecture, the National Gallery and the Royal Institution (which groups with the former and would come immediately to the right of the sketch) for a position in which the high lines of the Old Town and the Castle were to be seen over them. But before we go into the architecture in detail, it will be worth while to give some account of the stages by which a city so historically interesting developed into its present form.

The historical development of Edinburgh can best be treated in connexion with the physical characteristics of its site. The



Fig. 6.

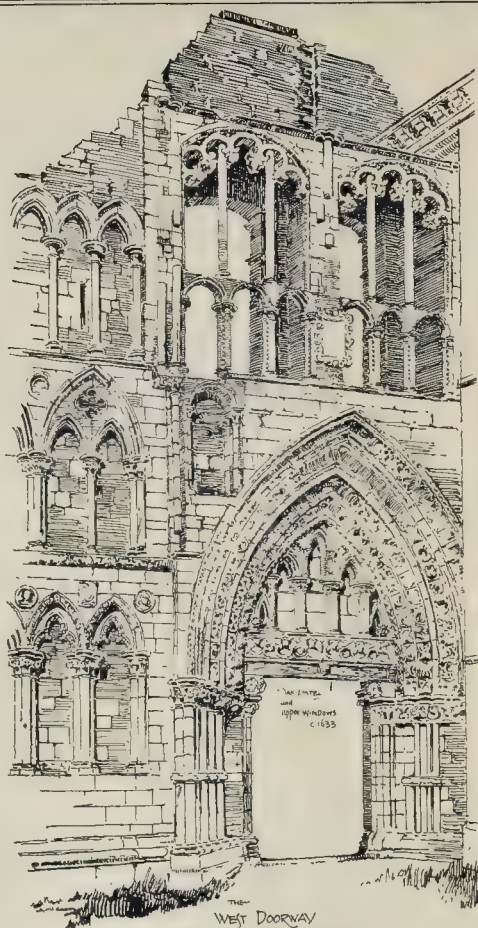


Fig. 6.—Holyrood Abbey.



Fig. 7.

Old Houses near St. Mary's Cathedral.



Fig. 8.

1750, when the matter was taken seriously in hand and carried through largely by the instrumentality of Lord Provost George Drummond. Tentative efforts for the improvement of the Old Town and the formation of new quarters without it preceded and accompanied the grand undertaking of bridging the northern valley and laying out a new quarter on the broad and open ridge beyond it. In the mass of tightly-packed tenements squares were opened, of which Mylne-square, close to the Tron Church, was

the earliest; outside the Netherbow, New-street to the north, and St. John-street to the south, of the Canongate, introduced in that quarter houses of a more commodious type, while George-square, dating about 1780, represents an important improvement on the south, the traditional quarter for extensions of the civic boundary. The neighbourhood of George-square could not, however, compete with the attractions offered by the fresh sites upon the north, and, after the North Bridge had been made passable in 1772, the New

Town was commenced upon a monumental plan designed in 1767 by James Craig. Plans of the beginning of this century exhibit the New Town of Craig, extending from the Register House to Charlotte-square and from Princes-street to Queen-street, with indications to the north of the streets and circuses centering in Great King-street, but no scheme for the Moray-place district (laid out by Gillespie Graham about 1822) or for the parts west and north of Queensferry-street. Still less was there any thought at



Fig. 10.—Holyrood Abbey.



Fig. 11. Holyrood Abbey.

the time of the present extension of the city by the south-western and southern suburbs of Merchiston, Morningside, and Newington, which now contain so large a section of the population.

The real transformation of Edinburgh from a mediæval to a modern city was effected within the present century, and is due to the complete change in the lines of communication rather than to the mere laying out of new quarters. The new districts remained at first mere adjuncts of the original city. The New Town was entered from the Old by the North Bridge, but there was no way out from it, and Craig, in his plan, never troubled himself about the ground beyond it to the west or east. The approaches to Edinburgh were then the same as they had been for centuries, and were directed exclusively towards the old part of it. Nowadays these approaches are no longer conditioned by the natural features of the site or the disposition upon it of the original population, but open up access from every quarter to the extended city as a whole, while a similar transformation has been effected in the Old Town by a remodelling of the internal communications. Of the old approaches Lord Cockburn wrote, "I wish that anybody had thought of preserving the lines of these old *Appians* in an intelligible map. They seem to have been planned, or rather used—for there was no planning about them—not so much for the convenience of the people, as with a view to keep enemies out. Narrowness, crookedness, and steepness, was the principle of them all."

How great has been the change may be

realised from the following comparisons. In the early part of the century Princes-street led nowhere. Eastward the line of it ended abruptly just beyond where the Post Office now stands, and a nest of houses intervened between this point and the valley dividing the broad ridge of the New Town from the crags of the Calton Hill. This valley is now spanned by a bridge, the Regent Arch, and the monumental Waterloo-place, designed about 1815 by Archibald Elliot, connects the line of Princes-street with the Regent-road, cut on the flank of the Calton Hill, that forms the chief line of communication with Haddington, Berwick, and the South. Previously, the Haddington-London road had started at the foot of the Canongate and climbed the declivity of Abbey Mount. The way to Leith, which now opens conveniently from the junction of the North Bridge with the east end of Princes-street, started in the last century from the Netherbow, and ran in the hollow of the ravine between the New Town and the Calton Hill. This old "Leith Wynd" is nearly obliterated by Jeffrey and Cranston-streets and the North British Railway. In modern Edinburgh the line of the North and South Bridges is continued southwards by broad, straight thoroughfares, leading through populous Newington, and ending in the new Dalkeith-road that forms the main route to Kelso and the Border. In Arnot's time, about 1779, the ground where these thoroughfares run was accounted of small value owing to the "badness of the access," while the narrow and tortuous street called "Pleasance" formed, Arnot tells us, "the principal road

to London," and this descended into the Cowgate valley and climbed the central ridge by St. Mary's Wynd to the Netherbow, opposite the spot from which Leith Wynd started for the seaport. Still in the south, the "narrow, mean street called Potterrow" (Arnot) and Candlemaker-row, both of which are still in use, formed the only means of access to the town, and the latter only landed the traveller in the Grassmarket, the former (by its extension, the Horse Wynd, now Guthrie-street) in the Cowgate, from neither of which was there convenient access to the High-street. At present the ample thoroughfare of George IV. Bridge collects the traffic from these regions and bears it in on the level to the middle point of the ridge of the High-street. Those who seek to gain the same spot by ascending one of the narrow closes from the Cowgate—previously the only means of access—can realise the advantage of this great internal improvement. In this part something still, however, remains to be done in the opening for wheel traffic of the Middle Meadow Walk, which would afford a new direct access to the town from the rapidly growing southern suburbs by way of Forrest-road and George IV. Bridge.

On the west of Edinburgh the broad sweep of the Lothian road (still needing improvement at Earl Grey-street) brings the population of the south-western suburbs townwards, and lands them at the west end of Princes-street, the great modern centre for the radiation of lines of traffic. To the unfortunate fact that the designer of the New Town never thought of westerly extensions is due the unsatisfactory aspect of this point, which lacks architectural dignity and that spaciousness which marks the best parts of the extended city. From this centre an extension of Princes-street leads to the Dairy-road, the present avenue of ingress from the west, while the new Queensferry-road crosses Telford's handsome Dean Bridge over the Water of Leith ravine, and, bordered by new terraces, stretches away en route for the north.

Edinburgh.
South side of Holyrood Chapel.



Fig. 12.

On this side of Edinburgh, where broad and frequented roads connect populous suburbs with the business centres, the traveller in the old coaching days would have found all the roads from Lanark, Glasgow, Stirling, &c., converge at a place a little to the west of the Grassmarket, still called "Main Point," from which there was a narrow descent to the famous West Port, at which point also came in the important old road to the north by Queensferry, still in use, though modernised in the part known now as Queensferry-street. The West Port admitted to the Grassmarket, but not to the town proper upon the ridge, access to which was only to be gained up the steep and winding West Bow. This passage, the lines of the topmost and lowest sections of which are still preserved, led from the north-east corner of the Grassmarket to the High-street, and was, as Chambers remarks, "before the opening of the city by means of the bridges, the principal entry for wheel carriages into the *high town*," while "through it passed all the processions of the Scottish monarchs, when they formally entered their beloved capital." It was, however, so steep and awkward that vehicles are said to have been taken all the way down the Cowgate and back again up the High-street from the Netherbow to avoid the direct ascent to its head. The excellent improvement of Victoria-street has done away with this quaint though inconvenient feature of the Edinburgh of old, while Johnston-terrace, cut in the flank of the Castle Hill, like Regent-road in that of the Calton, carries

traffic by an easy acclivity from the west end of Princes-street to the head of the High-street.

In this way has Edinburgh been transformed as well as extended. Within the old city as well as in the suburbs all the main arteries of communication, with the single exception of the High-street, are new; while the old ones, where they still exist, have sunk to insignificance. The characteristic features of old Edinburgh are by no means, however, obliterated, and there is no more interesting occupation than that of pacing the ancient routes and noting the surviving monuments, with a thought of the picturesque and animated scenes of which they were in old days the silent witnesses.

Returning from history to architecture, we may begin by following the line of the two main streets of old Edinburgh, from the Castle down the High and back again through the Cowgate. The Castle is not so much architecture, from our present point of view, as mediæval engineering more or less restored or defaced, and its architectural effect really depends on its irregular and picturesque massing and outline and its effective position. A view of it taken from the opposite side of the Grassmarket forms the subject of one of our plates, and gives a good idea of its aspect on the south side. The wall on the extreme right of the view is that which forms the boundary of the comparatively modern Esplanade or large courtyard forming the present access to the main entrance. We give a sketch of the Argyll Tower (fig. 1) as restored by Mr. Hip-

polyte Blanc,* who has also done a fine piece of interior restoration on a large scale in the old Guard Room. There is also an important piece of practical building going on in the higher portion of the Castle precinct, in the shape of a new infirmary and isolation ward which are being carried out by the War Office (under the immediate superintendence of Major Norris, R.E.), with the object of producing a building of this class which shall be perfect in its sanitary conditions as to isolation, ventilation, and every other requirement, and at the same time architecturally in keeping with the general character of the Castle buildings. From the Esplanade descends the short "Castle Hill," leading into the Lawnmarket, the two together forming the upper part of the line of the High-street. At the top of the Lawnmarket, and conspicuous at the junction of that and Johnston-terrace, is a Gothic church by Pugin, not very remarkable in a general way, with a tower and spire which makes an important feature in the architectural effect of the city; owing to its elevated position it is seen from every point, and so effectively as rather to weaken the theory that a spire should not be built on the top of

* The Argyll Tower, formerly known as the Constable Tower, was built in David II.'s time, towards the close of the fourteenth century. At the end of the sixteenth century it was injured in a siege, afterwards repaired in the style of the day, and at the beginning of the present century the parapet was removed and an additional story formed with thin walls. This modern upper story has been removed and the tower completed in the manner of its original design and construction. It is thus to a certain extent a sham, of course; but that is perhaps better than the way it was left before.

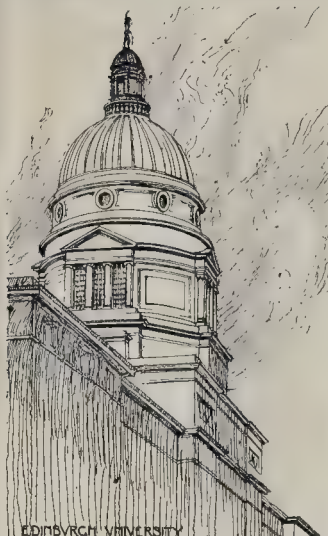


Fig. 13.

a hill; the position of this spire at all events is a success. On the left of the Lawn-market, opposite the church, is the back of Playfair's Free Church College, the front of which faces down the hill towards the new town, and is shown in one of our lithographs, reproduced from a drawing of Playfair's, or one made under his direction. The front really looks more effective than the drawing would lead one to suppose, and, like Barry's piece of early revival Gothic at Birmingham,* the building has that quality of balance and proportion by which a fine architect can make us forget and forgive rather weak detail. The interior courtyard, though rather small, is also effective, with a great flight of exterior steps at the upper end, to the Lawn-market level, while Pugin's spire is seen with fine effect looking over between the two wings of the building. While we are down on this lower level, we may continue eastwards a little way to look at another important building which forms part of the ramparts, as it were, on the side of the Old Town where the ground slopes downwards towards the New Town; this is the Bank of Scotland (the late David Bryce), the northern side of which, looking over the New Town, is shown in one of our lithographs; this is really the back of the building, the front looks the other way, up George-street, and is a very nice piece of Classic architecture, but the real effect of the building is on the side shown in our view, where it rises from among the trees and off a massive basement built up from the slope; this, like the flight of steps in the courtyard of the Free Church College, is one among many instances of the splendid opportunities and suggestions for special architectural effects which are furnished by the steep inclines and varying levels of the site, in the Old Town more especially. Coming up the short street, facing the Bank, into the "High" again, we are opposite the County Hall, a building with a columned front, of no particular interest, and just below are the

* The King Edward School: See the article on Birmingham architecture, *Builder*, November 27, 1897.

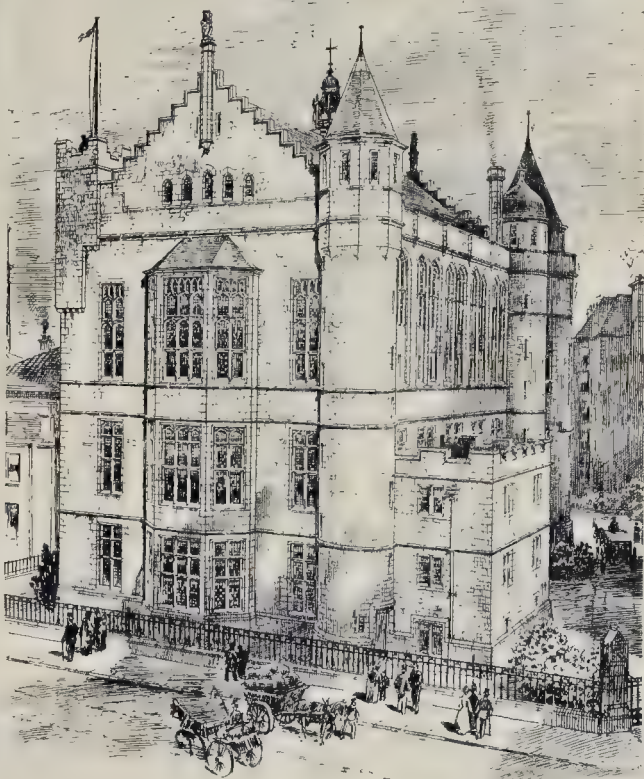


Fig. 14.—The University Union (Messrs. Sidney Mitchell and Wilson).

old Parliament House and St. Giles's Cathedral, the former set back behind the cathedral so as to form what may be called a semi-quadrangle, but unfortunately with no axial relation to the cathedral. The Parliament House is now remodelled as the Law Courts, the old Parliament Hall forming a *salle des pas perdus* to the courts. Externally it is a flat prim-looking respectable classic front by Reid, the one merit of which is its breadth and simplicity of treatment, the rusticated ground story being carried all round, and the upper story slightly diversified with columns at the centre and wings, and the re-entering angles rounded off to a quadrant also decorated with columns. One is reminded here that it is curious that, in spite of the general beauty and effectiveness of Edinburgh as a city, and a kind of reputation which hangs about her as a place of fine buildings, she possesses no great buildings of the civic and religious class, such as those which we generally look to as the principal buildings in a city. In most cities one expects to find the municipal

buildings, the courts, and the cathedral, the most important architectural glories of the place. But in Edinburgh the national cathedral, though fine internally, is merely a large parish church; the modern episcopal cathedral of St. Mary's (which in Edinburgh is regarded as a large Dissenting chapel would be regarded in London) looks like a large parish church trying to fancy itself a cathedral, and is a building in which the failure of the Gothic revival seems to be accentuated; the Law Courts, as just remarked, is of very secondary interest architecturally; and as to municipal buildings, Edinburgh beguiled architects into a great competition for a building which was never carried out, and we observe that the present poky little structure, on a site of which the possibilities are simply splendid, is being rebuilt piecemeal in an economical manner under the local Surveyor's department. It is a rather remarkable local peculiarity, that nearly all the really fine buildings in Edinburgh, old and new, are educational buildings; the staple industries of Edinburgh, we were told,

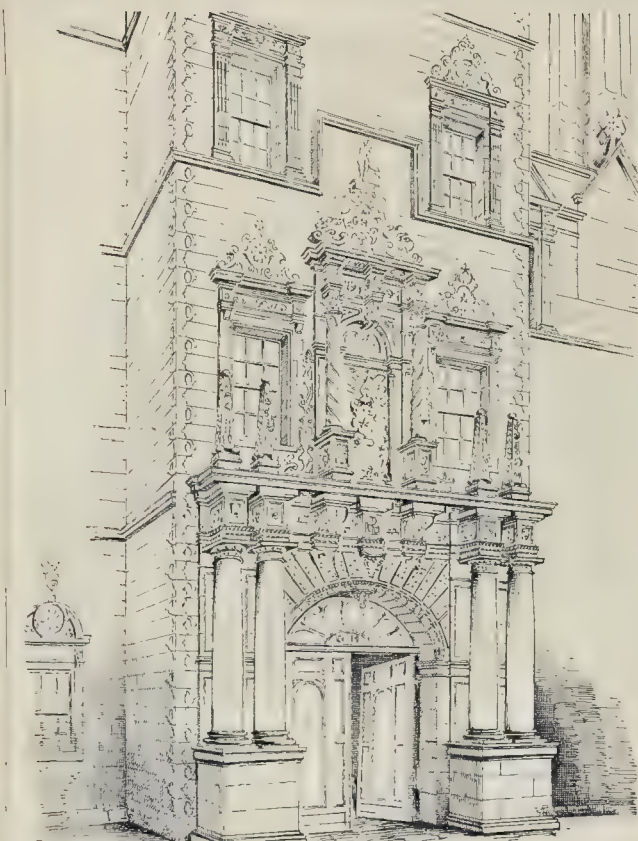


Fig. 13.—Main Entrance, Heriot's Hospital.

are "beer and education;" beer does not (naturally) make much show architecturally, but education stands up bravely in that respect, and has been the parent of a remarkable set of buildings.

St. Giles's has been fully described and illustrated in our series of Scottish Cathedrals (see *Builder* for August 5, 1893); we give among our lithographs illustrations of two monuments in it,* both designed by Dr. Rowand Anderson; and we subjoin a sketch (fig. 2) of its only characteristic external feature, the "crown" termination so familiar in views of Edinburgh. The remaining note-worthy feature in the High-street, the well-known Tron Church, with its tower buttresses in the shape of angle-columns standing free, is highly picturesque; there is also the restored market cross, standing on or near the spot where stood the old one, the destruction of which called forth Scott's spirited denunciation in "Marmion": not a very remarkable work.

The High-street itself, with its tall houses and the clothes hanging out to dry from poles thrust out of the windows (a custom one is surprised to find still kept up) is one of the most characteristic sights in Edinburgh, and notwithstanding the partial modernising that has gone on, to

walk down it is still like going back into another century. A view of part of it is given in one of our plates, including the house which is called John Knox's (but "that's but idle clashes"); the character of some of the old buildings may be seen in figs. 3 to 6, among which the name of "Wariston's Close will be unpleasantly familiar to more than eighty architects who lost their time and talents over the sham municipal buildings competition; one of the most characteristic of all is the narrow "South Cray's Close" on the south side of the Canongate (the continuation eastward of the High-street), with its tiers of clothes hanging out, seen against the narrow strip of sky between two lofty walls; a sort of corner to be found in few large cities in England now. On the same side we also come on the old gate-piers of Moray House. The electric lamp standards down the street serve to intensify, by contrast, its old-world character. While we are speaking of the more ancient street buildings we may digress for a moment to notice two sketches of old houses in the western quarter of the city, near St. Mary's Cathedral (figs. 7 and 8) which are also interesting specimens of old Edinburgh architecture.

In the open space outside the town, where the lines of the Canongate and Cowgate meet, lies Holyrood Palace, with its French-château-looking front (see plate), of

which the portion of the interior open to the public is disappointing in an architectural sense, though full of interest historically. The modern Gothic fountain in front of it, with its small portrait figures, is well done, and suits the *genius loci*. Through the north-west angle of the courtyard we enter the ruined nave of Holyrood Abbey or Chapel, of far more architectural interest than the palace. Sketches of portions of it are given in figs. 9 to 12; the first three by Mr. McGibbon. Fig. 12, showing a portion that is not easily accessible by visitors, is from a sketch by Mr. R. W. Paul.

All that now remains of Holyrood Chapel is the nave—roofless since 1768—of eight bays, walled in at the entrance to the crossing, and the northmost of two western towers. Limited in extent, there is considerable wealth of carving and diversity in arrangement, for the north aisle wall differs from the south, and in variety of style there is Norman, Transitional, Early Geometric, and Decorated, besides the non-descript portion at the western window. The earliest work is found at the Abbot's door to the cloister that lay south of the church; but only its inner face is seen by the ordinary visitor. The wall of the north aisle (fig. 11) is late Transitional; the corresponding south wall is similarly arcaded, but the heads do not intersect; the window sills, too, are higher to clear the cloister roof. In the cloister walk there is wall arcading (as at Melrose), and flying buttresses, of later date, span the walk where at the north side of the nave they are attached to the wall. These last were added in 1460-83, either to support vaulting that showed signs of failure or perhaps that only then was completed. Of the same period is a north-west door, round-headed. The south aisle, main arcade, and tower are of the early Geometric period; the last is square and only carried up for about 50 ft., more elaborated on its western frontage, perhaps because of buildings abutting on its north face: the carved heads in the circular panels are unusual features and, with the frieze of angels over the door, not unlike Italian Renaissance work. The doorway, now of one opening 9 ft. 6 in. wide, may possibly have had a centre pier and a couple of arched heads before the insertion of the oak lintel and the stone corbels that support it. Inside, the west gable has considerable elegance: the door is more carefully finished than usual, and above its apex is a fluted shaft, a form that appears again at the triforium and clearstory. Throughout the building the partiality for the detached shaft is noticeable; and because insecurely held many have disappeared. What the clearstory was cannot well be determined, beyond that the lights were within the groin of a six partite vault whose springing was below its sill. The five-light window with fish-net tracery that now fills up the west side of the crossing was only re-erected in 1816, after being blown in some twenty years previously.

In 1617 the nave was refitted by James VI. (James I. of England), and an organ erected; in 1633, for some special occasion, the western window was restored; the memorial tablet of Charles I. is over the door. In 1661, after the Restoration, the enlargement of the palace obliterated the south tower. At the Revolution in 1688 the interior was damaged by the mob and the tombs rifled; in 1758

* One of these, the Montrose monument, was specially illustrated a large wood engraving in our issue for January 4, 1890.



Fig. 16.—North Façade, Heriot's Hospital.



Fig. 17.—Part of Courtyard, Heriot's Hospital.

the roof was unskilfully repaired and collapsed ten years later. Since that date the chapel has remained a ruin.

The Cowgate, returning westward at a much lower level than Canongate and High-street, is now one of the dirtiest and dingiest streets of old Edinburgh, though originally it was one of the aristocratic quarters of the city. The most striking sight to be seen in it is that furnished by the basements of the two large buildings just below and just above the George IV. Bridge, which carries the modern high-level road across the Cowgate. The former is a tenement house effectively treated in the "Scottish Baronial" style, with massive overhanging turrets; the latter is Mr. Washington Browne's Free Library, the entrance door of which, on the bridge level, is half-way up the actual building, the lower portion forming an immense basement rising from the Cowgate level. The effect of height, on looking up from the Cowgate, is most impressive; another instance of the architectural value of these differences of level.

The upper or show portion of the Free Library was illustrated from the architect's drawings in the *Builder* of July 16, 1887, but an illustration from another point of view will be found in one of our plates in the present issue. It is a dignified stone building in a modification of Francis I. style, with an interior admirably arranged for its purpose. On South Bridge, which runs parallel to George IV. Bridge a little further east, we come on the principal building in what may be called the education centre of Edinburgh, the old University, at the angle of South Bridge and Chambers-street; externally a characteristically "Adamite" design, broadly treated, with a rusticated ground story with great semicircular windows, spoiled as usual by the two vertical mullions cutting into the curve; and windows with the usual type of moulded architraves above, set in a great expanse of

stone wall, the whole with that smooth artificial look of the Adamite type of architecture, as if it were built out of a toy box of bricks. The cupola, an elegant one, of which we give a sketch (Fig. 13), was added by Dr. Rowand Anderson a few years ago. Part of the internal quadrangle (the best part of the building), is shown on one of the plates; the graceful treatment of the upper end, with its colonnaded quadrants in each angle, is the design of Adam; the side façades were modified by Playfair. There is a largeness of manner about this quadrangle which there is not on the exterior, and the two flights of steps on each side (only one appears in the view), with their curved balustrades, add to the stateliness of the effect. Turning round into Chambers-street, we come on the long front of the Industrial and Art Museum, the centre part recessed between two end pavilions and with a wide flight of steps to the doorway (steps count for a great deal in Edinburgh architecture); the design of the late Captain Fowke, and a poor concern it is architecturally. In the interior, which has the merit of being well lighted, they have one thing that we have not got in London, viz., the Mausoleum order with the column complete, instead of being docked of part of its height, as it is at the British Museum. The Heriot-Watt College opposite need not detain us either, and turning to the left down Bristol-street we come to the great block of the Medical School and the McEwan Hall, which is in close architectural connexion with it. We gave illustrations and the architect's own description of the McEwan Hall a few weeks ago, but we have included a view of it in the plates of this number, as it could not be omitted from illustrations of Edinburgh architecture. The actual scale of the Hall is larger than the illustrations conveyed. The exterior strikes one by the great beauty and finish of the masonry (of stone from Prudham quarries, near Hex-

ham) and the delicate and refined style of the carved ornament, of which there is not too much; on the other hand, it strikes one that there is a little too much of panelling, which is not a truly masonic form of decoration, and we should have thought the effect bolder if the lower part of the buttresses had been kept plain and the string courses of the main wall been allowed to butt against them. The circular projections contain the staircases to the galleries, and form a very good example of architectural effect arising from the treatment of a practical feature. Internally a corridor runs all round the hall, but each staircase has its own street access. The interior of the hall is striking in effect; it is theatre-shaped and surrounded by a lofty arcade on columns rising nearly the whole height of the interior, the fronts of the galleries butting against the columns; the pedestals to the columns strike one as a little too lean, a defect perhaps arising from the desire to avoid encroaching on seat room on the ground floor. The decorative artist has got out of control, and has spoiled the interior somewhat by a number of wall paintings which are not flat enough for decorative effect; the painting over what may be called the proscenium arch, a small study for which was exhibited at the Royal Academy a year or two back, is a complete failure, as the design is quite lost where it is, and only succeeds, from its over-accentuation and want of flatness, in giving a ragged appearance to this portion of the architecture. But architecturally, both internally and externally, the McEwan Hall is a fine and in some respects a unique building, and an honour to its architect, whose claims to recognition seem, from all accounts, to have been a good deal overlooked at the opening ceremonial, as in fact is usually the case in this country, where architectural designs are apparently sup-

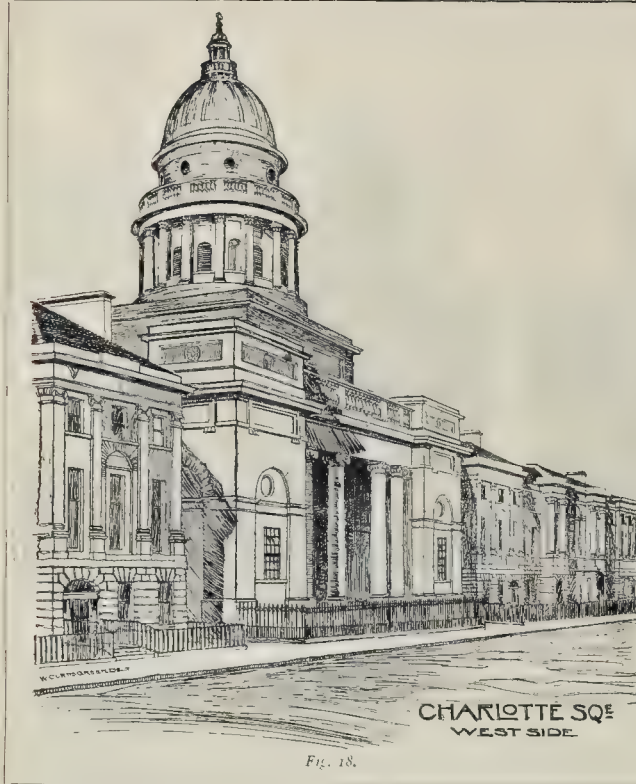


Fig. 18.

posed to grow of themselves. The stone lamp standard in the space in front of the building, seen in the view, is a very graceful design, presumably also by Dr. Anderson, and apparently (from the inscription) intended as the City's monument to the donor of the hall. Facing another side of the triangular place in front of the hall is another comparatively new building, the University Union, a home for students, an effective building in a kind of blending of French, Scottish, and Englishdomestic Gothic; the flanking turrets, like those of Holyrood, have a very French appearance. The sketch (fig. 14) shows what may be called the back of the building, one of the turrets referred to is seen at the further angle. On the left of the view of the McEwan Hall is seen a part of the back of the Medical School, a portion of which (not seen in the view) is very boldly treated by ecessing part of the wall on the ground line, and bringing it out again above on a series of great cantilevers carrying deeply set window arches. To get to the front of the Medical School, we go round the outside of the McEwan Hall, and come to the two main façades to the street and the gardens (see view on another plate). The carriage entry from the street is through an archway carried on massive coupled columns dividing it from the footway entrance, and giving access to a courtyard where the buildings, especially the nearly blank wall opposite the entrance, seem a little too high for the area of the courtyard; but the treatment is dignified and solid, like that of the whole building. The tall chimney seen in the rear of the building acts, among

other purposes, as an aspiring flue for the ventilation.

From this modern educational centre, 200 yards westward brings us to the gate of that renowned building, Heriot's Hospital, which under present circumstances seems to turn its back on the street (Lauriston-place), the main entrance (fig. 15) being on the opposite face to the road; fig. 16 shows the whole of this entrance side; the face towards the road, with the oriel window of the chapel so picturesquely breaking the line of the front, is shown in the view on one of the plates. Fig. 17* shows part of the internal courtyard, with the open arcade and the effective introduction of the staircase turret at the angle. Heriot's Hospital, in spite of the fact that its detail belongs to a mingling of styles, may be said to be one of the most perfect buildings in existence; one of which it is impossible to speak without enthusiasm, it is such a remarkable combination of dignity and symmetry of general design with richness and effectiveness in detail. Among minor points it may be mentioned that the decorative gablets over the windows are all different in design; one may notice also the piquantly decorative effect of the treatment of the angle rustications (seen in fig. 15). Whoever worked out the design was a true architectural genius. The large block of the Infirmary, on the south side of Lauriston-place, an effective building enough, serves to group well with Heriot's Hospital, though

of course far inferior to it; still, it is a pity, the two buildings being so nearly opposite, that the front block of the Infirmary was not placed axially with the Hospital. Close to the east side of the Infirmary is George-square, before referred to as an early attempt at a "New Town" on the south side of the old city; well meant no doubt, and perhaps these are good houses internally; but externally a dreary waste of unrelieved flat grey stone-work. Buccleugh-place, just south of the square, is in nearly the same style; in the centre of its south side, where an elliptical wall-arch encloses two doorways, one of them blocked up, a tablet records that "Francis Jeffery lived here, and here the *Edinburgh Review* was founded."

There is little of architectural interest in the two Greyfriars churches; back to back beneath one external building, which stand in their large churchyard east of Heriot's Hospital grounds, yet it is a place that no visitor to Edinburgh should miss, as well for its historic associations as for its picturesque site. Along the north-east side are the backs of some of the oldest of the smaller Edinburgh houses, with their clothes-drying poles stuck out into the churchyard, and beneath these, backed against the wall, a whole array of weather-worn Elizabethan and Jacobean tombs and monuments, while at the end of a long walk stands the Martyrs' Memorial, a simple slab flanked by small Ionic columns, inscribed with rude but sincere verse in memory of hundreds who had suffered for conscience' sake. Never, perhaps, was there so simple and unpretending a monument of such tragic events. The church externally, of very "debased" Gothic with pyramidal finials to the buttresses, has a character of its own. It was to the Old Greyfriars church, the easternmost of the two, that Pleydell escorted Guy Mannering to hear Robertson preach; but the interior of the church was burnt out in 1845, and in its present state is as uninteresting as it could well be. But it is time we took a look at the New Town, and we may proceed westwards by Lauriston-place, Lawson-street, and Castle-terrace, noting in the latter the United Presbyterian Synod Hall (formerly a theatre), by the late Sir James Gowan, a bold-looking front crowned with great balls as acroteria, and next it the Parish Offices, in Scottish Baronial style with an overhanging angle turret, by Messrs. McGibbon & Ross, and coming out opposite the flank of the Caledonian Station, rather well treated with a classic order of coupled columns, by Mr. Peddie, and so on to the head of Princes-street, which, as before observed, has no proper head. Princes-street is really more noteworthy for its general aspect than for the special architectural quality of its buildings, many of which are hotels, and a hotel is pretty much the same thing all the world over. Among fronts which may be picked out from the rest, however, are the University Club, with its semi-circular columned bay in two stories, (Messrs. Peddie & Kinneir), the Conservative Club, a quiet but exceedingly refined classic front with very good detail (Dr. Rowand Anderson), and the building of the Life Association of Scotland (see plate) by the late Mr. David Rhind, in which however the upper and middle stories are too precise a repetition of each other; but it is a good building nevertheless. A good shop front by Mr. Washington Browne is

* For these three sketches we are indebted to the kindness of Messrs. McGibbon and Ross, the authors of the well-known works on Scottish Castellated and Scottish Ecclesiastical Architecture.



Fig. 19.—Workmen's Tenements, Dean (Messrs. Sydney Mitchell & Wilson).

shown on one of our plates, and the lower portion on a larger scale in another. Half-way down Princes-street on the south side is Playfair's sturdy and reposeful Doric Royal Institution, of which we give an illustration on one of our lithographs from a drawing of Playfair's time—it may or may not be his own; the building looks better in reality than it does in the drawing, however, and though, of course, totally inapplicable in style in a logical sense, is a really fine piece of Greek revival. The Scott monument, a little eastward of it, can hardly claim the praise of being a good piece of Gothic revival—but Gothic had not fairly been revived then; the detail is coarse and cabbage-like, yet for its day it was a really creditable effort to produce a monument which should have something of the romantic effect proper to its object, and one respects it as a concrete manifestation of the enthusiasm of the Scotch in honour of a Scotchman who was not only a great writer but a truly great man. The illustration of it (see plate) is reproduced from one of the original lithographs of Kemp's design, made to assist in getting subscriptions towards the monument, and thus has a certain historical interest. Proceeding eastwards, we come to the low level Waverley Station, which is now and has long been in a perfectly disgraceful state of squalor and confusion, and it is to be hoped that its reconstruction will be vigorously proceeded with. Between it and the street the great new hotel, the result of a competition, and the drawing of which was exhibited at the Royal Academy some three or four years ago, is in progress, but has not got far up yet. Further eastward, and we come on the south to the large and uninteresting block of the General Post Office, and, nearly facing it, one of the best designs Robert Adam ever produced, the Register House (see plate), a building which, in the

architect's tame and formal style, is nevertheless singularly graceful and pleasing in composition and proportion. Under the dome, just seen in the view, is a very fine and lofty circular hall, which it is a pity should be now used for no higher purpose than the storage of records round its walls; but this is what the whole building is coming to, for new offices are being formed in an adjoining square, and Adam's building will then become simply a store. The imitation marble flooring under the dome, by the way, is characteristic of the period. Crossing the Regent Bridge further on, which spans a low-level street, one may note that the wide middle bay of the architectural screen on each side, with the arch over it, wants something in the centre of it—a statue or something of that kind; it gapes rather at present; the screen is old-fashioned in taste but well intended, and better than nothing. The only thing one need note further at this exit from the town is the dignified and impressive though cold classic façade of the High School, by Hamilton, all the more effective for being raised somewhat above the road on the slope of the ground; it is a purely academic composition, but as such a fine thing, save for the weak treatment of the end pavilions against which the small colonnades are stopped. How far it answers as a school building we know not; its general appearance rather suggests a museum than a school. As to the Calton Hill, with its collection of curiosities, the less said about them the better; and probably most Edinburgh folk in the present day will agree with us.

The main portion of the New Town consists of three parallel streets, running east and west; Princes-street, George-street, and Queen-street. Starting from the west end again, we are in Charlotte-square, originally entirely designed by Adam, whose elevation

for the west end, with a domed church in the centre, is in the Soane Museum, and a reproduction of it will be found in one of our lithograph plates. Adam's church, however, was not carried out; the actual one being that designed by Reid, and shown in the sketch (fig. 18); and on the whole it is perhaps a better design than Adam's. Some of the details are odd, especially the immense *gutter* under the ends of the raised panels. The south side of the square, consisting of dwelling-houses only, is really a charming piece of academic design, if we can once reconcile ourselves to the entirely false treatment of the separate houses which are merged into one symmetrical elevation. George-street, which grows out of the east side of Charlotte-square, is rather impressive from its width and symmetrical laying out than from its buildings, which are mostly somewhat mean. The Bank of Scotland, however, on the north side, is a good piece of quiet Classic design, shown in one of our plates. Further east the Commercial Bank of Scotland, on the south side, shows a sumptuous Corinthian-columned front of the ordinary type, and opposite to it St. Andrew's church (Classic), with a wretchedly skimmed tower and spire, shows some originality in plan, an ellipse with its longer axis parallel with the street. George-street ends in Melville-square, at the eastern side of which the Royal Bank is effective rather from its position, at the back of a courtyard with a grille towards the road, than from anything in its very tame Classic façade. Just south of it the British Linen Bank is a typical example of the sumptuous style of Classic front, with detached columns carrying immense projecting masses of cornice breaking round them and surmounted by statues; the aspect of this piece of Classic scenery projected from the front, as seen in perspective from a point near the building, is quite absurd, and a



Fig. 20.—Workmen's Tenements, Dean. Internal Courtyard.

lesson to the architectural student as to the misuse of "the orders" in modern architecture. At the south-east corner of the square a new building, shops and offices apparently, by Messrs. Waterhouse & Son, is in progress, and promises to be a picturesque addition, but in odd contrast to its surroundings.

Returning westward along Queen-street, we come to one of the most characteristic new buildings in Edinburgh, Dr. Anderson's National Portrait Gallery (see plate), the long side of which, flanking Queen-street and not very well seen in the lithograph, seems to be half-inspired by a reminiscence of the ducal palace at Venice. The large wide pointed windows on the ground floor, the range of smaller pointed windows over, with a statue-niche and canopy between each couple, and the mass of plain wall over these, produce a façade which certainly has character. The corbelled out turrets at the angles, the corbels at the base of which are still in block, have rather an eccentric appearance, but it must be admitted that the building has a distinct originality. The interior might be better lighted for its purpose. Immediately to the northward of the Portrait Gallery what promises to be a large and important building is in progress for an Insurance Office, from the designs of Messrs. Washington Browne & Peddie, but is not far enough advanced to judge of it yet. In traversing Queen-street, one is struck with the feeling, as in George-street, that the general character of the street architecture is not equal to its position. Hamilton's College of Physicians shows a graceful Classic front, but generally speaking the buildings along the street are mean; and what a position it is for a grand street! Built only on one side, the north side open and looking down the steep slope of the gardens to the terraces in the lower portion of the New Town. If it were rebuilt as a street of first-class architecture, it would be one of the finest in the world, considering the advantages of its position.

The part of the New Town on the lower

ground northward, below the Queen-street level, has all much the same character—solidly built stone houses of a type of respectability without much architectural interest; but Moray Place, the large octagon place designed by Gillespie Graham about 1825, though ponderous in its architecture, is dignified and striking; each alternate face of the octagon is treated with a large order in front of the upper portion of the houses, entirely un-domestic in appearance of course, but effective in its way. The whole of the district is laid out with regard to axial lines and symmetry, to which much attention is paid in all the newer parts of Edinburgh. In the district in the neighbourhood of St. Mary's Cathedral (south-west) a good effect is produced in two or three places by the parting of the terraces of houses into two long crescents facing each other, forming only a small segment of a circle, not sufficiently curved to practically injure the houses, but sufficiently to have a good effect to the eye. To north-west of the town is the picturesque ravine of the Water of Leith spanned by the Dean Bridge, and where some of the best residential houses are found. The modern districts of Morningside and Mayfield, south of the Old Town, are what may be called the residential villa districts of Edinburgh, including however a house of more pretension here and there; one does not get the impression that there is much interest or picturesqueness of design in the houses generally, but the fog which prevailed on the day of our visit to this quarter certainly was not calculated to show it in its most favourable aspect.

Among the rather outlying buildings of importance which we have not specially mentioned hitherto is the picturesque Fettes College, by the late Mr. David Bryce (see lithograph), to the north-west of the New Town; Stewart's Hospital, near the Queensferry-road (see lithograph), by the late Mr. David Rhind, a finely composed and picturesque building, though we do not like the outline of the towers; and the more celebrated Donaldson's Hospital by Playfair, directly west of the town, of which an

illustration is given in one of our lithographs, from a drawing of Playfair's. In designing this dignified and symmetrical building the architect was obviously influenced a good deal by Heriot's Hospital, though it has not the simplicity of that building. Craig House, by Messrs. Sidney Mitchell & Wilson, to the south-west of the town, is a mansion of more than ordinary picturesqueness and importance, but hardly comes into the category of Edinburgh architecture, and we shall probably illustrate it separately on a future occasion. Among other buildings of which we are able to give illustrations is the picturesque block of the Royal Hospital for Sick Children, by Mr. Washington Browne (see separate lithograph), in Sciennes-road in the south district of the town; and we may also draw attention to the Bakery by the same architect, illustrated in one of the miscellaneous plates, and situated in Torpichen-street, near the Caledonian Railway Station. If the architectural treatment of this, and the large wall space in the centre with the little windows in it, accords with the practical requirements of the building, it is a very good example of architectural effect imparted to a kind of building which is too often treated as a mere mass of walling without expression. On the same sheet is an illustration of Mr. Hippolyte Blanc's Edinburgh Café, in Prince's-street; a capital example of shop architecture, of which at present there is not much in Edinburgh that is worth mention. We may also draw attention to a fine block of tenement houses, in the Dean suburb, by Messrs. Sidney Mitchell and Wilson, of which the outer view and the courtyard are shown in figs. 19 and 20.

A few words as to some of the Edinburgh churches. The finest of these, and one of the most prominent, is Mr. Hippolyte Blanc's West Church, or St. Cuthbert's, near the Caledonian Railway Station, of which an illustration on a large scale will be found in the *Builder* for May 12, 1894. This is a Classic church built onto an old Classic tower and spire; a building on a very large scale and treated with great dignity, with towers and cupolas flanking the apse on each side, the cupolas evidently rather inspired by Wren's west towers at St. Paul's, though simpler in design, as is suitable in the case of a smaller building. Of the interior of this and other churches mentioned we can say nothing, for, except the two cathedrals, churches in Edinburgh seem to be strictly locked up on week-days. Not far off, in Maitland-street, on the other side of the Caledonian Station, is St. George's Church, of fair Classic design with an angle tower of somewhat modernised North Italian character, added by Dr. Rowand Anderson, a stalk carried up quite plain to a great height, and with battering lines, and a lantern on the top; it is a fine thing in itself, but does not harmonise with the church. The same architect's Catholic and Apostolic church, in the north-east quarter of the town, a Gothic building with a small square turret at each angle, is hardly striking as an example of modern Gothic, but it is apparently not a very recent work. Among our illustrations will be found the same architect's simple and pleasing Free Church at Morningside. At Morningside is also Mr. Blanc's large Gothic building, Christ Church, in which we do not think the detail generally soars above the average of Gothic revival detail, but there is a good effect

produced by the apse facing the road, with its rather tumultuous array of buttresses and pinnacles. Generally speaking, it strikes us that Edinburgh architects are more successful in Classic work, or in work of Classic tendencies, than in Gothic; and this, of course, is in accordance with the architectural tradition of modern Edinburgh. Certainly Mr. Blanc's Free Church at Morningside, a little lower down the same road, even without the tower (which is only commenced), arrests attention at once as a broad, striking, and original composition; it is on a larger scale than the drawing (see lithograph) gives the idea of, and is very carefully detailed in beautiful masonry. For a church, it has to the eye of the Southron rather a pagan aspect, but we presume it does not strike the northern mind in this way. Mr. Blanc's Mayfield Free Church, illustrated on the same plate, is a good piece of Gothic and finely grouped and composed; we take it that it is a good deal later work than Christ Church, Morningside.

One thing strikes one on reviewing some of the most recent buildings in Edinburgh—that among the modern Edinburgh architects there is a good deal of very successful attempt at originality, a great deal of what we may call shaping power, by which a new building becomes not only a building carried out in such-and-such a style, but a distinctly new architectural conception. The McEwan Hall is certainly such, and this element of originality strikes one in other buildings also, and may lead to further developments in Edinburgh architecture of still greater interest, and still more worthy of the glorious city in which these architects have the good fortune to practise. As far as suggestiveness of site and association are concerned, the Edinburgh architect may say with the Psalmist, "the lines are fallen unto me in pleasant places; yea, I have a goodly heritage."*

NOTES.

Metropolitan Railways.
MR. MOTT, Chairman of the City and South London Railway Company and a director of the

Great Western, has just called attention to the necessity for some kind of inter-communication between the various electric railways that will presently run beneath the Metropolis. The Metropolitan Railway Company, by the Bill which they have deposited for the coming Session, seek to obtain Parliamentary powers to run this railway by electricity, and there are other underground lines which are either being constructed or have been sanctioned by Parliament. The suggestion, however, is more easy than its practical application, especially when it is borne in mind that the different underground railways are separate undertakings. For a long time the public has felt the inconvenience which results from the separation of interests, and the more numerous the companies which work underground lines in the Metropolis become, the more this inconvenience will be felt. It is all very well for the Board of Trade to sketch out main routes as suggested by Mr. Mott, but already some of the main routes are filled. That the subject requires investigation by a Commission or Parliamentary Committee we have no doubt, so that, at the

very least, legislation may be forthcoming to give the Board of Trade a more complete power over the Metropolitan railways.

The German Schinkel Competition.

It is curious to note how any great national movement in Germany always finds expression in some academic architectural competitions. We have been hearing much of Germany's naval programme, and now we hear that the Schinkel competition for 1899 is to be for the best design for a great Naval Club-house with Assembly Rooms. The competition particulars describe the proposed position of the block as being at the Naval Port, Kiel, and facing the harbour. The dimensions of the site are given as 200 metres by 150 metres, with a fall of 10 metres towards the embankment, and the scheme is to include a memorial hall, a large assembly room, minor assembly rooms, general club accommodation, with chambers, and the quarters of the Imperial Yacht Club. The subject certainly lends itself very well to an academic architectural competition.

Architectural Competition Estimates.

One of the local papers has been allowed to publish Mr. Waterhouse's Report on the Cardiff competition, a short document enough, in the course of which he states (by no means to our surprise) that he had to throw out some designs because of their misleading estimates as to cost. We saw two estimated at 9d. per cubic foot, which certainly could not have been carried out at less than 13d.; we heard a report of a very ambitious design in which the architect's estimate was based on 7d. a foot. The fact is that a considerable number of architects seem to go into a competition where the sum to be laid out is defined and limited, on the principle (if it can be called a principle) of designing the building as they think it will be most effective, then cubing it and stating such a price per foot as will bring the total within the specified limit of cost. It is impossible on any other supposition to understand the extraordinary estimates which one finds attached to competition designs. It is hardly a quite moral way of proceeding, in dealing with an amateur committee; and it is perfectly futile where there is a professional assessor who knows his business.

The Fortifications of Paris.

AFTER more than twenty years of discussion, and in spite of the systematic opposition of the military engineers, the French Government is submitting to Parliament a scheme for the demolition of the fortifications of Paris from the Seine to the Porte de Flandres, a stretch of about eight miles. It is expected that the Chamber will ratify the proposal, which will be of great service to Paris, in removing a boundary which stands in the way of free extension of the city while it is no longer of value as a fortification, and in fact counted for nothing in the defence of Paris in 1871. In its place, (if removed) a grille or wall of some kind will be erected in order to recognise the rights of the *octroi*; and around this it is proposed that there should be a zone of public squares and new roads, which will probably have the satisfactory effect, among others, of lowering house rents in Paris.

Fire Protection in London.

IN connexion with the subject of fire protection in London, to which recent events have drawn so much attention, we hear of proposed amendments to the Building Act; of a possible special Theatres and Music Hall Act; and we believe a new Fire Brigade Act is also in preparation as far as the Metropolis is concerned, whilst a Private Bill is to be brought in next Session referring to the provincial firemen. It seems time that we should give the question of fire protection our serious consideration, since for years we have been falling behind other countries, and in London in particular there is, no doubt, great room for improvement. Until recently there was a general impression that it was only the preventative measures which had been neglected in the Metropolis; whilst the Fire Department was thought to hold its own with many other places. It would now seem, however, from the many complaints, that even the Fire Department is considered anything but suitable for modern requirements; in fact, the latest stricture, which comes from a Hamburg Commission, is very severe. This Commission of experts seems to think we require entire reorganisation in these matters, and their statements should certainly have the attention of those in authority. When the Cripplegate Fire ineffect has been concluded we shall refer to this report in detail.

Accumulator Traction.

THE experiments on accumulator traction made by the Berlin-Charlottenburg Tramway Company have decided them to adopt this system on their line. Since January 12, 1896, an experimental car has been running regularly, making a daily journey of sixty-nine miles with one charge of electricity. The average speed was seven and a half miles an hour, so as to suit the other cars drawn by horses. The official report of these trials being very satisfactory, an order for a hundred electric cars was given to an American Company. The following data about them are interesting at the present time. Their total length between the buffers is nearly 12 yds., and their width 6 ft. 6 in. Owing to their length they are supported on two double-axle bogie trucks, each of which carries a motor of fifteen normal horse power. Each car can seat forty-four passengers, and the accumulators are placed under the seats on each side. The total weight of the whole battery of 192 cells is nearly six tons, and the weight of the empty car three and a half tons. As compound wound motors are used they are economically applied in descending gradients to charge the cells. In the same way, when slowing down, the motors store up a considerable part of the Kinetic energy of the car in the cells, so that frequent stoppages involve very little extra expense. The cars are luxuriously fitted with electric radiators for heating purposes, and are lighted by means of seven 16-candle-power glow lamps.

Modern Stage Mechanism.

WE have frequently referred to the advantages of improved stage mechanism for our theatres, and we have already recorded that the Drury Lane Theatre was the first to have anything like an extensive installation of hydraulic appliances. The great advantage of having a modern equipment was shown on the opening night of the panto-

* This series of illustrated articles was begun in our issue September 26, 1896. A list of those towns already dealt with, and particulars of future arrangements, will be found page xxvii.

mime, when excellent effects were obtained in the last scene by the aid of the large hydraulic "bridges" or lifts which have recently been installed. There is little doubt that as far as the mounting of spectacular pieces is concerned, we are in advance of our continental neighbours, owing to a certain extent, to our having quite a school of scenic artists and costume designers, together with the necessary funds to carry out their suggestions. Why we should, however, handicap their efforts by the antediluvian appliances which are generally at their disposal is difficult to understand, for a moderate expenditure on improved mechanism would not only add to the effect of the scenery, but be very economic for the working of our playhouses. On the Continent we generally find second-rate scenery, worked by appliances of a most modern type. In London we find good scenery worked exactly as was customary a century ago. Modern mechanism is cheaper in the long run, cleaner, and above all safer than what we are generally using at present.

Liskeard Church Tower.

THE matter of Liskeard Church seems to be getting into a new stage, as the Borough Surveyor has now reported that the tower is in a dangerous state, and that "portions of the masonry may fall at any time," and the question was raised in the Town Council last week whether, on the basis of this report from their Surveyor, they were not empowered to deal with it as an ordinary "dangerous structure," and take it down. They will no doubt gratify a great many local people by that course. Ultimately, however, a resolution proposed by Mr. Henwood, that "as the Vicar and Churchwardens were doing their best to get over the difficulty, the Council allow the question to 'slide' for the present," was carried. The "difficulty" on the part of the Vicar and Churchwardens is that they are told on one hand that the tower is dangerous to public safety, and on the other hand they are at present under an injunction from the Chancellor not to remove any part of it. The conclusion seems to be that the Vicar and the Town Council are trying to find a pretext for pulling the tower down in defiance of the Chancellor's ruling.

South Kensington Museum.

ANOTHER old English room has been set up in the Western Arcade of the South Court by the side of the "Inlaid Room" from Sizergh Castle. It is from an old house, now pulled down, at Bromley-by-Bow, and belongs to the early years of King James I., the date, 1606, having been carved on the outside of the house. The spacious stone fireplace has over it an elaborate mantel-piece in oak, with the Royal Arms very boldly carved. The ceiling bears in the centre the same arms with the initials I.R., and is covered with fine strap-work ornament, having floral enrichments and medallions containing heads of ancient warriors. An extensive alteration was made in the last century, whereby the room was shortened and the panelling was shifted to suit the new conditions. A few mouldings and door-heads of the latter period have been left out, as they were in pine wood, and consequently appeared incongruous by the side of the old oak; the room is, therefore, more nearly in its original form than when demolished. It is well set up, and shows to

advantage a fine piece of work of a kind often difficult for the student to study leisurely. Specimens of furniture of the period have been taken from the Museum and arranged in the room, in order to give it a furnished aspect. The galleries formerly given up to the pictures of the Chantry Bequest are now hung with water-colour paintings which were previously on screens. Many interesting works can thus be seen to greater advantage.

Ashburnham House, Dover-street.

In our issue of August 28 we mentioned that the Earl of Ashburnham had disposed of this house, which has for a long while been the town residence of his predecessors in that title. Together with its forecourt, garden, and stables, the house occupies the entire south side of Hay Hill, whose steep incline slopes down to the ancient course of the Aye brook, or Tyburn, and overlooks the grounds of Lansdowne House. The site, we understand, is taken for a block of flats or residential chambers. There are views of the house in two prints privately printed in 1836, and another, by Blyth, of the porter's lodge and gateways, 1773, to which we have already referred, designed by Robert Adam, for John, the second earl. Dover-street is named after Henry Jermyn, created Lord Dover in 1685, and advanced by James II. in 1689 Earl of Dover; it stands upon a portion of the grounds of Clarendon House, which, with its 24 acres of land, Christopher, second Duke of Albemarle, bought in 1675 and then sold (in part) to Sir Thomas Bond. Stafford-street (1686) marks the situation of the mansion which Pratt designed for Edward, Lord Clarendon. Lord Dover, *obit* 1708, lived in Dover-street.* The sale by his widow of Dover House—having "a large and beautiful staircase finely painted by Laguerre," is notified in the *Daily Journal* of January 6, 1727—as Colonel Prideaux lately pointed out in *Notes and Queries*. If, as seems to be the case, the purchaser was John, first Earl of Ashburnham, it appears that Ashburnham House was, or stands on the site of, Henry Jermyn's house, although some say that Jermyn lived on the east side of the street. In the 1797 Directory it is numbered "29"; it is now No. 30; at No. 29 lived John Nash, the architect.

John Wesley's House, City-road.

THE Chapel Trustees have accepted a gift of 5,000*l.* lately offered to them upon conditions that Wesley's house, latterly used as the minister's residence, shall be set apart as a Methodists' Institution and Workers' Home, and that certain liabilities (2,500*l.*) on the Chapel Trust Estate be removed. The three first-floor rooms, comprising Wesley's parlour and the bedroom wherein he died, are to be reserved in perpetuity as "Wesley's Rooms;" the rest of the house, in which no structural alterations are to be made, will be devoted to the uses covered by the endowment fund. Wesley removed to this site from Moorfields Tabernacle, "The Foundry," in 1740, and made it the headquarters of Methodism. In 1777-8 he built (and, it is said, designed) the Chapel, and there he was buried—1791—in a vault he had prepared for himself and for those itinerant preachers who should die in

* "That of the Lord Dover in the same (Dover-street) is very noble," writes De Foe in his "Journey Through England," 1722.

London. The Chapel was restored, and its foundations were reinstated, six years ago, by Messrs. Holloway Bros., contractors, under Mr. E. Hoole's superintendence. The house, four stories high, is on the right hand of one entering the burial-ground in front of the adjacent Chapel; the statue by the house is by Mr. John Adams-Acton, sculptor of the Wesley Memorial (1876) in Westminster Abbey; Wesley's tomb is in the graveyard behind the Chapel.

The Ecole des Beaux-Arts Students.

THE architectural students at the Ecole des Beaux-Arts who, as previously narrated, were silly enough to enter into a kind of rebellion against the Professor of Architecture because he compelled them to design a trellis in line instead of in wash, have been punished, under the intervention of the Department of Public Instruction, by the suspension of their studies and the closing of the architectural school till the end of January.

THATCHED ROOFS.

BY MR. HENRY ROSE.

THATCH is probably the earliest known form of roof for permanent dwellings, being extensively used in Saxon times in this country, when the low wooden huts were either covered with a thatch or wooden shingles, and as they had no chimneys, the safest place for the hearth was found most convenient, namely, on the floor in the centre. Decrees of the twelfth century relating to fires in London state that every alderman is to be provided with a hook and cord to facilitate pulling down burning houses and to prevent the spread of a conflagration; these houses were built of timber framing filled in with clay mixed with straw on hurdles and whitewashed, known as "wattle and daub"—and here it may be noted that *Dachwiz* is Welsh for a plasterer to this very day. These huts or houses were nearly all thatched with straw or rushes, but by degrees the area within which the use of such roofing materials was forbidden was extended, until finally from one cause and another, it died out altogether in urban districts, though even now, in the West of England, certainly, a few thatched buildings may still be seen in towns whose interests are represented by a Mayor and Corporation.

The Danish *Tec* and German *Dach* seem to suggest without much etymological difficulty an affinity with thatch, especially when we bear in mind that in certain parts of the country a thatcher becomes a "thacker," which may be taken—as further evidence of its Saxon origin.

Thatching, even in the rural districts, has fallen largely into disuse—except as a thin covering for hayricks—so much so, indeed, that as a special trade or calling it has almost disappeared from the list of industries carried on in this country. This is strikingly shown if we compare the census returns for England and Wales from 1851 to 1891, especially when we consider that in the fifties few villagers could read or write, so that many must have failed to make full or proper returns. These returns profess to include under "Occupations of the people" all over ten years of age in all industries. Unfortunately, the statistics have not always been taken on identical lines, so that comparisons cannot be very fully gone into—possibly a paternal Government holds that comparisons are odious, so would wish to place obstacles in the way. No occupations are given before 1851, so we only have forty years to deal with. In 1851 there were 9,303 thatchers in England and Wales, the total for the same area had fallen in 1861 to 5,355, and was further reduced in 1871 to 4,144, by 1881 the number had dwindled down to 3,719, and suffered still further diminution in 1891 when the trade was carried on by only 3,210 persons, of whom one was a female—the first appearance of the fair sex amongst thatchers. I have not been able to ascertain where she is carrying on her business, other women may have followed her lead by this time, which may gratify those who glory in what is called the emancipation of woman-kind, but I fear it is a further proof that thatching "is not what it used to be." Returns are

given under Counties in 1861 and 1891. Under Somersetshire we find 504 thatchers, of whom only thirty-seven were under twenty years of age—a proof that very few boys were being brought up to the trade—reduced to 320. From these figures it would appear—in round numbers—that in 1851, when the population was 18,000,000, there was a thatcher for every 3,000 persons, whereas forty years afterwards, when the population had increased to 29,000,000, there was one for every 9,000, a very different proportion.

In spite of all these figures, however, the fact remains that thatch is still common enough in country districts, and a very good roof it makes. Acting as a non-conductor it is found to retain the internal warmth in winter, whilst in summer it does not permit the external heat to penetrate to the interior.

Village churches can be seen covered in this manner in Suffolk, whilst in Wiltshire it is used as a coping for the “cob” walls generally built waved on plan—which often form the boundary walls of farmyards and orchards.

A thatch can be laid with or without a ridge. In Somersetshire it is almost invariably adopted, and is probably the traditional method of the West of England generally. Thatch is not much used in Cornwall, and—go still further west—in the Scilly Isles there is only one instance of its use, and that on a store or shed, between the two beaches at Hugh Town, St. Mary's, thickly thatched with heather, of “whale-back” section, covered with a heavy, large-meshed net pegged to the walls, and weighted with stones, an indication that these favoured isles are subject to storms at times, even if the grim evidence furnished by the wrecks which stud the outlying reefs is disregarded. A new post-office is being built here, the mullions, &c., and the arched entrance being of slabs of weather-worn granite dressed on the inside only, which ought to produce a solid effect, and a sketch or photograph might perhaps some day find a suitable place in the pages of the *Builder*. But to return to our subject. In Northamptonshire and the Midlands the ridge is not so usual as in the West, where some excellent thatching is done, and I am thinking at the present moment of a thatcher in a small Somerset village whose family have been in the same trade for generations—he and his son, man and boy, find almost constant employment, both take a pride and interest in their work, deriving pleasure, and I hope profit, therefrom.

“Reed” is now only another name for the best wheat straw, which should be cut from 2 ft. to 2 ft. 6 in. long, and have the heads left on. It must not be passed through a machine, but threshed by hand as if you loved it, it is usual to wet it before it is laid as it is then more tractable, and should be on the roof heads up as it grew.

“Ledgers” and “spars” are also required, the former being laid horizontally and pegged down by the latter, the usual gauge for the ledgers is 11 in., both are made from hazel or withy, cut green and split with a small bill-hook, a good deal of skill and dexterity being required. The spars are cut into lengths of about 2 ft. 3 in., pointed at each end, folded in the middle and twisted, this can be done without their breaking or splintering, the twist causing them to retain their shape as they dry, when they can be stored for future use, resembling nothing so much as a bundle of gigantic hair-pins; and here we may remark that a man with a thick head of hair is often said to be “well thatched.” Withy beds were common all over the country, and no doubt one of their chief uses was to produce a constant supply of spars. A “hovel” or a “draft” is a tool used for driving in the spars or for beating down the reed; it is not unlike an enlarged form of “dresser” as used by plumbers. Another useful implement is the “bond-twister,” which is a wooden frame, turning on an iron pin at the top of a stout ash stake, about 3 ft. long, on the principle of a gardener's line reel. When in use it is stuck into the side of a rick, and by its means is twisted a long straw rope or “bond.” In use, it looks ridiculously easy to use, but in use it is not so ridiculously easy to use as it looks. These bonds are used instead of ledgers, with longer spars for rick thatching, which is quite different to thatching a roof, though here they are also used until near the ridge, when they are no longer covered by the next course

of thatch; and thus we get two or three rows of ledgers showing at the top. When a thatch is repaired we then get extra ledgers showing, in addition to those at the top. A good, well-laid thatch will want very little doing to it for twenty years, after thirty years it may require overhauling, re-facing, or, perhaps, renewing.

It should also be mentioned that the reed—more especially the first courses—is tied down to the rafters with strong twine, a long double-eyed needle being used for the purpose; formerly this was done with fine withies, though that method is never used now. A new roof will begin to tone down in colour perceptibly in about three years, and in seven or eight will have assumed the characteristic tint that belongs to mature thatch; the patches of lichen and moss then follow and gradually cause it to decay. No gutters should be used and the soffit of thatch at the eaves must be shaved off flush at right angles to the wall and should project about 18 in. No pointing is necessary against coping to gable walls if there are any, the thatch will sweep up behind chimney-stacks so as to leave no lodgment for water, and it can be laid so tightly against the wall or stack that, provided these have good projecting weatherings above the level of the finished thatch, no rain will find its way through. The price of the best thatch should not exceed 3/- per square, including all labour and materials. Straw skeps for bee-hives are generally made by thatchers, not by means of the bond-twister, but by passing the reed through the gauge consisting of a short leather tube held in the hand, and binding it round with string as it emerges.

The characteristic feature of a thatch is the homogeneous nature of the roof it produces; it billows over dormers with gentle curves, sweeps round a valley or over a hip with equal ease; it can swell outwards to include a flat projecting bay under its protection, or can ripple gracefully over a window whose head may slightly exceed the level of the eaves, and can do each and all of these without complications or the hard lines that result from intersecting planes. The windows of a cottage tucked closely up under the eaves have a most snug and homely effect. In Somerset the walls are usually roughly plastered and colour-washed, the base having a coat of tar about 1 ft. in height; this and a sloping brick or stone border completes the protection from damp.

It is often urged as an argument against thatch that it is dangerous, being highly inflammable. A fire once started is certainly apt to spread with alarming rapidity through a thatched village, especially in a high wind. Wet blankets spread on the roof have proved the means of saving a cottage before now, but it is very probable that the heroic remedy of Saxon times, that is to say, promptly pulling the roofs of adjoining cottages, may still be the best, when any sparks can readily be extinguished.

The heavy fire insurance premium being as much as 10s. per 100l. as against 2s. 6d. only for slate or tile roofed cottages also tends to limit the use of thatch. One would suppose that some method could be adopted that would render a thatch fireproof, as silicious elements enter largely into the composition of straw, so much so that, if submitted to great heat in a retort, it can be reduced to what is practically a tube of exceedingly thin glass. Asbestos might possibly be used with advantage as a protective covering immediately below the thatch, which could then burn itself out without involving the destruction of the rooms beneath it.

It seems, on aesthetic grounds alone, a great pity that thatching should be allowed gradually to die out, especially if its place is to be usurped by corrugated iron, a material which, I regret to say, is being used on some estates where economy cannot justly be claimed as an excuse. The difference is obvious, whereas the distinction is conspicuous by its absence. H. ROSE.

MEDIEVAL CARDIFF.—At the Engineers' Institute, Cardiff, recently, Mr. C. B. Fowler gave an account of the excavations upon which he has been for a long time engaged at Cardiff Castle. Mr. Fowler gave a detailed description of the monastery of the Grey Friars, founded by Gilbert de Clare, and the excavations begun some years ago near the Herbert ruins, a portion of which are now standing in the Marquess of Bute's garden, where numerous walls were unearthed about 2 ft. below the ground. Further excavations laid bare the plan of the church. The lecture was illustrated by limelight views.—*Western Mail*.

Illustrations.

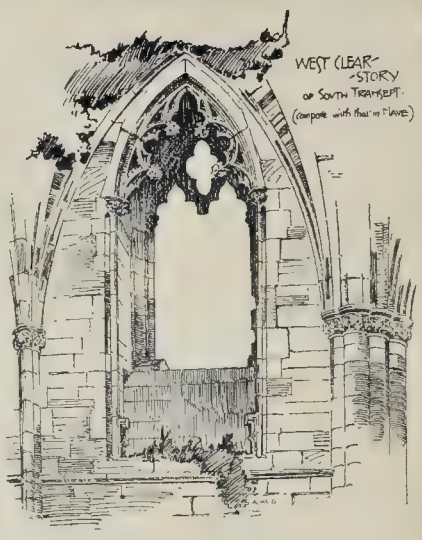
MELROSE ABBEY.*

THE abbey church of Sancte Marie de Melros appeals to the student of architecture in many different ways, each of which would be sufficient to fix his attention. The individuality of character manifested in so many parts of its design, the variety and tenderness of its ornamental carving, the comparative profusion and refined rendering of its figure sculpture, its wealth of inscriptions and their remarkable nature, the colour effects of the exquisite stone in which it is carried out, and the beauty of its mouldings and tracery, combine to render it a building of surpassing interest, and of attractions, with which few other ruined abbeys can vie. From a historical point of view more particularly, it is an open book such as does not elsewhere exist in Scotland, and whose full significance has yet to be read. It may be likened to one of the old chronicles of the convent, written in characters which are themselves works of art, beautifully illuminated and enriched, yet in a language which is not understood of the mass, and which leaves room for difference of opinion as to its exact interpretation even among those who are schooled in its derivations and grammatical construction. It is scarcely necessary to remark that Melrose must be viewed from a standpoint rather different from that which applies to the English abbeys and cathedrals. Melrose is one of the Border Abbeys, and it was for a time in English territory, but it is a distinctively Scottish building, and, in the mere matter of its date, the English archaeologist has sometimes erred. Nearly every standard by which the date of English buildings can be so accurately fixed ceases to apply in Scotland after the beginning of the fourteenth century. Up to that time Scotland followed, in the main, England's lead in ecclesiastical structures, being about a generation later. But, from the time Edward I. attempted the conquest of the country, the conditions changed; and the subsequent alienation of Scotland from its teacher is written in the northern architecture of the two succeeding centuries. The disturbed state of the country during the fourteenth century, its poverty and insecurity, had a most depressing effect upon architecture, although the work was not altogether suspended; but the fifteenth century saw a remarkable rejuvenation, which took the form of a revival of the Decorated style, modified by features derived from the late work of France and England. It is to this period that the great mass of the work at Melrose belongs; for all the work is covered by the fifteenth century, or say, from 1390 to 1505, and no building better demonstrates the high attainment, the individuality, and the eclecticism of this phase of Gothic architecture.

Melrose is the western outpost of a group of abbeys of great splendour, which form a kind of barrier on the Scottish borderland, but whose sacred character did not hinder their frequent spoliation and demolition. With the Roman wall or Tynne line of abbeys they present various analogies, which might be carried too far; it is, however, worth while to compare Lanercost and Dryburgh, Hexham and Jedburgh. Melrose is later in date than any of the rest, and can be associated only with Carlisle Cathedral, to which it bears, in many features of detail, a certain correspondence, and after the completion of which it was begun. The ritual choir, the sanctuary, and the transepts of the abbey church alone remain of all the buildings of the convent, and, although the church is recorded to have been dedicated upon July 28, 1146, there exists on the ground no indication of any church of that date. Above ground the remains of the monastic buildings have been all but swept away, yet it is difficult to believe that a Norman church of any importance could have so entirely disappeared. Two fragments of capitals of twin-shafts, two corresponding bases of Transitional date (forming part of a corbel in chapel No. 9), a grave slab of Johanna, Queen of Alexander II., and a kneeling stone, which still asks prayer “for the soul of brother Peter the treasurer,” are among solitary fragments which have come down from the conventual buildings of this period, and which do not testify explicitly to any church corresponding to those of Dryburgh or

*The series of the “Abbeys of Great Britain” is continued this month with illustrations of “Melrose Abbey.” For the list of abbeys which have already appeared, and for particulars of future arrangements, see page xxvi.

* Reed forms the best material for a thatch, and, though formerly specially grown for the purpose, is now difficult to procure.



Jedburgh. The church of which a part still remains has been erected on the south side of those monastic buildings, an arrangement unusual, but in which Balmerino Abbey and Whithorn and Iona Cathedrals are at one with Melrose. The earliest parts are probably the east wall of the cloister forming the side of the north transept, with the doorway to the north aisle and the stall alongside; the north wall of this transept and part of the arcade towards its eastern aisle, and the nave arcade and tower piers, shown by hatched lines on plan. These are of a singularly beautiful type of late Decorated work with certain Scottish characteristics, such as the half-round arches of the doorways, the slight angle formed at the springing of the arches, the retention of the lancet window with the addition of a cusped head. All these parts of the work appear as if from one hand: the mouldings bold and well drawn, exhibiting a fondness for simple unfilled beads and hollows; the carving most gracefully and tenderly modelled: work indeed of consummate skill, save perhaps where it attempts the human figure. With reference to the date of its erection we know that in 1326 Robert the Bruce gifted to Melrose the sum of 2,000*l.* equal to twenty-five times that amount in our day and having still larger potentialities, and there is little doubt that this was set apart for the erection of a church worthy of the king's munificence. The money, however, was to be paid out of fines and forfeited lands, and other revenues of the Crown, so that it did not come in all at once; and, as war came again in 1332, by the attempt of the son of John Balliol to seat himself on the throne, followed by the cession of the district to England, its recovery, re-occupation, and re-deliverance, little could have been accomplished up to 1385 in which year Richard II. entered Scotland, and, annoyed by the difficulties he encountered, set fire to and destroyed Melrose and Newbattle Abbeys.

When truce was made in 1380, Richard was generous enough to recompense the abbot by a favoured nation treatment in respect of the tariff upon his Scottish wool, and by protection from pillagers, with licence to sell in the north of England; while Robert III., in 1400, gave them special and much-needed protection from their compatriots. It is about this period, from 1380 to 1400, that the circumstances appear to favour in any way the prosecution of the enterprise of church-building, and the late character of this Decorated work confirms the inference which it is natural to draw from the history of this part of the country. The design of the cloister arcade on the west wall of the north transept, already alluded to, the rectangular frame or panel on the north wall of the transept, with its fourteen pedestals, along with the Scottish characteristics which have been noticed, point to a date succeeding that of Bruce, and fall into their right place about 1400. So far the story of the work is tolerably plain on the face of it, but from this point the different periods of erection form a tangled skein which presents considerable difficulties in any attempt to unravel it. These parts are classed together on the plan as the Later Decorated, but it is perfectly clear that they are the handiwork of at least three different architects. The following order is suggested as a tentative solution of the problem; the first division of the work (*circa* 1400) being, as already set forth, the ritual choir, up to the clearstory, with the north transept and cloister door and the tower—the parts hatched on plan; secondly, at a short interval, or by another hand, the groining of the north aisle, the wall between it and the cloister, and the vaulting of the south aisle; thirdly, the erection of the chantry chapels 5, 6, 7, and 8, and perhaps the vaulting of the nave and the flying buttresses; also the eastern arcade of the south transept, and the aisle of the north transept; fourthly (*circa* 1460), the erection of chapel 4, the

vaulting of the south transept, and the completion of the piers and arches adjoining the eastern tower piers; fifthly (*circa* 1475), the whole south front of the transept, with probably the eastern aisle of the same, and the reconstruction of Chapel No. 8, with the buttress between it and No. 7, and the raising of the pinnacles; sixthly (*circa* 1500-6), the construction of the whole east end of the church, the reconstruction of the transept clearstory windows, and the erection of the chapels 3, 2, and 1 on plan, and the chapel or chapels which existed towards the west. To justify the order and division fully would demand a mass of detail for which there is no room here, but some of the reasons will appear in the course of this description, which is based on a careful examination of the fabric.

The effect of the interior of the ritual choir, which is probably the very earliest part of the work, has been quite destroyed by its barbarous treatment in the seventeenth century, when, as the plan shows, immense stone piers were built against the northern pillars to carry a pointed wagon-vault over the choir for the purposes of a church, and the clearstory windows blocked for the upper half of their height, and arched over on the interior with a segmental arch. This wagon-vault, although it falsifies the interior effect of the abbey, has been covered with a well-executed stone slab roof, and has aided in the preservation of the fabric as a whole. The piers at the west end of the ritual choir, at the angle of the rood-screen, are heavier than the others, and an arch of triumph is thrown across the central aisle at this point in place of the ordinary transverse rib; while on the exterior to the south, the magnificent image of the Madonna and Child, with the taller pinnacle below, mark the division between nave and ritual choir and the position of the rood. The screen between nave and aisles has been built in with the main piers, although the part below the rood, with its doorway and vault, may be of somewhat later date. In the north transept the pier and arch furthest north are of the same character as the ritual choir, but carried to a higher degree of refinement, and the corbel, from which springs a shaft which bears the vaulting shafts, has been much admired for the exquisite sculpturing of a hand grasping foliage. The windows in this transept to the west resemble those which yet exist blocked up in the ritual choir, but are separated by applied shafts, carrying figures of SS. Peter and Paul, which are believed to face into their respective chapels. On the east side the clearstory windows have an inner plane of tracery, and are divided by a central group of shafts into double lancets, freely cusped, and under one arch; an arrangement which is repeated in the east side of the south transept, and in the middle bay of the west side, to the left of the single window over the south aisle shown on sketch. There being no triforium, and all these windows rising from the levels of the passage, each has



been protected by an open quatrefoil parapet. The north transept bears clearly the evidence of the night stair from the dormitory, with a round arched stoup at the foot and a round arched doorway at the top, above which is the singular frame referred to. Over this again rises the group of three small lancets with a beautiful and simple rose window filling up the apex of the gable. The general effect recalls the south transept of Hexham, where the stair remains, and also resembles Pluscardine Priory. A singular circumstance, which the plan indicates, is the encroachment of the west wall of this north transept upon the space which the position of the tower piers mark out for it, and this can only be explained by the line of the conventual buildings to the north determining the position of this wall perhaps after the piers had been set out. When the stair is deducted, there remains only $17\frac{1}{2}$ ft. as the width of the transept, the sacristy door occupying the middle of the space. On the south side of the cloister a similar irregularity is to be observed in the narrowness of the north aisle, and here it is not so easily explained. The groining of this north aisle is on the simple quadripartite principle, with ridge ribs. In the south aisle, where there is more space, the intermediate ribs make their appearance.

The wall between the north aisle and cloister is decorated on the cloister side by a trefoil arcade on corbels, with a miniature nail-head ornament on each side of the filleted bowtell which forms the salient part of the moulding. At a point indicated on the plan, which it would be reasonable to suppose the centre of this arcade, two light shafts are

carried up to these corbels, and a beautiful piece of surface tracery, with exquisite carving, takes the place of the simple trefoil, as is shown in a corner of Mr. Wass's plan. In many respects this arcade appears earlier than that of the east wall of the cloister, but its later date is conclusively proved by the way in which it abuts on the single stall to the west of the door, and the splaying back of the wall above to align with the older part of the wall. So that the simple trefoil and the nail-head ornament are but examples—not infrequent in Scottish architecture—of the way in which old material is turned over and put to fresh use.

The vaulting of the chapels to the south of the ritual choir is on the same principle as that of the south aisle, but the ribs are slightly heavier, and appear later; and it looks as if there had been a reconstruction of this part of the work along with the flying buttresses, and perhaps even at the same time as the actual vaulting of the ritual choir. The westmost of the three buttresses remaining, that is, the one opposite the rood and which carries the Madonna, looks as if it had been first erected to sustain the arch thrown across at this point. The curve of its lower section is different and the slope of the buttress much more horizontal than the rest, although each varies. The two buttresses of the chapels to the east look as if they had been built from above the level of the chapel eaves at a later period, and that the lower pinnacle of the westmost buttress had been at the same time crowned with a pinnacle of the same design and the same height, reaching, however, a higher level, on account of the different position of the flying buttress. These pinnacles

agree in character with the work on the south transept gable, and are probably of the same period.

In this south front of the transept, the architects of the abbey attain the highest degree of perfection which the work can show. It may not be finer nor bolder than the work of the ritual choir, north transept, and cloisters, but it is stranger, more personal, and more exquisitely polished. It is generally said that the date is fixed by a boss in the vaulting, bearing the Hunter arms, Andrew Hunter, confessor to James II., having been abbot at the middle of the fifteenth century, down to about 1460. But only the vaulting is fixed by this fact, and it appears more than probable that the south front was either a reconstruction or followed on the vaulting of this part, the date of which is fixed by the arms of Abbot Hunter. Certainly, there are late features in the doorway, the window itself, and especially the upper parts of the gable, which point to a date of about 1470-1480. The base moulding of the respond adjoining the south transept wall, indicates by its whole design a later date than that of the pier opposite, and is further testimony to the fact that the gable followed the erection of the arcade. In order partly to explain these late features, the doorway has been generally regarded as an insertion, but there is no conclusive evidence of this, and a careful examination points in the other direction. The checking out of stones characterises the whole of the building, and the splaying back of the surfaces at this point is evidently the setting right of a mason's blunder, and an interesting illustration of the carelessness of the architects in non-essentials. The jamb of the door is substantially the same

moulding as that of the window over, which is capped in a very late fashion, and the very delicate mouldings of the tracery themselves indicate a late period, although the general design of the window is a combination of curvilinear and geometric forms, and in England would almost be sufficient to date this part of the building more than a century earlier than the period now suggested. A further evidence of late date is supplied in the form of the label moulding suspended from the apex of the gable and drooping so as to form a tangent with the mouldings on the shoulder of arch. The grouping of the niches, the open tracery of the canopies and their miniature vaults and all the details combine to show that this is no example of English Decorated, but a work of revival, a personal endeavour, an essay in selective design. It is worth while remembering that Donatello and even Alberti were dead at the date we have fixed for this part of the work, and that Brunelleschi's life work had been completed thirty years, and it is not altogether surprising to find in Melrose, in view of the close connexion established with the Continent, so much of the same spirit in this beautiful work. The carving of the musicians, which form the ends of the hood mouldings of the corner chapel windows are most delightful examples of the Renaissance spirit, and vividly recall the work of Donatello at Padua; and the angelic choir which form a series of corbels under the parapet of the great south window on the interior show the same tendency. So do, if in lesser degree, the corbels under the niches bearing ribbons with the following inscriptions: "PASSUS E Q IPSE VOLUIT" and "CU VENIT JES SEQ CESSABIT UMBRA." In the panels over the door the statues of apostles are ranged in the following manner: (1) St. Andrew, distinguished by the cross, occupies the niche to the west side, and is pushed close to the inside of the panel, that the pinnacle of the buttress below may not hide him from view; (2) St. Peter with the keys; (3) a figure in a seated posture; (4) a blank space; (5) this, the central feature, is a shield bearing the Scottish lion rampant facing the sinister side of the shield; above it, forming the finial of the hood moulding, is a fine bearded head with the motto *Eccle filius Dei*, and of quite the same character as those on the buttresses adjoining, another circumstance pointing to their execution at the same time. This must represent John the Baptist. Beyond it to the right, the space is occupied by floral carving; and the next space by a kneeling figure. The next corbel is empty, but has been occupied till very recently by the figure of St. Paul; and the last by a figure placed to one side like the St. Andrew, with a book in his right hand, supported by a staff, perhaps intended for St. John the Evangelist. The arch of this doorway, like the earlier work in the ritual choir and cloisters, is very slightly segmental, forming a scarcely perceptible angle at the springing. Although there are some yellow stones in it, it is for the most part of a stone of the same colour and quality as the rest of the transept front, a pale reddish-purple stone of exquisite texture and considerable hardness, carrying a very fine arris; not a red stone, as is generally stated. In fact, the colours of the stone in Melrose Abbey, which was quarried at Bemersyde or Dryburgh, vary with the periods of architectural activity as much as the character of the design. In some parts, such as the choir, and here and there in the lower part of the south transept front, the stone is of a bluish purple, while red purple is the colour of the greater part of the south transept, and red the colour of some of the upper stones and those of some of the pinnacles and the later chapels. The period succeeding the erection of the south transept is marked generally by a yellowish grey stone.

It is clear that the stair turret, the chapel No. 8, or its reconstruction with the buttress and niche adjoining, are of the same period as the south transept gable. The niche in the buttress distinguishes it from the buttresses to the west, which have corbels and canopies only, and the stone in which it is built and the details of the work show that it is part of the work of this period. Turning to the interior of the transept, therefore, we have no hesitation in ascribing the door to this turret as of the same time, and the matter is of some importance, since its lintel bears a very interesting inscription, the date of which does not appear. Much of it has now wasted away, but from numerous writings it can be recovered without doubt,

With its interpretation we are not at present concerned; suffice it to say that each writer on the subject has one of his own. Though frequently quoted, its relation to a still more apposite inscription demands its reproduction here:—

SA YE	SUA
CUMPA	TROUTH
GAYS	AND
EYVN ABOU TE	LAUTE. DO BU DUTE
BE HALDE TO YEHENDE	Q'
	JOHN
	MORVO

Between the two columns of this legend is a square foiled panel with a shield bearing mason's compasses crossed, and fleur de lis, now scarcely recognisable. The other inscription, which adjoins it, is obviously an inserted panel, and thus of somewhat later date. This one, too, has largely disappeared, and the version here adopted is the very careful reconstruction of Mr. P. McGregor Chalmers in "A Scots Medieval Architect," substantiated, as far as may be now, by means of a photograph taken for the purpose, and punctuated so as to bring out the rhymed form:—

JOHN MORVO SUM TYM CALLIT
WAS I, AND BORN IN PARYSSE
CERTAINLY, AND HAD IN KEEPING
AL MASOUN WERK, OF SANTAN
DROYS YE HYE KYRK, OF GLAS
GW MELROS AND PASLAY, OF
NYDDYSAYLL AND OF GALWAY,
I PRAY TO GOD AND MARI BATH,
AND SWEET S. JOHN KEP THIS HALY
KYRK FRA SKAITH.

St. Andrew, the metropolitan see, is, of course, the "hye kyrk" referred to; the others are plain enough, save *Nithsdale and Galloway*, where there are the beautiful abbeys of Lincluden, Sweethearts, and Dundrennan, besides Glenluce, a colony of Melrose. As some explanation of the extraordinary trinity to which supplication is made, it should be remembered that the abbey is St. Mary's, and that, as the author referred to points out, the chapel directly opposite (No. 9 on plan) is probably that of St. John, so that the allusion on the part of John Morvo is doubly appropriate. This would also tend to confirm the attribution of St. John to the figure which stands close to the east side of the door adjoining. In the lower church of "Glasgow," the St. John's chapel occupies the south-east corner; and in Worcester, and possibly other cathedrals, it occupies this very place in the transept. But in this event, the female figure, which still stands on a bracket to the north side of the east window, requires to be explained away. Chapel No. 10 is believed by Mr. Chalmers to be St. Andrew's Chapel, and he thinks that the short figure of St. Andrew has been removed from before it to the pinnacle of the flying buttress. This is the arrangement at Gloucester Cathedral, where St. Paul's and St. Andrew's chapels are arranged at each side of the presbytery aisles in the transept.

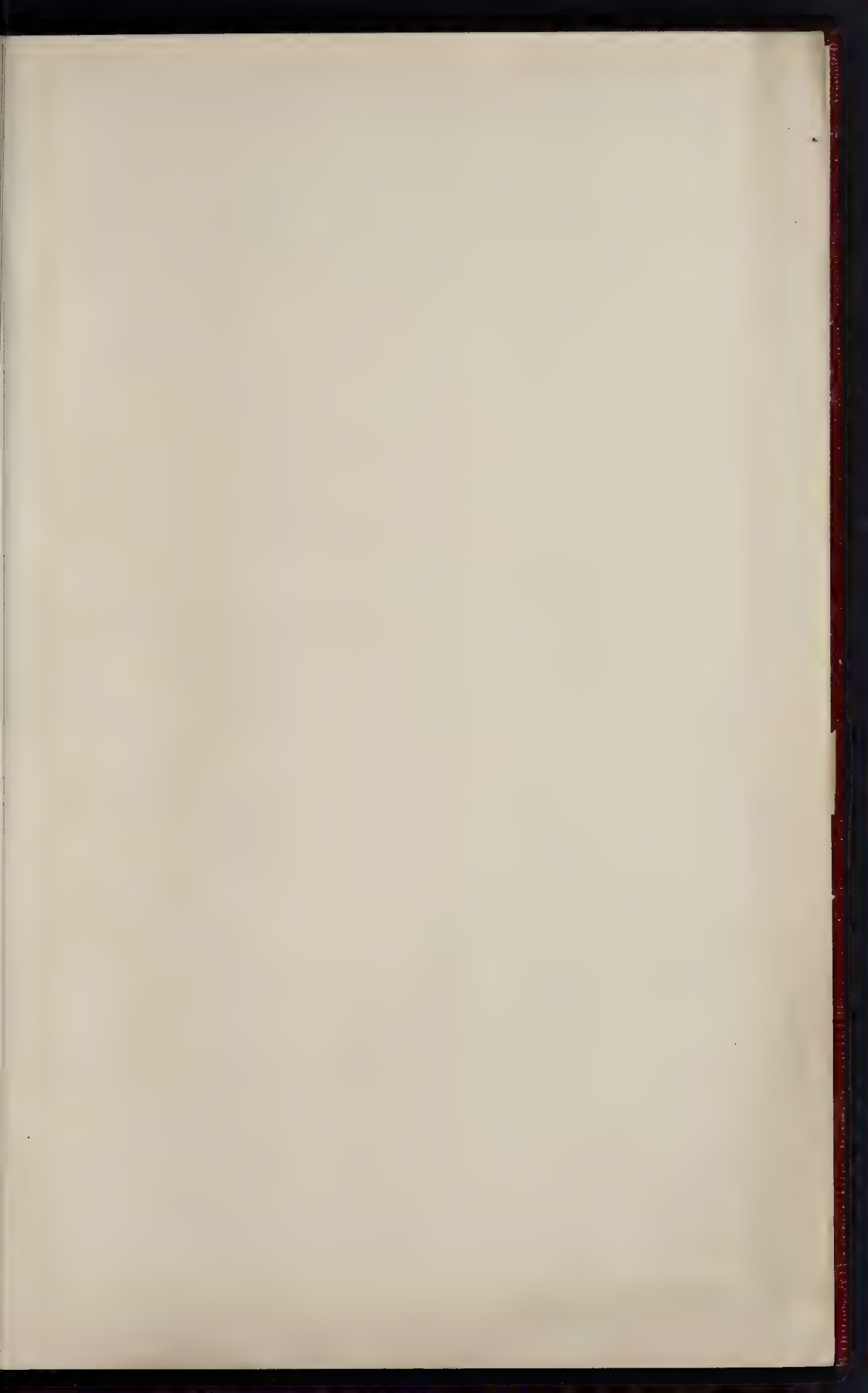
In spite of the difference in the dialect, and the insertion of the latter panel, several writers have concluded that the inscriptions are the work of one individual, and this conclusion is not unnatural in view of their similar general character and the close resemblance of the names. Mr. Frederick Pinches, in his book of drawings of the Abbey (1879), appearing to quote another writer, although the text is not clear, says that they "can hardly be any earlier date than the beginning of the sixteenth century, both from the form of the letters and from the simple fact of their being in English, as every one knows that English inscriptions were not used before that time"; and he concludes on his own part that "he may fairly be considered as the architect for this part of the church." So far from English coming into use for inscriptions in the sixteenth century, there is one in English dating from 1370, at Brightwell-Baldwin, Oxfordshire, and another at Wanley, Leicestershire, of date 1393, and in the fifteenth century they are very numerous. Saxon was, of course, the spoken language of the South of Scotland at this period, with the exception of Galloway, which was a Celtic province, and the abbots were English colonies. Most of the benefactors of this abbey, with the exception of the Lords of Galloway and the Earls of Dunbar, were of Norman race, and there were

thus substantially the same conditions of race and language as across the border. A comparison with English inscriptions leads one to believe that the date already proposed for the south transept front is the approximate date of the first inscription; but the other one is better paralleled by epitaphs of the date 1540-42. From all these circumstances, and in view of the changed character of the lettering, it is more than likely that a considerable interval exists between the two inscriptions, and that they refer to different persons, perhaps of the same family, both of whom may have been master masons, overseers, or architects for part of the work, and it is highly probable that the first inscription is that of the architect of the south transept front. In a Gothic church the second inscription is unique and is in itself additional evidence of its sixteenth-century date and of the new spirit of Humanism which, like "a breeze through all the garden," was sweeping over the monasticism and feudalism of the middle world.

In considering the second inscription along with the first we have travelled beyond the period of the erection of the transept itself, and are brought back by a shield having Abbot Hunter's arms, on the buttress between 3 and 4 chapels, which marks this part of the work as likely to have been his. This buttress marks the beginning of a new series, which are double-stepped instead of single-stepped, and have corbels of a different design; and the window mouldings change with chapel 4 to a finer and later section, which, in the mullions, at least, is akin to those of the great south windows. The window of No. 4 chapel may have occupied a central place in its design, standing out as different from those on either hand, which repeat one another. The buttress between Nos. 3 and 4 chapels on its corbel carries a rebus of a mason's "mell" [mallet] and a rose. The vaulting to the west of the chapel marked 1 on plan indicates that at least another chapel existed beyond it. The buttress between these chapels is remarkable for a very large and beautiful panel of the Royal arms of Scotland: the lion rampant on a shield surmounted by a crown, and borne by two large unicorns. The date is plainly inscribed, Anno Dni 1505.

This brings one down to the reign of James IV. of Scotland, but prior to this date very large reconstructions and additions had been made to the eastern end of the Abbey. Probably as far back as Abbot Hunter's time (circa 1460) the piers adjoining the eastern tower piers (which have later capitals than the rest) had been put in and the vaulting completed, at least up to the line of the eastern side of the tower. But about 1500 a large addition and partial reconstruction of nearly the whole east front was undertaken, and the way in which this has been dovetailed into the existing work is one of the most puzzling features of a singularly interesting problem. But more singular than this effacement of structural evidence, or indication of any earlier sanctuary, is the manner in which it has been designed. It will be gathered from what has been already said that no such phase as Perpendicular became a living style in Scotland. Isolated examples of Perpendicular window tracery exist: three windows at Linlithgow, and one at Stirling Church (of date 1507-20), but Melrose presents the grand exception. The gable of the sanctuary has been designed in keeping with that of the transept, but the window sill is lower, and its arch rises higher, and the "poplars straight" of its tracery give added effect of height. The design of the window-head is a very beautiful one, and, it is believed, unique; a repeating diamond figure, delicately cusped, braced by horizontal transoms, and supported from above and below by an intermediate mullion. In other respects the gable is an echo of the south transept, but the space formed by the festooned hood moulding, which in the south transept is believed to have enshrined a Christ, is occupied to this day by the figures of a king and queen. The king is seated, with the queen on his right hand; both are crowned, while the king holds in his left hand a globe, and with his right grasps a sceptre. These figures are nearly always described as David I. and Matilda, a scarcely credible blunder, since dim tracts of nigh four hundred years time separate that "sair sanct for the crown" from the period of this style of architecture. Mr. Pinches is on surer ground when he suggests James IV. and his bride, Margaret Tudor, by whose union the crowns of the two countries afterwards came to

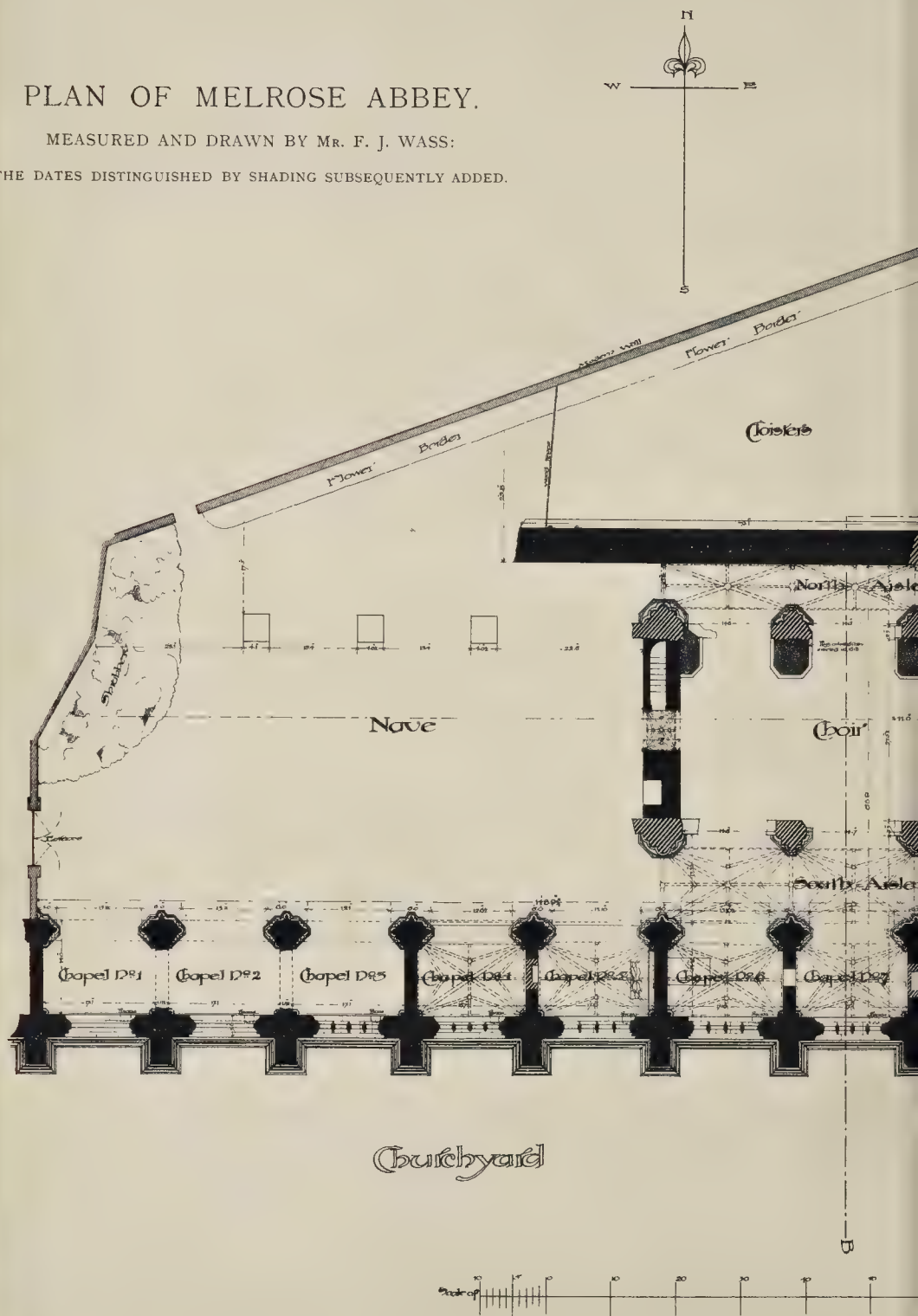


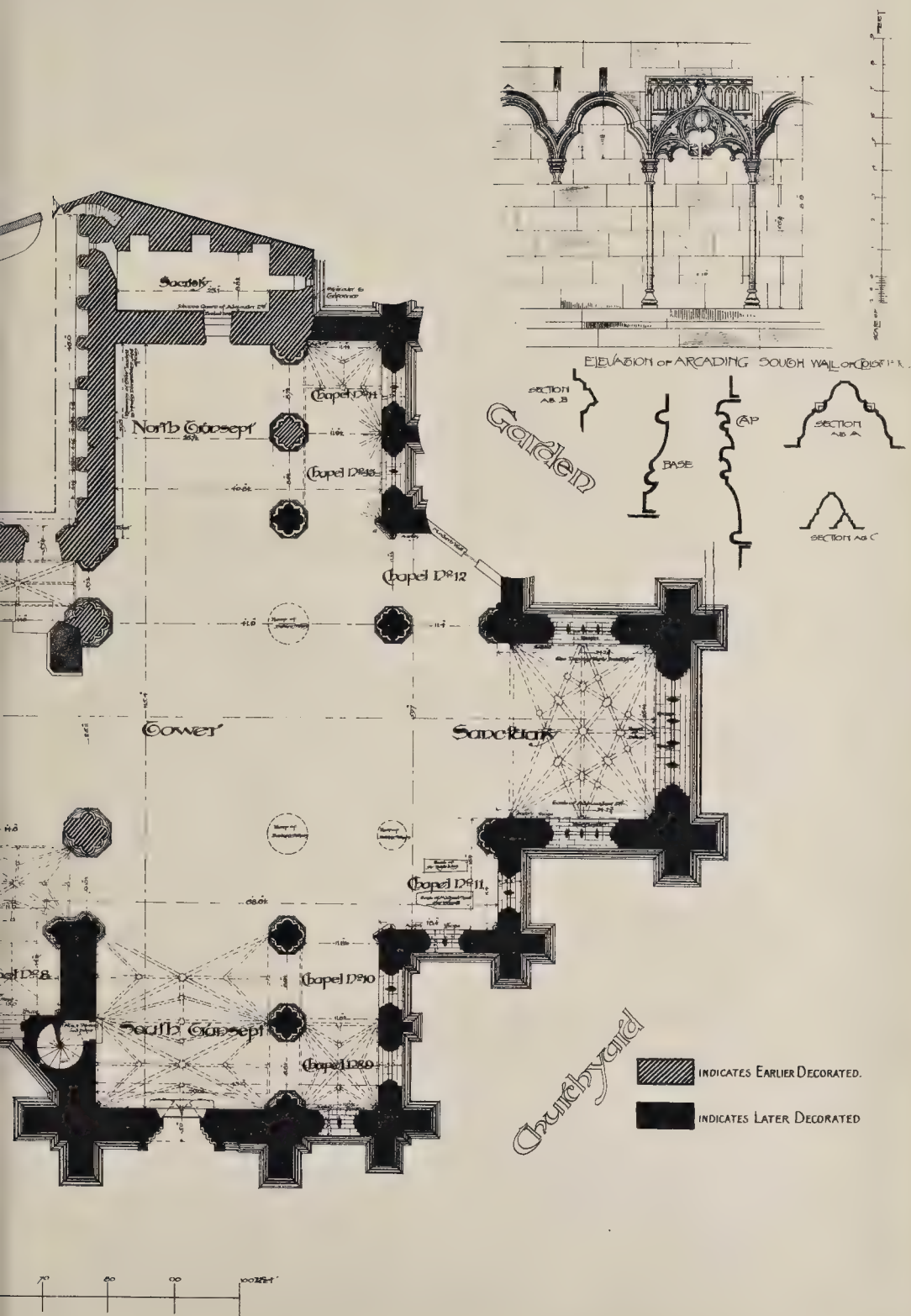


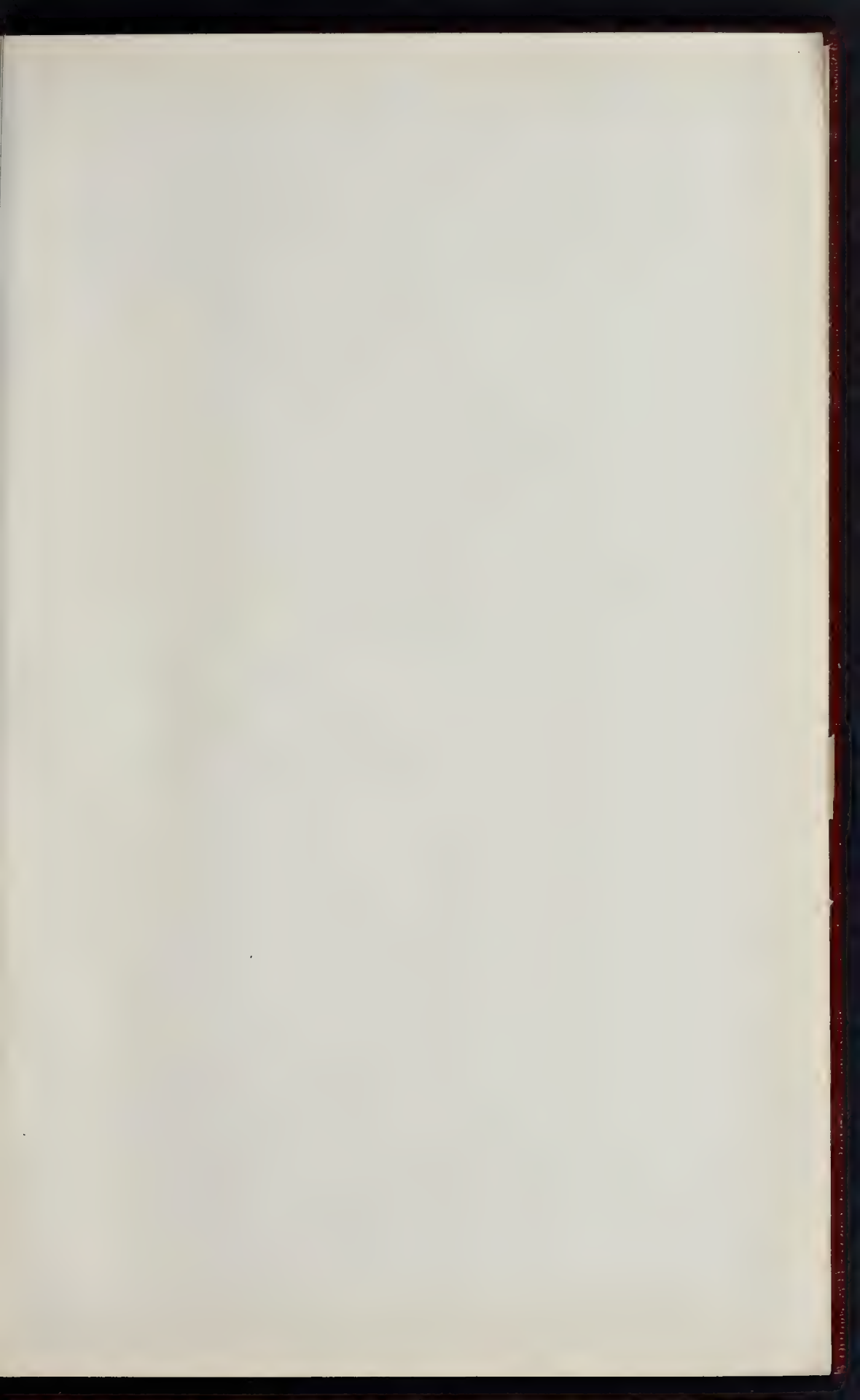
PLAN OF MELROSE ABBEY.

MEASURED AND DRAWN BY MR. F. J. WASS:

THE DATES DISTINGUISHED BY SHADING SUBSEQUENTLY ADDED.





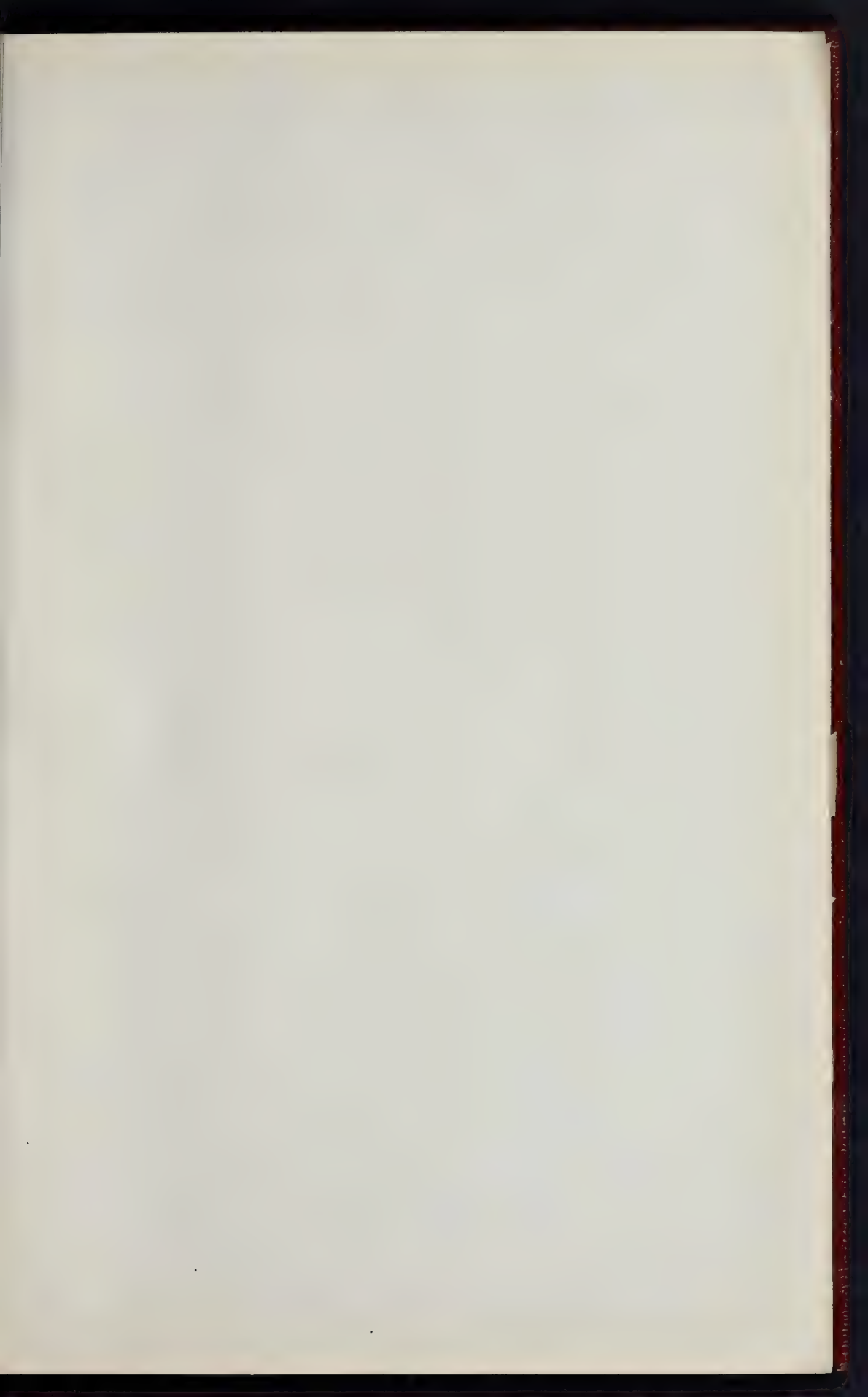




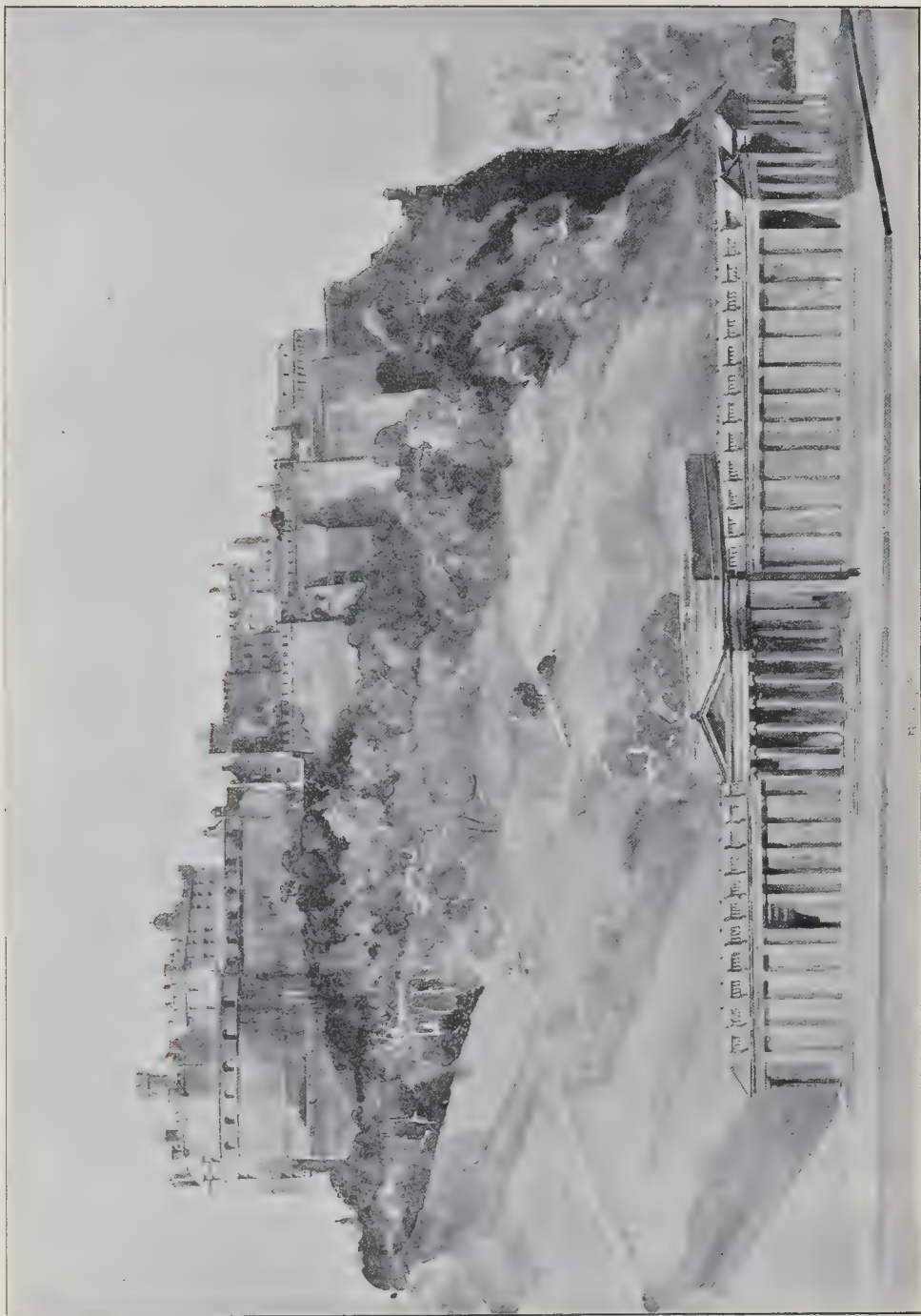
GENERAL VIEW OF EDINBURGH, FROM



CALTON HILL. DRAWN BY MR. W. MONK.



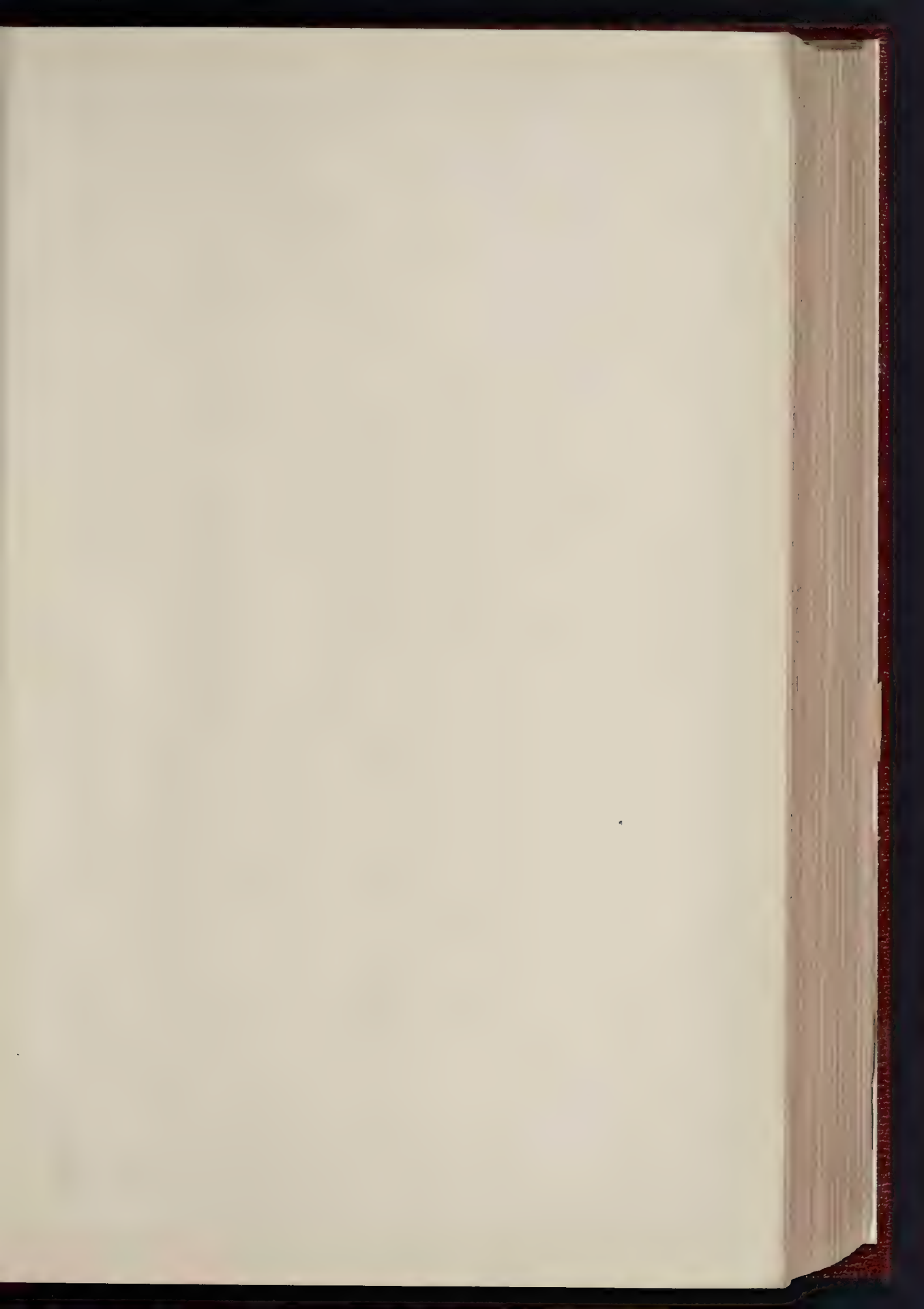
THE BUILDER, JANUARY 1, 1893.



THE CASTLE AND THE NATIONAL GALLERY.



THE CASTLE: FROM THE GRASSMARKET.
EDINBURGH ARCHITECTURE.



THE BUILDER, JANUARY 1, 1898



THE ROYAL INSTITUTION, 10, LEITH WALK, EDINBURGH.
From an original built in 1826 by James Craig.

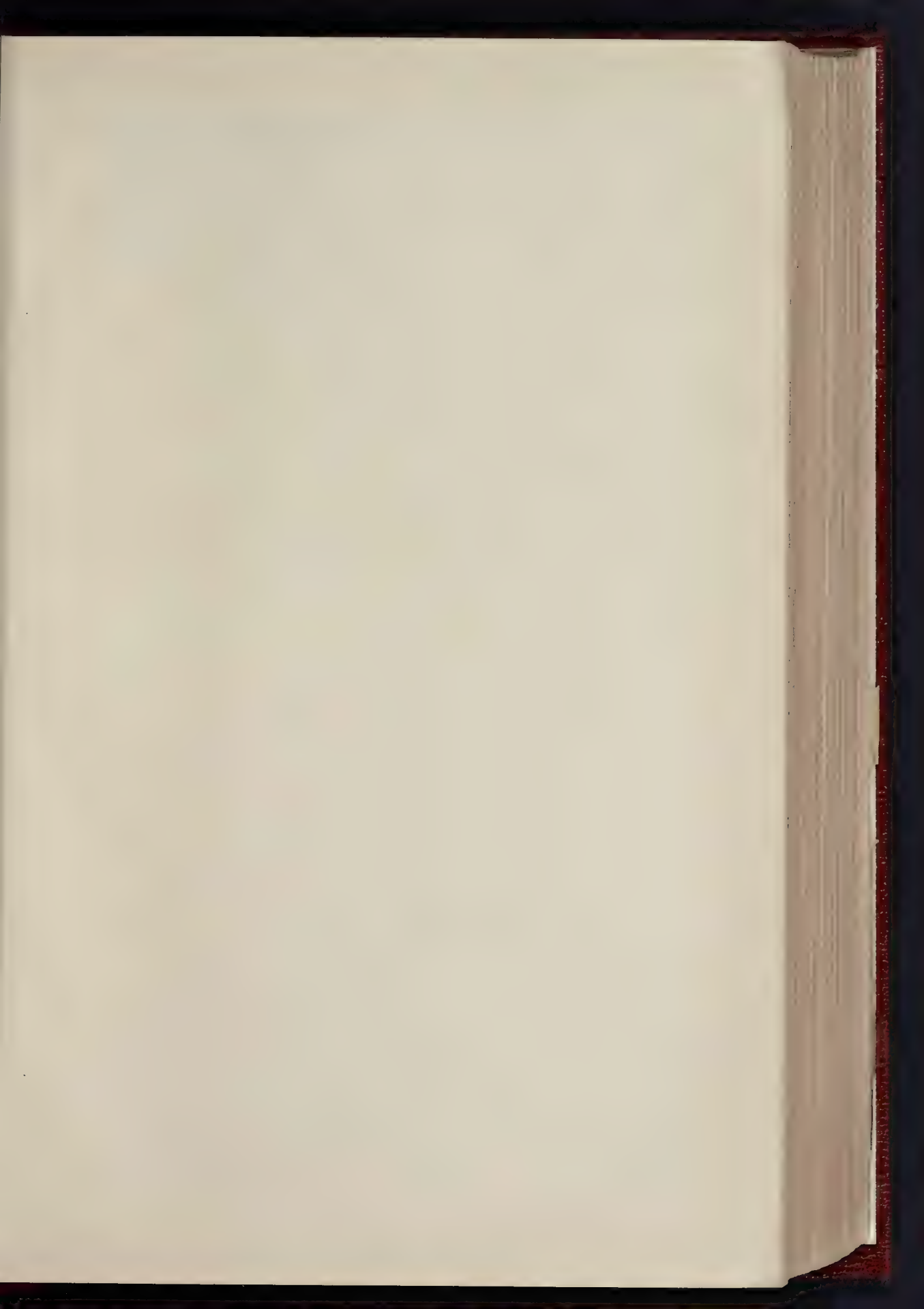
EDINBURGH ARCHITECTURE.



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THE SCOTT MONUMENT (THE LATE G. KEMP).
(From the original lithograph issued to subscribers.)

EDINBURGH ARCHITECTURE





BANK OF SCOTLAND (THE LATE MR. DAVID BROWN)
(From a water-colour by J. G. Macdonald)

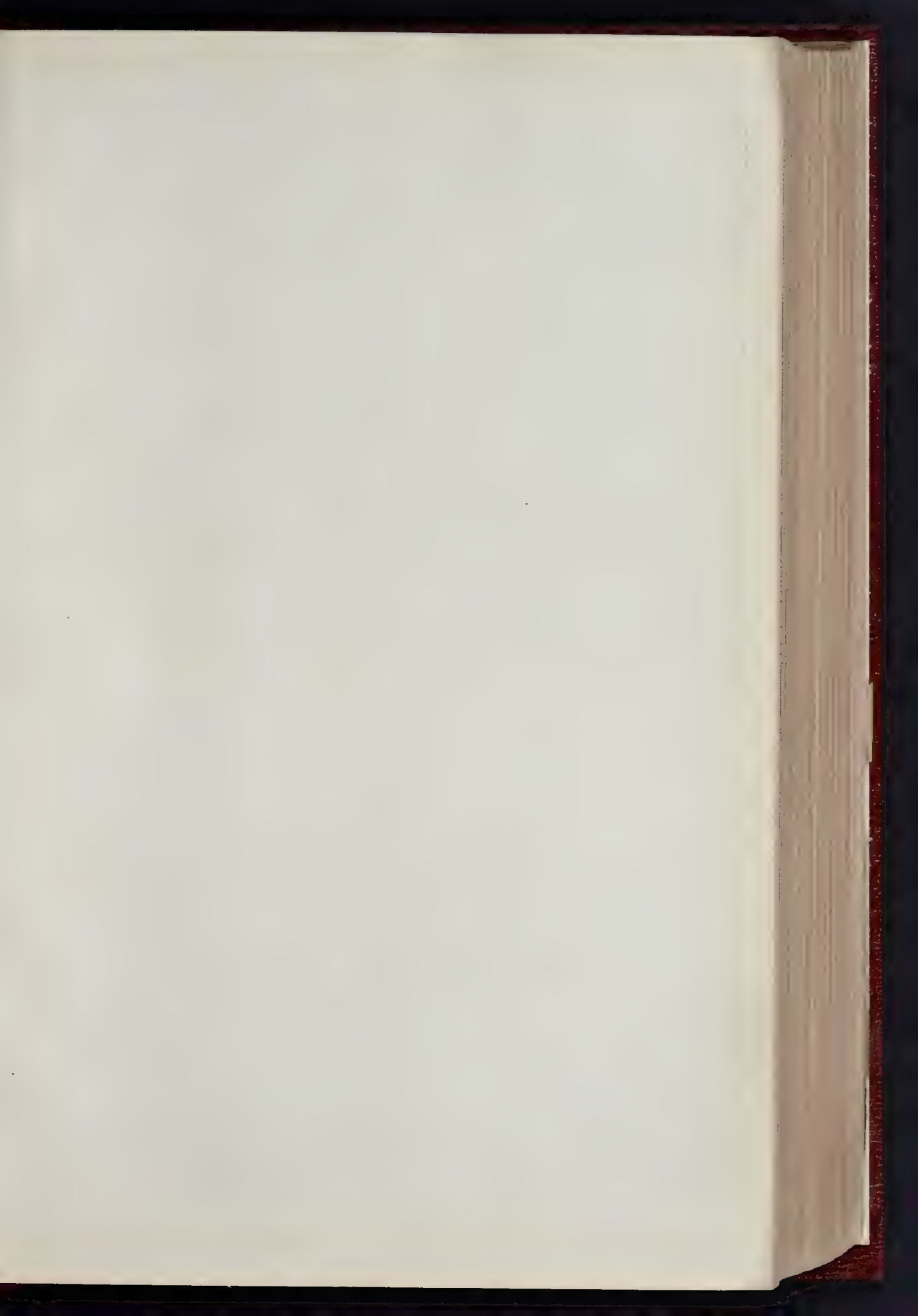


DONALDSON'S HOSPITAL (THE LATE WM. PLAYFAIR).
(From an original drawing.)



FREE CHURCH COLLEGE (THE LATE WM. PLAYFAIR).
(From an original drawing.)

EDINBURGH ARCHITECTURE.





VUE IN HIGH STREET.



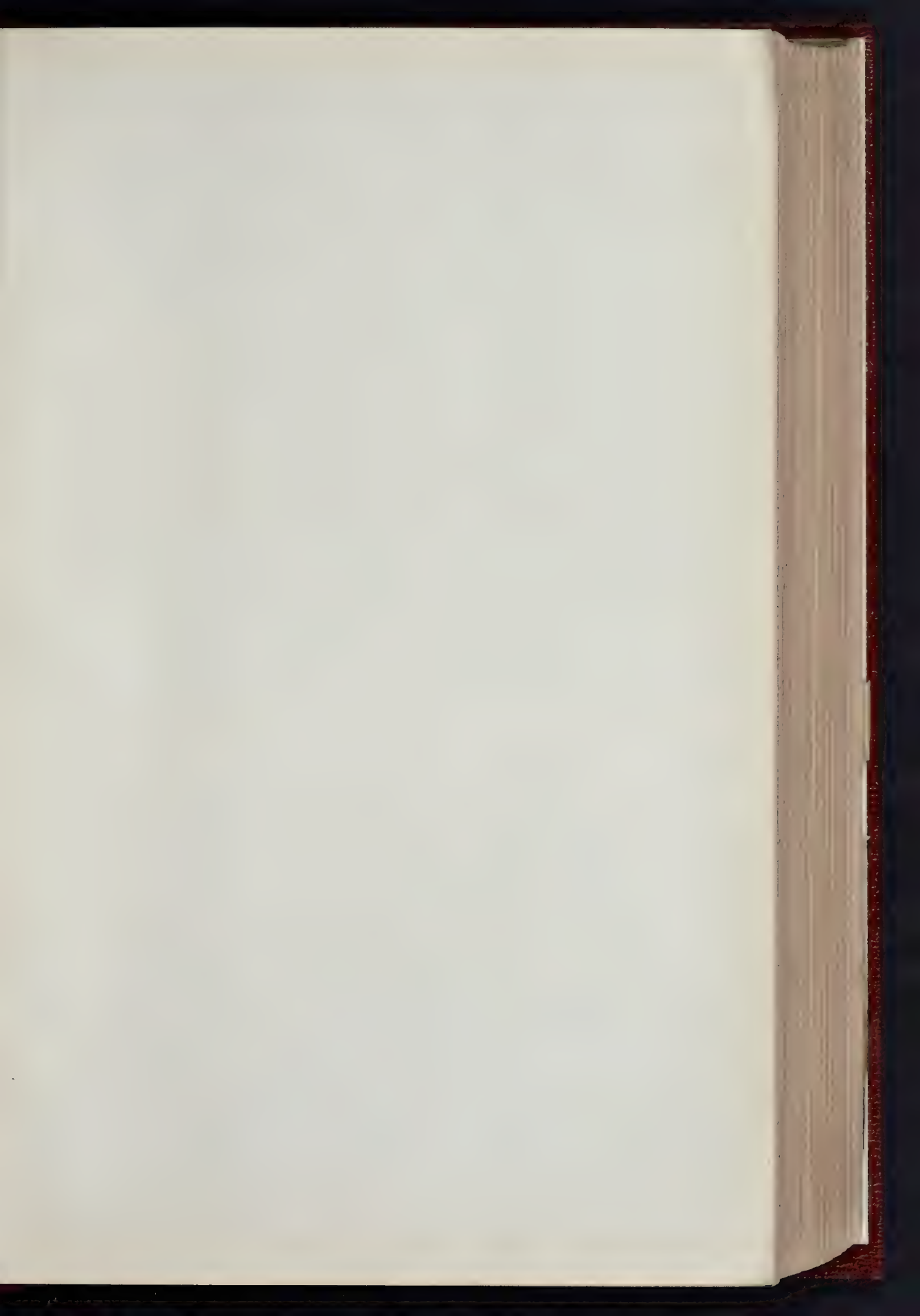
HERIOT'S HOSPITAL.



HOLYROOD PALACE.

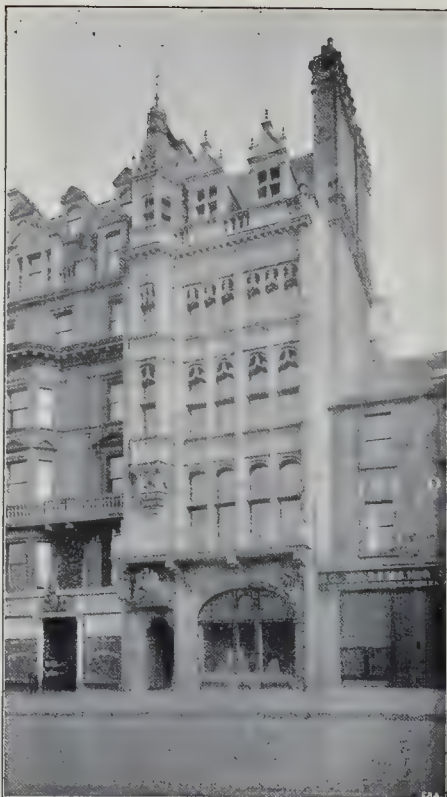


THE REGISTER HOUSE (R. ADAM).





PART OF FREE LIBRARY (MR. WASHINGTON BROWNE).



BUSINESS PREMISES, PRINCE'S STREET (MR. WASHINGTON BROWNE).



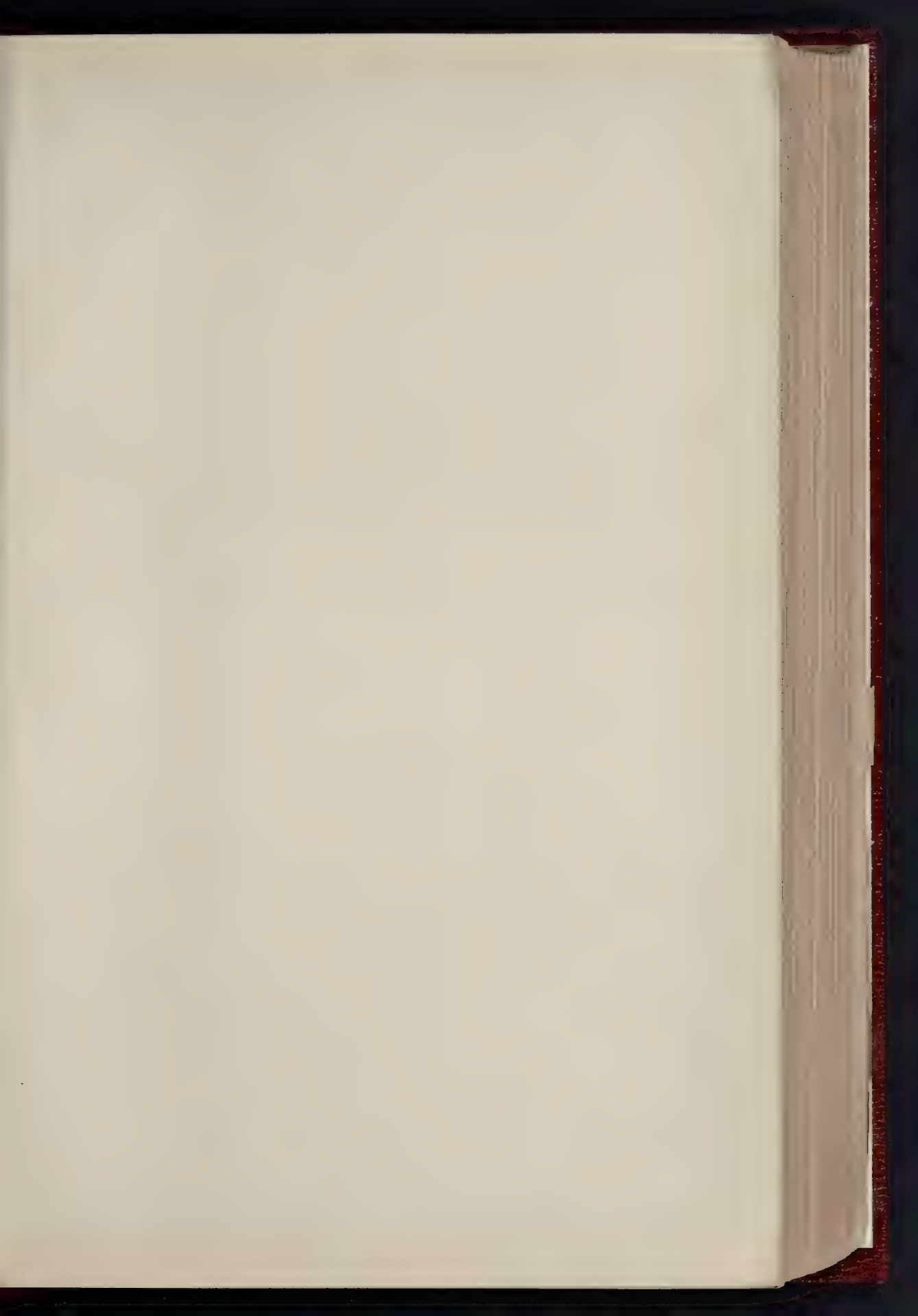
MEDICAL SCHOOL, NEW UNIVERSITY BUILDINGS (DR. ROWAND ANDERSON).



SCOTTISH WIDOWS' FUND (THE LATE MR. DAVID BRYCE).



LIFE ASSOCIATION OF SCOTLAND (THE LATE MR. DAVID RHIND).





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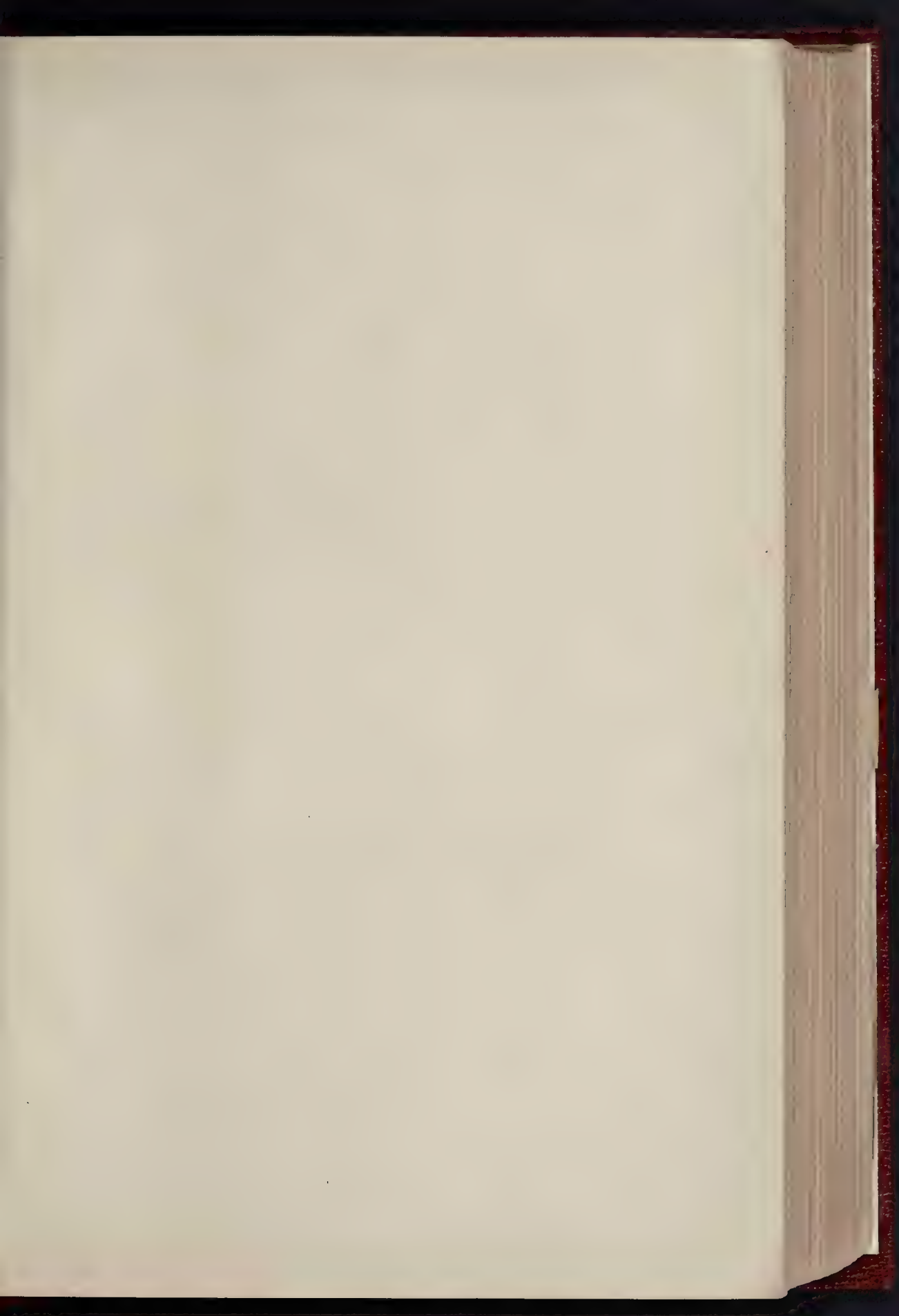
STEWARTS COLLEGE (THE LATE MR. DAVID RIGGS)

CHARLOTTE SQUARE: WEST ELEVATION AS DESIGNED
(From original drawing by R. ADAM, in the Soane Museum.)



PART OF QUADRANGLE, EDINBURGH UNIVERSITY (R. ADAM)

ONE PLANT: SCALE 1/4 IN. = 1 FT. CURVED WALL: 1/4 IN. = 1 FT. STAIR: 1/4 IN. = 1 FT.





THE NATIONAL PORTRAIT GALLERY (DR. ROWAND ANDERSON).



ST. MARY'S CATHEDRAL.



MC EWAN HALL (DR. ROWAND ANDERSON).



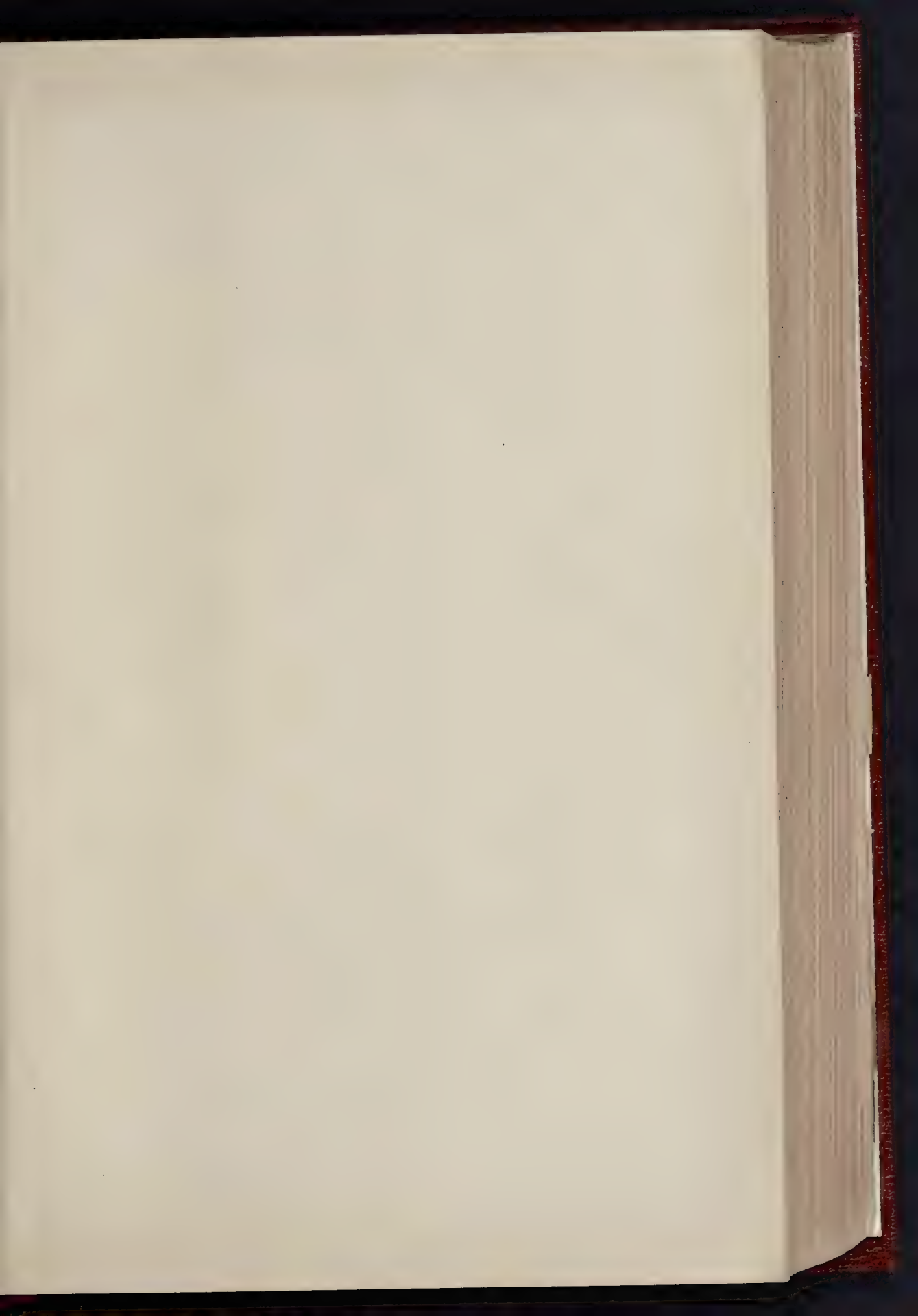
ATE SIR GILBERT SCOTT).

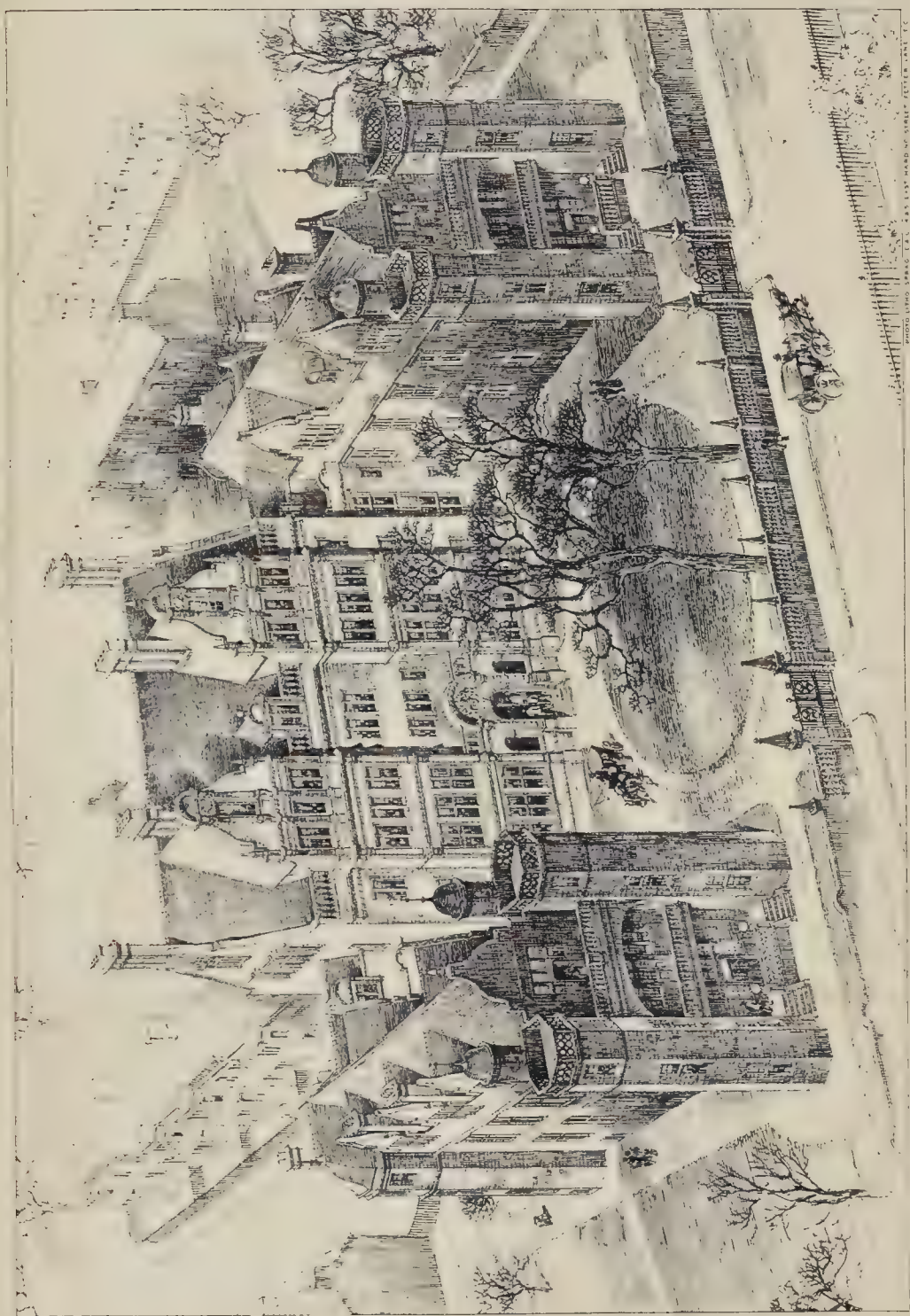


FREE CHURCH, MORNINGSIDE (DR. ROWAND ANDERSON).



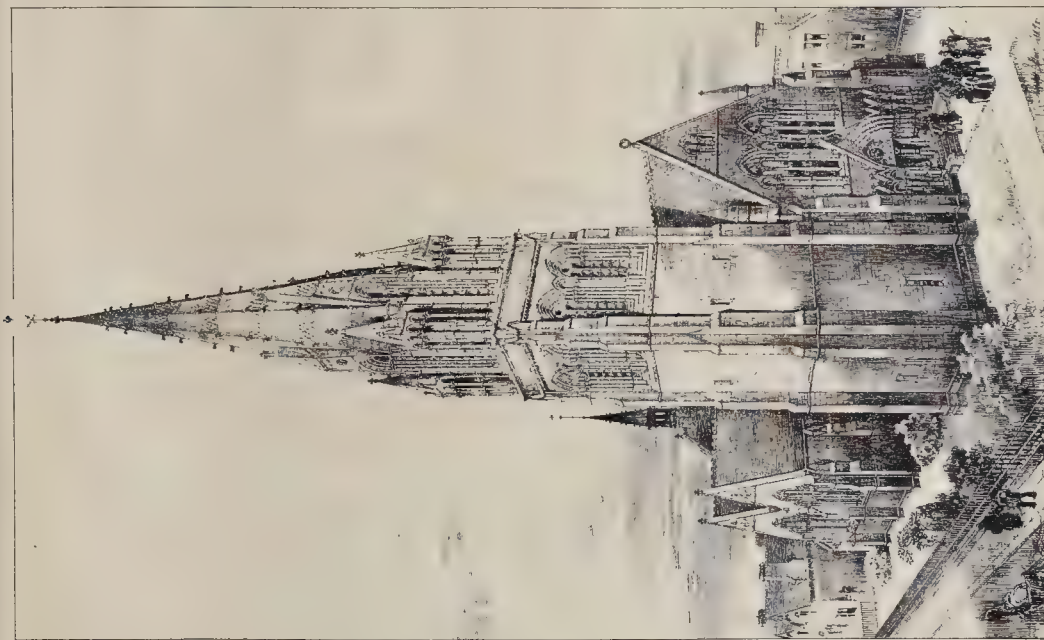
FETTES COLLGE (THE LATE MR. DAVID BRUCE)



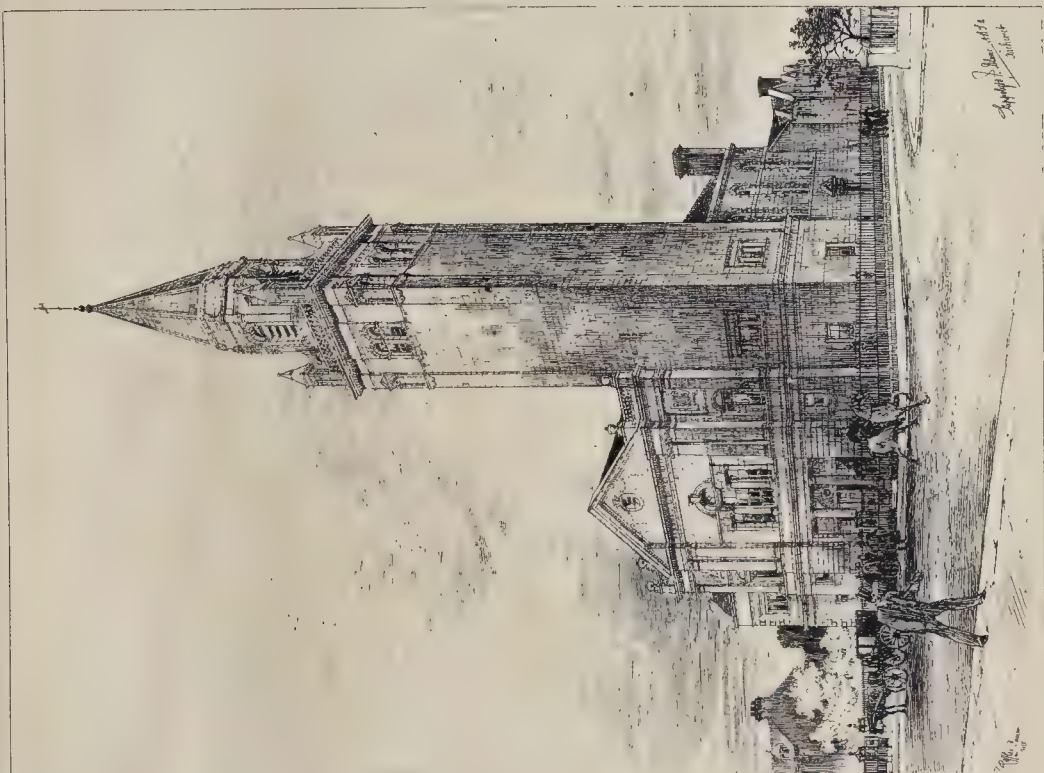


ROYAL HOSPITAL FOR SICK CHILDREN (MR. G. WASHINGTON BROWN)

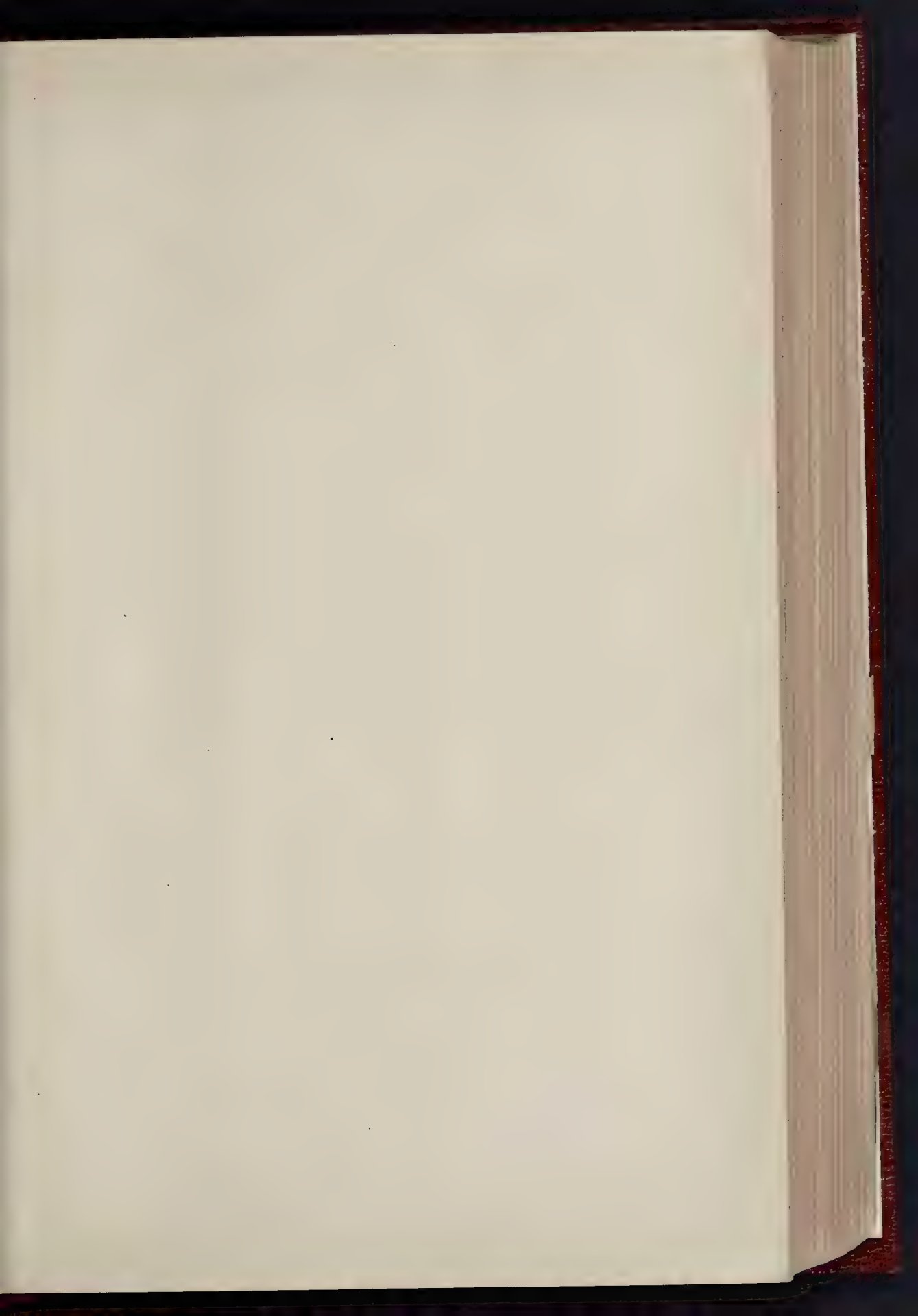
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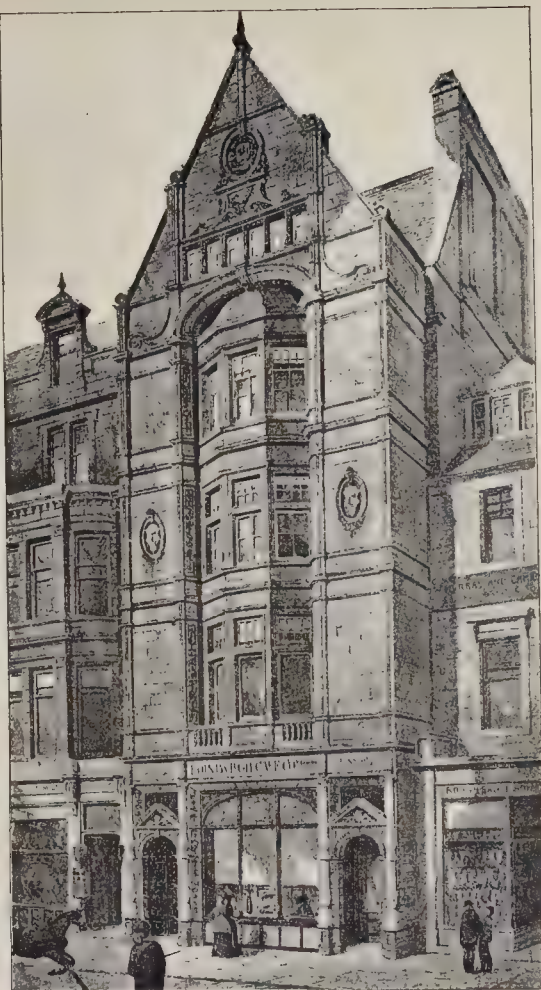
MORNINGSIDE FREE CHURCH (MR. HIPPOLYTE J. BENOIST)
EDINBURGH ARCHITECTURE





A BAKERY (MR. G. WASHINGTON BROWNE).

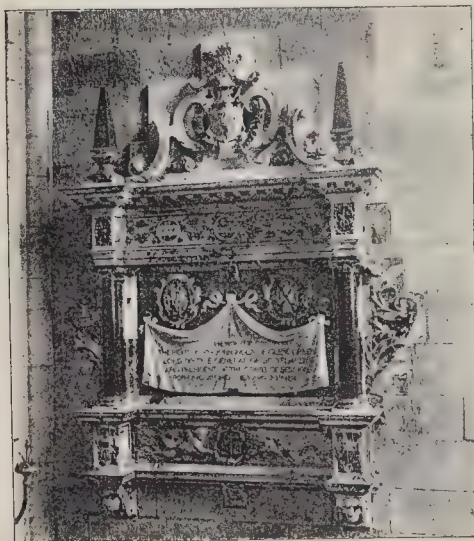
THE MONTROSE MONUMENT, ST. GILES CATHEDRAL
(DR. ROWARD ANDERSON).DETAIL OF BUSIN
(MR. G.)



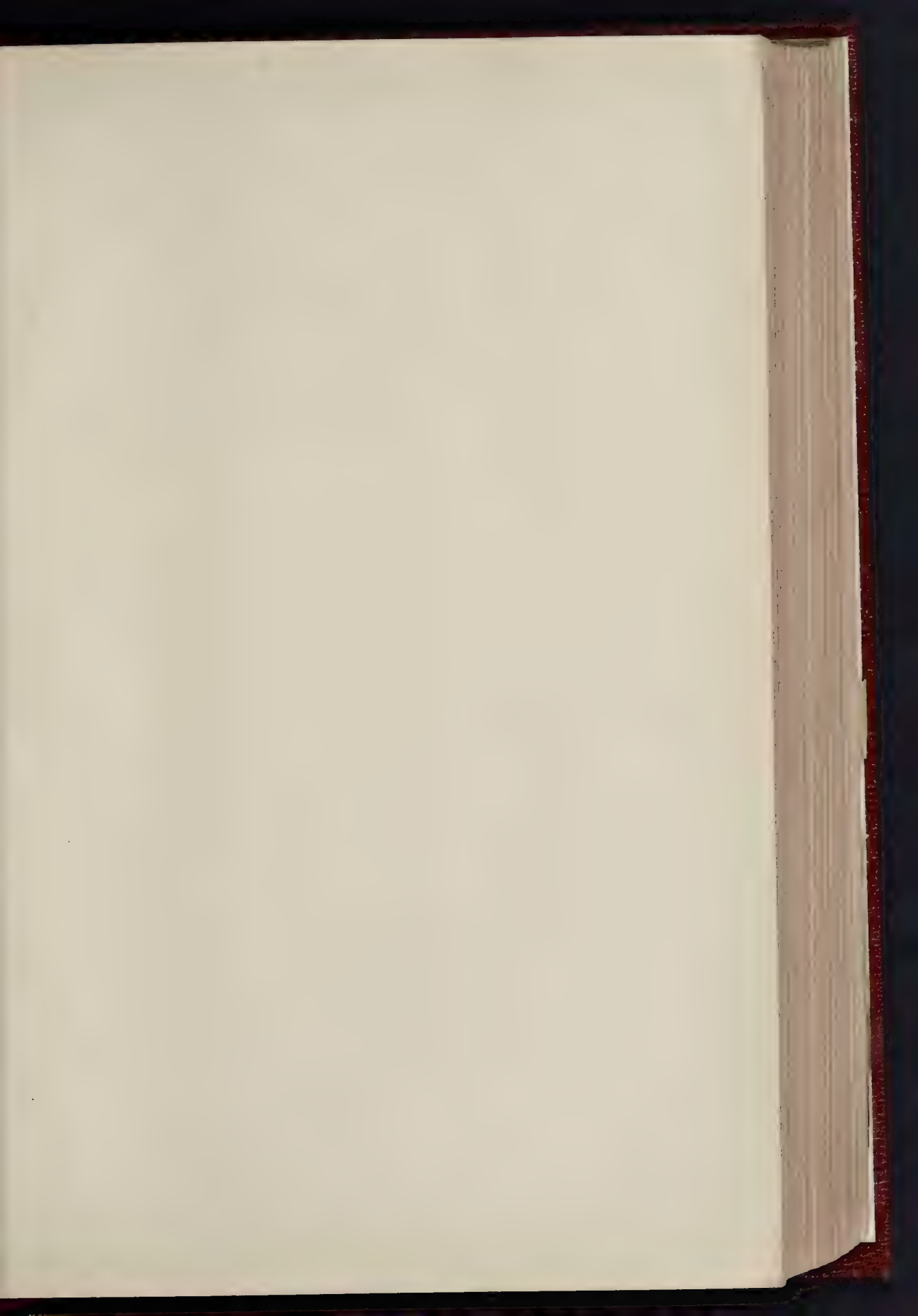
EDINBURGH CAFE (MR. HIPPOLYTE J. BLANC).



REMISES, PRINCES STREET
(MR. HINGTON BROWNE).



THE GLENCORSE MONUMENT, ST. GILES CATHEDRAL.
(DR. ROWAND ANDERSON).



Pardon-Church-Haugh.

St. John's Priory, Clerkenwell.

The Charterhouse

St. John's Gate

St. James's Priory,
Clerkenwell.

The "River of Wells."

Precinct of Ely Abbey.

Garden of Ely Place.

"Ely Place," London House of the Bishops of Ely

Chapel of St. Etheldreda.

Cloisters.

Smithfield St. Bartholomew the Great. Brotherhood of the Holy Trinity. St. Botolph. Aldersgate.
St. Bartholomew the Less.



Prior of Sempringham's
Town House.

Smithfield Pool.

"The Elms," Smithfield.

The Mitre Tavern.

Kitchen.

Colonnade, Ely House.

Solar Hall.

Stone Gate to
Ely Place, Holborn.

Ely House.

be united. Henry VII., her father, was strongly advised against this marriage, on the ground that the throne of England might come to James, but saw far enough to reply that, in any event, Scotland would be an accession to the English dominions and not England to Scotland, and perhaps in the architecture of this part of the Abbey we have the earliest indication of the English ascendancy. It is recorded that in 1502 Margaret made a triumphal progress through Scotland, and the feeling of security now established may have given the convent community confidence in the prosecution of the task to which they certainly set themselves about this time. This is the work which, according to the theory promulgated in "A Scots Mediæval Architect," the John Morow of the later inscription may be supposed to have "had in keeping" at Melrose.

As it now stands, the whole ritual choir assumes the form of a Greek cross of three bays each way and with east and west arms of equal length; and the designer of the east window, or those who succeeded him, were not content with less than the complete transformation to a Perpendicular style of nearly the whole east front of the Abbey: other indications of the desire for symmetry and unity which marks the period, independent altogether of style. The Perpendicular clearestory windows at the internal angle formed by the sanctuary, extending two bays upon it (one of which appears in the drawing), and one upon each of the transepts, seem to have been built with the eastern end of the chancel, and, from indications left, they appear to have been alike. But the exterior plane of the clearestory window of the transept has been altered to present the appearance of a series of squat perpendicular windows of crude rectangular design, detracting, it must be confessed, from the great beauty and dignity of all the rest of the work. That these clearestory windows should be reconstructed, it appears to have been thought necessary to take down the former flying buttresses and substitute new ones, and the very thin flying buttress existing over the south-east chapel is superimposed upon two springers apparently of earlier date. Each of these is simply played on the inner face, where they would be concealed, and moulded on the outer, but the topmost one is moulded on both sides. The intermediate one looks the earliest of the three and is possibly a stone from the original Decorated work or from that of Abbot Hunter's time.

It should be noticed that the north window in the easternmost bay of the presbytery and the windows of the eastern aisle of north transept and north-east chapel are, or have been, of Decorated and not Perpendicular design; so that the Perpendicular tracery is strictly limited to that which would bulk in a south-east view of the abbey, such as is presented in Mr. McGibbon's perspective drawing. A fine open parapet adorned the low-pitched gable of both transept and chancel, as well as the aisles of the latter; but of this only the vestiges remain. The fall of the tower has caused great havoc in the central part of the structure, and the west wall only of the tower now remains, in parlous case. The present shattered condition of the edifice is generally attributed to the incursion of the English under the Earl of Hertford in 1545, who laid waste the whole district and destroyed others of the Border abbays.

The charters and writs of the abbey lie in the archives of the Earl of Morton, and were published in the original abbreviated Latin, with engravings of the seals, &c., for the Bannatyne Club, in 1837. Two compilations made at an earlier date rest severally in the Advocates' Library, Edinburgh, and the British Museum. There is also the "Chronica de Mailross," published in the same way, together making up the finest collection of ancient Scottish writs, with very numerous Royal Charters from the time of David I. to Robert the Bruce. The "Chronica" refers to the Abbey of Auld Melrose, which was some two miles and a half down Tweed. Properly worked, these muniments might yet prove a mine of information regarding the history of the buildings, and, as already hinted, much remains to be done in the church itself. For the records could but fill in the lights and shadows of a history which may be sketched in outline from the changing characteristics of the architecture with a confidence as well founded as it might be on "lettered stone" or illuminated scroll.

W. J. ANDERSON.

ILLUSTRATIONS OF EDINBURGH ARCHITECTURE.

THE illustrations given in the plates devoted to Edinburgh architecture are all referred to in the leading article, dealing with the subject, in this issue; it is only necessary here to summarise the contents of the plates.

We commence with a general view of Edinburgh from the Calton Hill, drawn by Mr. W. Monk, and we think our readers will quite concur with us in the opinion that as a combination of effect with careful detail in a large view, this is a drawing of no ordinary ability. Mr. Monk has also drawn the two views of Edinburgh Castle from two different points, one of them introducing Playfair's National Gallery as a foreground object.

The other illustrations are the Royal Institution (Playfair) from an old water-colour drawing; the Scott Monument (Kemp), from an old lithograph of the design made before it was built; the Bank of Scotland (the late David Bryce), from a water-colour lent us by the representatives of the architect; Donaldson's Hospital and the Free Church College (Playfair), from old drawings; a sheet containing views of High-street, Holyrood, Heriot's Hospital, and the Register House (from photographs); a sheet containing the Free Library (Mr. Washington Browne), the Medical School (Dr. Rowand Anderson), the Scottish Widows' Fund (David Bryce), and the Life Association building (the late Mr. David Rhind); a sheet containing a reproduction of Adam's original elevation for the west side of Charlotte-square (in the Soane Museum), Stewart's College (David Rhind), and part of the quadrangle of the University (Adam and Playfair)—the two last from photographs; sheet containing the National Portrait Gallery (Dr. Anderson), St. Mary's Cathedral (late Sir G. Scott), Free Church, Morningside (Dr. Anderson), McEwan Hall (Dr. Anderson), and Fettes College (David Bryce)—all from photographs except the last, which is from a drawing; the Royal Hospital for Sick Children (Mr. Washington Browne) and Mayfield Free Church (Mr. Blanc), and another Free Church at Morningside (same architect)—from drawings lent by the architects; and lastly a sheet containing illustrations of a Bakery in Torphichen-street (Mr. Washington Browne), the Edinburgh Café, Princes-street (Mr. Blanc), detail of business premises, Princes-street (Mr. Washington Browne), and the Montrose and Glencorse Monuments in St. Giles's Cathedral (Dr. Anderson)—the two first from drawings lent by the architects, the three latter from photographs.

A MONASTIC SUBURB OF OLD LONDON IN THE SIXTEENTH CENTURY.

THAT portion of Mediæval London contained within the boundaries consisting of Aldersgate-street Without, on the east; Holborn and a portion of the City wall, adjoining Aldersgate, on the south; and the extensive buildings and vast gardens of Ely-place, on the west, and Clerkenwell on the north, may certainly be regarded as a monastic suburb, for upon this space stood the noble Priory of St. Bartholomew the Great, the Priory and Hospital of St. Bartholomew, the hall and chapel of the Confraternity of the Holy Trinity, the Charterhouse or Carthusian Priory, Pardon Church Haugh, the Priory of St. John, Clerkenwell, the Priory of St. James, Clerkenwell, the monastic estate of the monks of Ely (Saffron Hill), the house of the Abbots of Sempringham at Cow Cross, and the town residences of other monastic superiors. The centre of the space was occupied by Smithfield, which, in early times, was a place for jousts, tournaments, pageants, fairs, and probably a cattle market also; it was not until later times that it gained a horrible notoriety; it was originally a pleasant place resorted to for recreation, with a lake or pool and a walk shaded by noble elms.

Considerable remains of ancient monastic and ecclesiastical edifices still exist in this neighbourhood. Every one knows the beautiful and interesting Church of St. Bartholomew the Great; the noble Norman choir and aisles, a small portion of the transepts, the first bay of the Early English nave, and the Lady Chapel, still exist. The writer remembers considerable remains of the monastic buildings—a part of an elaborate Perpendicular cloister, and a large crypt, which formed originally the great ambulatory beneath the dormitory, the

latter of bold but plain Early English work. Old engravings show that down to the end of the last century large portions of the monastery were in existence. Of the Priory of St. Bartholomew the Less, a cotemporary foundation with the more important building, nothing now exists except the tower of the church and some old monumental inscriptions. Views of the old church show it to have been an edifice of small proportions, consisting of a nave with a north aisle and western tower; the gate was to the north, and the cloister to the south. The chapel and hall of the Confraternity of the Holy Trinity were in existence at the middle of the last century, and old engravings show the hall to have been a noble structure, not unlike Westminster Hall, with a magnificent hammer-beam roof, and large windows at the east and west ends; at one time it was used as a Presbyterian Chapel. Of the old chapel I have not been able to discover any drawings, but it is shown in plans and maps; it was smaller than the hall, and stood to the west of it; close by was Aldersgate Church (St. Botolph), old engravings show it to have consisted of a nave and aisles of the same height and width, with a western tower of low proportions, with an angle stair turret and bell cot.

The "Charterhouse" is a very perfect example of a small monastic building handed down to our time. Here, probably, no portion of the building dates from the time of its founder, the redoubtable Sir Walter Manny. Except the fragment of the great cloister, the rest looks like late Perpendicular work,* and the fine hall has been undoubtedly greatly altered, probably by the Howards, when the place was converted into the town mansion of that family, after the Reformation. Of the great cemetery, with its chapel called "Pardon Church Haugh," nothing now exists, though projecting from the angles of a secular building when Maidland wrote his History of London. There was another cemetery bearing the same name adjoining St. Paul's Cathedral; as the latter was the earlier foundation, probably the dedication of that adjoining the "Charterhouse" may have been copied from it.

Of the great Military Priory of "St. John of Jerusalem," two important portions still remain, the noble gate and the choir of the church. The gate is a fine late Perpendicular structure, probably the work of the Grand Prior Docwra, and is now used as the headquarters of the "St. John's Ambulance Society." The much mutilated and modernized choir and aisles form the present parish church; what old work is visible is of the Perpendicular date, but beneath it is a fine Transitional Norman crypt. Stowe says that the church possessed a noble tower and spire, and that the latter was "enamelled and gilt"; evidently it was of metal, probably lead with patterns of copper or latten beaten into it. The tradition that the church was 300 ft. long is probably an exaggeration. The existing choir and aisles do not look as though they had formed portions of a very large church, and Vertue's view which represents "the Priory Church of Saint John," as a vast structure with three towers, and an elaborately panelled gateway, is not St. John's; Clerkenwell, but Saint John's Abbey, Colchester. The drawing of the gateway proves this beyond a doubt. These "military orders" did not build large churches. The principal church of the Knights of Saint John, at Paris; "St. Jean Lateran," which was in existence when the writer visited Paris in 1851, consisted simply of a nave and one-side chapel with a grand isolated tower. Hollar's views show the church at Clerkenwell, reduced to its present dimensions, attached to c-buildings rather of a castellated than ecclesiastical character.

The old Priory of St. James, Clerkenwell, has entirely disappeared, though considerable remains existed at the close of the last century. The church, which is illustrated in Pink's "Clerkenwell," and by Malcolm, consisted of a choir and south aisle 80 ft. long, a space between nave and choir 20 ft., and a nave 69 ft. The tower was between the nave and choir, and there was a very long north transept, which probably served as the nun's choir; as their convent, dedicated to St. Mary, adjoined it, the very elaborate Perpendicular cloister of which stood upon the site of Newcastle-place. This

* Probably, from the initials "J. H." being upon it, a large portion of the building was erected by Prior John Houghton.

cloister must have been one of the most beautiful in London, judging from the numerous views taken of it before its destruction; it was vaulted in a very similar manner to the south cloister of Westminster Abbey. Their refectory also appears to have been a fine apartment. The church itself was for the most part Transition Norman, but with tower and windows of fifteenth century date. It was a long building, over 170 ft., but rather low and narrow in proportion, as the nave was only 22 ft. wide and 34 ft. high. The arches which separated the choir from its aisles and supported the tower were richly moulded, and the columns were clustered.

Close by the walls of St. James's Priory ran "the Fleet," or "River of Wells," with its numerous wells, and on the opposite bank was the "Estate of the Monks of Ely," about Saffron Hill and Field-lane, which in later times became such a filthy neighbourhood. A little higher up the hill stood "Ely-place," the magnificent town residence of the Lord Bishop of Ely, and certainly the noblest ecclesiastical residence in London. Of the buildings the chapel alone remains, a pure and most beautiful example of the late thirteenth century "Geometric" style. The interior is fairly well preserved, and the work is of the most sumptuous kind. The exterior was quite as elaborate, as may be seen by a fragment of the canopy work on the south side, the east and west windows, &c. The curious crypt, with its heavy plain wooden beams, is an unexpected adjunct to such an elaborate superstructure, but it is certainly a remarkably picturesque building, the effect of the rough stone walls, huge timber beams, with the red lamps burning before the altars, seen through the surrounding gloom, have a very romantic effect. Old plans and views show that the Palace* buildings surrounded two courts, one immediately attached to the chapel, which consisted of a cloister and other buildings constructed of stone. A far more irregular court occupied a position between this and the Strand. Here was the hall, a charming building of the same date as the chapel, and the solar, or great parlour, which looks like fifteenth century work. The rest of the quad seems to have been built of post-and-pan work, and on the east side was a kind of colonnade. This court was evidently not at right angles to the chapel, or Cloister Court, and was considerably to the east of the latter. An old drawing in the possession of the writer shows that the hall was not parallel with the chapel, and there is an old inn called "The Mitre," with a bishop's mitre carved in bold relief, and the date, 1546, inscribed beneath (unfortunately the date is modern), which could not have stood where it does if the outer court had been level with the Cloister Court. The Holborn front is described as having consisted of a strong gate and building, all of stone.

There were extensive stable buildings and offices, and an immense garden. The strawberries of Ely-place are alluded to in Shakespeare's play of "Richard III." John of Gaunt died in this palace in 1399. The greater part of the vast garden was taken away from the Bishops by Queen Elizabeth, and given over to Sir Christopher Hatton; hence we have the street called Hatton-garden. The buildings of the ancient palace, with the exception of the chapel, were pulled down in 1778-1781. The large size of the chapel is somewhat remarkable, but it would appear to have served as a church to the whole precinct, which was extra-parochial, and probably to the estate of the monks of Ely as well. There was evidently an external porch and steps to the upper chapel on the north side, with a doorway down to the crypt beneath it. The upper doorway still exists internally; probably this was constructed to give access to the extern public, as there were no buildings of the palace on this side.

H. W. BREWER.

COMPETITIONS.

LEWISHAM LIBRARY COMPETITION.—Mr. E. W. Mountford has been appointed assessor in this competition.

UNITARIAN SCHOOL BUILDINGS, BIRKENHEAD.—In a recent limited competition the plans submitted by Mr. T. W. Cubbon, architect, of Birkenhead, were placed first for new Unitarian school buildings to be erected in Bessborough-road. The scheme includes a future church and other buildings.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL SOCIETY.—The second annual dinner of the Edinburgh Architectural Society took place on the 22nd ult., in the Imperial Hotel, Market-street. Councillor Cameron, the Hon. President, was in the chair. After the loyal toasts, Bailie Mackenzie proposed "The Edinburgh Architectural Society." Speaking, he said, from a plain man's standpoint, he admitted that there were very fine buildings to be seen, with much detail on them, but he did not know that the public were sufficiently educated to appreciate such buildings. He did not doubt that there were beauties in such buildings if ordinary people were able to see them. In the education of the professional architect he thought sometimes that there was a defect, in that the students did not study the kindred branches of the profession in regard to physics, chemistry, and electricity. Architects, he thought, lost sight of these in pursuit of what was purely architectural detail. For example, he believed that a little knowledge of electricity and of electric lighting would be of great service to young architects. Mr. Jas. A. Williamson, the President, responded for the Society. The Society, he said, had now been founded for two years. It consisted of junior members of the profession, and it had cut itself adrift to some extent from the older Association. Whether that policy was right or wrong it was not for him to say, but they felt that their own individuality was the very life of the Society. There was a disposition on the part of the older Society to take them, the younger Society, under its wing; but, apart from questions of policy, they could not overlook the fact that so long as they had the funds to carry on the Society, and had life and vigour, it were perhaps better to remain independent. Mr. Williamson afterwards proposed "The Corporation," and said that they, as architects, had reason to congratulate themselves that the members of the Town Council were very zealous of the amenities of the city. They had an instance of that in the attitude which the Lord Provost had taken up with regard to the proposal to put up an electric sky-sign in the Old Town. Bailie Pollard, in acknowledging the toast, said that the Corporation were engaged in a great many matters that were purely architectural. For example, there was the rebuilding of the North Bridge-street, and he hoped, in that connection, that the Town Council would not be so far left to itself as to become the builder of the street. Then, again, the Corporation had in hand the matter of the Usher Hall. He did not feel, as a member of the Corporation, that they had very much credit in alluding to that question. He was sorry that the Corporation had not been able with greater promptness to show their appreciation of the gift of Mr. Usher by finding a site for the hall before the present time. He hoped, however, that before very long a suitable site would be found. Other toasts followed.

ROWTON HOUSE, NEWINGTON BUTTS, S.E.

This building, situate about 250 yards from the Elephant and Castle, has just been opened. It is the third of a series of "poor man's hotels," and the site has a frontage to a recreation ground which was formerly the churchyard of St. Mary, Newington, of 214 ft., and a superficial area of 27,450 sq. ft. The building has been set back 10 ft. from the forecourt line in front, and the elevations are in pressed Leicester facing bricks, relieved with mingled gaults and dressings of pinky buff terra-cotta, from Edwards, of Raebon. The whole of the interior walling, excepting where glazed bricks are used, is built with gault bricks. The roofs to front elevations are covered with green slates, nailed direct upon coke breeze concrete slabs, carried upon steel construction; all other roofs are flat, concrete and steel construction, covered with asphalt. The floors are fireproof throughout, formed of concrete and steel, and the staircases and landings are in Portland cement concrete. To avoid a cavity between the surface of concrete and flooring, the floor-boards are nailed directly upon the concrete to cubicle floors, and solid block floors are bedded directly thereon to all other rooms. Access is obtainable to any portion of the underground work by inspection manholes. Iron pipes, with coated interiors, are used wherever it has been necessary to carry them under the building. The drainage has been divided into sections for purposes of efficient ventilation. A system of lighting has been adopted giving the official on each floor of cubicles control of the gas upon that floor; the various rooms on the basement and ground floors are controlled separately, one from another, and, in

addition, the superintendent has complete control in the meter room, over all the various sections.

The building is divided for administrative purposes into five sections. 1. Superintendent's apartment, with separate accommodation for Office Clerk. 2. Bed-makers. 3. Catering section, which includes sleeping accommodation for females employed in shop, kitchen, and scullery. 4. Lodgers' day-rooms. 5. Lodgers' cubicles.

The sections 1, 2, and 3 are planned so that there is no communication whatsoever between them and the lodgers' sections 4 and 5, except by passing the Clerk's office at the entrance on the ground floor. The superintendent's residence comprises a self-contained residence of two stories, with a front entrance door next to the entrance door of office. The section used by the bed-makers is approached by the door at the side of, and in full view of, office, and has a separate staircase giving access to their rooms in the basement and the cubicle floors; this staircase is a provision to enable the bed-makers to reach the cubicle floors without passing through any portion of the day rooms or corridors used by lodgers. The walls of staircase are in ivory glazed brickwork. In this section are a sitting-room and soiled linen room, &c. The portion of the basement under the entrance, smoking-room, and lodgers' crockery store, is occupied by the catering department, with sitting-room and bedrooms for the female staff, under reading room. The kitchen is 26 ft. by 27 ft., built in ivory glazed brickwork from floor to ceiling, the floor being of wood block with quarry-tiled margin and hearth. The scullery, 21 ft. 6 in. by 19 ft., is also built in ivory glazed brickwork from floor to ceiling. Lifts constructed in glazed brickwork are provided from scullery to lodgers' crockery store and to shop on ground floor. The larder is 18 ft. 6 in. by 12 ft. A service lobby is formed between kitchen, scullery, and larder, with stairs, carried up to shop on ground floor, and, in addition, a staircase from this lobby gives access to shop. A storeroom is provided opposite the kitchen, and another storeroom is placed in the passage outside the kitchen. A corridor extends from kitchen and under reading-room, where is provided a sitting room and four bedrooms for the use of the female staff employed in the catering department.

The dining-rooms in section 4 provides seating for 440 men, and in addition a number of extra seats are provided. Pictures are hung in frames around the room. The tables and seats are in teak on cast-iron standards. Four large cooking ranges, with ovens, hot plates, and grills are provided out of the line of traffic in each part of the rooms; boilers at the back of two of these provide a supply of boiling water for lodgers for cooking, tea, &c. The lodgers' scullery is placed between the two large dining-rooms, with access from both, and is a provision to enable lodgers who wish to prepare their own food for cooking to do so out of the dining-rooms. It is built in ivory-glazed brickwork from floor to ceiling, and fitted up with twelve white enamelled fireclay sinks, with hot and cold water supply to each and teak draining-boards. Between the dining and smoking rooms a lobby is formed, giving access to the crockery and service room. A shop is planned with windows at each end, opening into and giving a view of dining and smoking rooms. The smoking-room adjoins the dining-room. The floor space is 1,600 ft. The reading-room is placed at the rear of the building, and is an L-shaped room having an area of 1,450 ft. The seats and tables, in teak, provide for 160 men, in addition to a number of wooden easy chairs around the three glazed faience fireplaces, and in other parts of the room. Pictures furnish the walls as in other rooms on this floor. A staircase is formed at the staircase end of the main corridor, giving access to the large flat roofs over the dining-rooms, &c., on the first-floor level, and the space thereon is fenced in, provided with seats as a lounge and open-air smoking space. A large space has been divided up into seven corridors, top and end lighted and ventilated, fitted with lockers. The water-closets and urinals are placed outside the building in the courtyard at the rear of the building, and are cut off from the same by means of a cross ventilated lobby. The work throughout is constructed in white-glazed brickwork. There are forty-one water-closets (in addition to those on the cubicle floors) placed in one building, top-lighted from end to end, and top louvre ventilated. Each water-closet is fitted with an "Acme" water-waste preventer, a Doulton's pan and trap bedded in solid concrete up to the underside of the seat; the riser is in glazed brickwork, and the seat in teak. There are twelve urinals in the same building. A fumigating room is provided outside the building, where the waste water from the furnaces is utilised. Two staircases lead from the end of the ground floor corridors down to the basement, where the accommodation is as follows:—The lavatory and feet washing room is 30 ft. wide by 7 ft. long. There are eight lavatory-basins. A section, 7 ft. wide by 36 ft. long, has been divided off by an obscured glazed screen to form a room for feet-washing, fitted with twelve deep feet-washing troughs, with teak boards between each, and hot and cold water supply carried to each trough. The bath-rooms, &c., are placed on each side of a corridor extending from the lavatory to the lodgers'

* Usually called "Place."
† Or, at any rate, recent.

washhouses at the foot of the front main staircase. They are each fitted up with ivory glazed fireclay baths, with teak bath tops, and brass taps for hot and cold water supply. The walls and front of bath are in ivory-glazed brickwork. Two extra rooms are provided for use, either as bath or dressing-room. A large room is provided under the reading-room as a barber's shop. Two rooms are provided and fitted up in the basement corridor at the base of the two main staircases as workshops for shoemaker and tailor, and adjoining them are two bedrooms for the use of the male staff. The lodgers' washhouse is separated from the foregoing corridor by a glazed screen, and is fitted with washing troughs in ivory-glazed fireclay. A room is fitted up under the ground floor locker rooms for the storage of tool chests and other bulky articles that the lodgers may desire to have taken charge of. Opposite the parcel-room a space is fitted up with table, &c., for clothes and boot cleaning. A room is provided for the officials who are employed in sections 4 and 5.

The lodgers' cubicles are approached by two fire-proof staircases, built in ivory glazed brickwork, situated at the extreme boundaries of the site and end of the cubicle corridors, and are carried up to the roof. The cubicle corridors run from staircase to staircase, and each floor is divided by divisional walls into ten sections. There are six floors of cubicles with a total sleeping accommodation for 824 men; each bed is in a separate cubicle, and every cubicle in the building has a window under the control of the occupant. The portion of the cubicle partition next the corridor is 6 ft. 6 in. high, while the divisions dividing the cubicles are 7 ft. 6 in., leaving a space, up to the ceiling level, free of partitions for ventilation. Two water-closets and a sink with cold water drinking supply are placed on each landing outside entrance to cubicles for night use. A room with an external window has been provided on every floor for reception of linen, &c., from lift, which is formed therein. The architect of the building was Mr. Harry B. Measures, of Westminster. The buildings have been erected by Mr. Masters, as clerk of the works, the Rowton House Company being its own contractor.

Books.

Modern Architecture: A book for architects and the public. By H. HEATHCOTE STATHAM, F.R.I.B.A. London: Chapman & Hall, 1897.

HIS book is founded on the lectures on "Modern Architecture" given by the author to the Class of Design of the Architectural Association, which were never printed or reported in any form. The substance of these lectures is here drawn out into literary form, and accompanied by a number of views and plans of modern buildings, reduced from drawings which have appeared in this journal, and in various foreign architectural journals, and from photographs.

In these pages we can merely, of course, describe the contents. The first chapter is a review of "The Present Position," and consists of a consideration of the task which lies before the modern architect and the influences and requirements which have to be taken account of in the modern practice of architecture; the general aim of the chapter being to urge that architecture is not an art pure and simple, but an art complicated by many practical requirements of modern life, such as did not exist in any former period of architecture. Generally speaking, in fact, the first chapter is practically, though not ostensibly, an answer to the views of architecture expressed by such critics and architects as the authors of "Architecture as a Profession or an Art."

The succeeding chapters deal with the subjects of "Church Architecture," "State and Municipal Architecture," "Domestic Architecture," and "Street Architecture;" the aim being, in each chapter, to point out what are the special requirements and conditions of the present day in regard to the class of buildings dealt with in that chapter, and to illustrate what has been recently done in each department of architecture which is treated of.

The book concludes with a short chapter entitled "A Note on Iron," in regard to the part which some persons suppose iron must play in the architectural designs of the future, on which subject the author sums up in the following words:—

"In addition to this question of monumental structural character, there is that of appearance. It is impossible that any structure designed for the visible employment of iron or steel as its principal materials can ever possess the grandeur and breadth of effect of a stone building of the same proportions and dimensions. With whatever new materials we have to deal, architecture must still remain the art

of producing what is beautiful and expressive in building, which involves a great deal more than the mere question of economic structure. . . . Let any architect of 'advanced views' on this question of the employment of iron propose to a client to erect his private mansion, in his own park, of the most modern and approved concrete and iron construction, and there can be no doubt what answer he would get.

The idea that iron is to revolutionise modern architecture I hold therefore to be a complete fallacy, based on bad reasoning and on a confusion between engineering and architecture. Architecture still remains the art of producing beautiful and expressive structures, not economic or merely utilitarian ones; and whenever it relinquishes that aim, it will cease to be architecture in the full and true sense of the word, and there will be an end of it as an art."

The Chippendale Period of English Furniture. By K. WARREN CLOUSTON. London: Debenham & Freebody, and Edward Arnold; New York: Edward Arnold.

UNDER the title of "The Chippendale Period," the author has included both the work of some of the less famous contemporaries of Chippendale, and that of his almost equally famous successors, Hepplewhite and Sheraton. The book is a good illustrated treatise on the furniture of this period, within a comparatively small compass. The introduction gives a brief sketch of the furniture of the earlier classical period, when architects had more control over furniture design, and when the design itself partook largely of architectural forms and details.

It was the great merit of Chippendale, or one of his great merits, that, without losing sight altogether of architectural and constructive principles, he perceived that furniture might have architectonic forms of its own, more light, free, and graceful than those which properly belonged to architectural design and construction; and that, in fact, he evolved a furniture style of his own, not dependent on the mere reproducing of architectural details. His other great merit was, of course, his excellent and careful workmanship, by which alone some of his very slight-looking designs were rendered practically serviceable. On the other hand, it must be admitted that there are in his designs many incongruities which a pure taste cannot possibly defend; and amid the present fashionable admiration of his work, which is not very discriminating, these defects are too much overlooked, though they would probably be at once recognised if they appeared in any furniture of modern make and design. Among the things illustrated in this work, for instance, the majority, if regarded by the "dry light" of criticism and apart from the fashion of taste of the day, are not really good design; they are too much clogged with the unconstructive broken curves derived from Louis Quinze examples. The pier-glass frame, fig. 47, is simply execrable as design, though this is an exceptionally bad instance. Many others which are more or less questionable in taste make amends for this by their freedom and consistency of style and treatment; but of things which can be really called good designs, of the illustrations given in the book, we should really find it difficult to pick out more than two or three; in fact there is hardly one that does not include some detail that one feels bound to take exception to. Of the chairs the best perhaps is fig. 16; the shaving table and washstands on pages 56, 57, are entirely unexceptionable but rather tame; the clothespress shown in fig. 49 is a fine bold conception as to general form and outline, but would be better if a great deal of the flagee were shaved off. In short, Chippendale's is work to be admired after its kind, but not to be imitated, except in regard to its thoroughness of execution.

Chippendale's contemporaries showed all his faults in the matter of taste. Some of his successors, on the other hand, were decidedly superior to him in lines of design, though they no doubt owed him something. The furniture designed by the Adams was perhaps rather too formal in line, but it at all events escaped the ramping curves in which Chippendale too often indulged. But Sheraton and Hepplewhite managed to combine, in much of their best work, the freedom and flow of line of Chippendale with a much more restrained and architectural character in the detail, as also did Shearer, who formed a kind of link between them and Chippendale. Some of his designs illustrated in this book are, in point of line and

constructional character, superior to any of those by Chippendale of which illustrations are given. The same may be said of some of Sheraton's, though no doubt Sheraton was a mannerist, and had little tricks of detail that are always recurring. Chippendale had the most decided genius of them all, but it was genius working in a bad school of design; and it is as well that this should be recognised.

We can recommend Mr. Clouston's book, however, as a well written and well illustrated summary of the subject.

Reliques of Old London. Drawn in lithography by T. R. WAY. With an introduction and descriptions by HENRY B. WHEATLEY, F.S.A. London: George Bell & Sons, 1896. *Later Reliques of Old London.* Lithographed by T. R. WAY. Described by H. B. WHEATLEY, F.S.A. London: Geo. Bell & Sons, 1897.

THESE two are companion volumes, differing only in the detail of the binding, which in the earlier volume has a simple design imitative of brickwork, in the latter of timber-work; there is nothing however symbolical of the contents in the two bindings, since the later reliefs show no larger a proportion of this mode of construction than the earlier ones.

In other respects these are practically two volumes of one publication, the chief end of which is evidently the illustrations of old houses by Mr. Way, in the lithograph medium which is now lifting up its head again. From the purely artistic point of view Mr. Way puts rather too much work on his lithographs, for the true artistic function of lithographic drawing, as of etching, is rather to suggest than to realise; but as the object of these illustrations is to record the aspect of old buildings and streets which are of historic interest, the fuller and more realistic style employed here is perhaps the right one for the purpose; it conveys the real impression of tone and light and shade with far less labour than could be attained by either etching or ordinary line drawing, although with the inevitable drawback of the somewhat dingy appearance which characterises a heavily-shaded lithograph. Sometimes this heavy and dingy effect assists the intended expression (of the drawing; giving a pathetic melancholy, for instance, to the drawing of the "House in Houndsditch" (Vol. II. Plate 2), which in an outline pen-drawing would be merely a prosaic record of a cube of house with hole-in-the-wall windows.

The lithographic method as employed here, though not so attractive to architects, is however probably much more attractive to the public generally than line drawing, and the two books make an interesting and valuable pictorial record of old houses and streets, some of which are gone, and others of which will probably not be allowed to remain very long. They contain a great many picturesque studies of different corners of Old London, and we may say that there is not a single illustration in the two volumes which has not its own interest. Mr. Wheatley is a perfectly competent historical exponent; his brief notes on the various drawings contain a good deal of information; from a critical point of view he makes a little too much of the architectural value of some of the specimens; but lovers of old houses have that way with them. At all events, author and artist working in collaboration have produced two very pretty and interesting volumes. Mr. Wheatley's preface to the second series contains some good general remarks about the value of old buildings; but when he asks the question, why these old buildings please though often not remarkable for their architectural character, and answers that it is not only old association but "harmony with their surroundings," we say that the two influences are blended together, and that what he calls "harmony with their surroundings" really arises from association; various buildings have stood together for a long time and appear therefore to belong to each other; they have the same stains of weather and time on them; the best modern building thrust among them will seem out of harmony with its surroundings, to contemporaries; but it will perhaps appear quite harmonious in a hundred years. We cordially agree with the remark at the end of the preface to the first series, as to the value of the architectural vistas still to be seen in London streets, such as that in the Strand looking towards St. Mary's Church, and that "every Londoner

who takes a pride in his city should see that such vistas are not destroyed either by individuals or by Boards."

One question we may ask—why print "reliquies" in the title, which is not English as now spoken, and not recognised in dictionaries? The whole text might just as well have been printed in antiquated spelling, if that principle was to be adopted.

The Workman's Compensation Act, 1897. With copious notes by W. Addington Willis, Barrister. Second Edition. London: Butterworth and Co. and Shaw & Sons. 1897. THERE is little to be said of this book. It contains the Act of this year, which will come into operation next July, with various short explanatory notes. An instance of the character of the work can be shown by reference to Section 7 of the Act, in which it is stated that the word "Factory" has the same meaning as in the *Factories and Workshops Acts 1878 to 1897*. The author then gives as a note to this section the meaning of the word in the above Acts. We are quite opposed to this kind of legislation by reference, which often leads to trouble and even litigation, but it affords opportunities for useful works such as this before us, which is handy in size, and in most respects may be recommended.

Proceedings of the Incorporated Association of Municipal and County Engineers. Vol. XXIII.; 1896-7. Edited by THOS. COLE. London, E. & F. N. Spon: New York, Spon & Chamberlain. 1897.

THE greater contents of this volume have been briefly summarised in our reports of the successive meetings at which the papers were read and discussed; but they are all here in full, and with a good many diagrams and illustrations. The subjects treated of include, among others, the Bristol Electric Lighting Station, the Public Works of Dover, "Groyne" (by Mr. A. T. Wainisley), descriptions of Municipal work and Sewerage work in various cities, the Laying-out of Parks and Recreation Grounds, &c. The volume, of nearly 500 pages, contains a great amount of practical information and suggestion on some of the most important subjects connected with the sanitary and other requirements of cities.

ALMANACS AND DIARIES FOR 1898.

MESSRS. HUDSON & KEARNS (83, Southwark-street, S.E.) have sent us a parcel of their well-known professional diaries, and their blotting-pad diaries for 1898. The standard of excellence of previous issues is maintained in the diaries and pads for the present year, and the information contained in them is both up-to-date and reliable. "The Architect's Diary" is again issued in two sizes, Nos. 12 and 13 (one and two pages to a day respectively), and its usefulness to professional men is apparent at a glance. It contains a list of cases decided in the superior Courts of Justice during the legal year from November, 1896, to August, 1897 (collected by Mr. J. Shearwood, Barrister-at-Law), a complete list of Metropolitan Surveyors and districts, with official and private addresses; revised regulations under the London Building Act, 1894; and other matters of interest to architects, as well as the usual postal, &c. information contained in a diary. As we remarked last year, the section entitled "Architecture and Archeology" is still incomplete, for it does not include all the provincial architectural societies. The usefulness of the diaries would be extended, we believe, if this section were revised a little more carefully. "The Builder's Diary," No. 11, contains some practical tables for builders, as well as other information; and the "Diary" and "Note Book," No. 9, is a useful work, containing, like "The Builder's Diary," much of the information to be found in the "Architect's Diary." The date-indicating blotting-pads issued by the same firm are as well arranged and as convenient in form as ever, and their get-up leaves little to be desired. "The Banker's Pad" is a specially good form.

Messrs. Waterlow Bros. & Layton, Limited (24 and 25, Birchin-lane, E.C.), have issued their "Architects' and Surveyors' Diary for 1898." The work contains a mass of information for architects, surveyors, and auctioneers, such as lists of Fellows and Associates of the Institute of Architects, the Surveyors' Institution, Institution of Civil Engineers, Auctioneers' Institute, District Surveyors, &c.; a digest of

the principal Acts relating to buildings, &c.; conditions and contract on taking building land; London County Council by-laws; general conditions for building contracts; rules for parsonage houses, and for planning and fitting up schools; practical tables and forms, &c. The work is handy in size, and is well arranged and up to date.

Messrs. Partridge & Cooper's (Fleet-street) Diaries for 1898 contain much useful information, besides being neat and well made. Their 1s. interleaved blotting diary is a specially cheap and useful work.

"The City Diary and Almanac for 1898" (Messrs. W. H. & L. Collingridge, 148 and 149, Aldersgate-street, E.C.), is the 33th issue of this well-known annual. It is interleaved with blotting-paper, contains much information in regard to City affairs, is issued at 1s., and is a very useful little work.

"The Railway Diary and Official's Directory for 1898" (London: McCorquodale & Co., Limited), has been issued, containing, as usual, useful information as to traffic returns, accounts, lists of officials, &c.

"The Indian and Eastern Engineer" Diary for 1898 (Calcutta: and 50, Fenchurch-street, London), contains all the useful information of previous issues. The publication is presented to yearly subscribers to *The Indian and Eastern Engineer*.

"The Gloucester" Diary and Directors' Calendar for 1898 (F. J. Brooke, for the Gloucester Railway Carriage and Wagon Company, Limited), is the third annual issue of this little work.

Messrs. J. Weeks & Co., Limited, horticultural builders and hot-water engineers, Chelsea, have issued a "Horticultural Pocket-Book and Diary for 1898." It is published by Messrs. Partridge & Cooper, of Fleet-street.

We have received from the Sun Fire Insurance Office some of their date indicators and blotting-books.

The Rugby Portland Cement Company have issued a date indicator, showing views of their works, &c.

Correspondence.

To the Editor of THE BUILDER.

FIRE PROOF BUILDINGS.

SIR.—Referring to Mr. Arthur Keen's letter in your issue of the 18th ult., in which allusion is made to solid joist construction, I think this mode is deserving of more consideration. It is seldom used, but is capable of almost universal application. For ordinary floors, to a bearing of from 10 ft. to 20 ft., 6 in. to 9 in. joists may be set together and spiked in a special manner, so that the whole is practically a solid slab, supported upon all four sides. With a little ingenuity openings of all shapes can be arranged; the upper side is planed off and the underside may be left rough or plastered. It then forms a capital floor; silent, elastic, and fireproof, and is moreover by far the cheapest form of fireproof wood block floor.

Stairs can be formed in the same manner about 4 in. thick. Such flooring, supported if necessary by massive wood girders and posts, encased with plastic material, would, I believe, resist any ordinary fire. I first saw this construction in a small mission hall, and have adopted it in a Board school, and in a large wine and spirit warehouse where up to the present it has proved satisfactory.

With regard to the spread of fire, I notice in your first article upon the Cripplegate disaster an allusion to iron shutters to windows. It is remarkable that, with all the care bestowed upon floors, stairs, and internal openings, the fact is overlooked that all these may be practically useless while window openings are unprotected. If these are defended by rolling iron shutters, the fire within will be deprived of the rush of air which so quickly turns a building into a well-draughted furnace, and the chances of prompt extinction will be vastly increased; while the flames from an adjoining or opposite building will be effectually prevented from entering through the shuttered windows and spreading the fire from without.

Such a precaution appears to be doubly necessary in the case of well-hole windows. The mechanical difficulty is not serious—at closing time inside or outside shutters could easily be worked by gearing, and, in the event of sudden alarm by day some appliance for quickly dropping them in sets could surely be devised.

GEO. WAYMOUTH.

COST OF FIREPROOF BUILDINGS.

SIR.—At the Cripplegate fire inquest before the City Coroner, the Surveyor for the district is reported to have said that in his opinion it would cost an extra 50 per cent. to make such buildings fire-

proof. Possibly this is a printer's error for 5 per cent. If it costs half as much again to make buildings fire-resisting, few will entertain the idea.

From a large experience in fireproof construction, consisting mainly of floors and partitions, I find that the cost of floors formed of steel joists, cement concrete, and the added safeguard of a fireproof suspended ceiling, rarely exceeds 5 per cent. upon the total cost of the building.

The extra cost of fireproof partitions over lath and plastered stud partitions, and the small outlay incurred by casing with a non-heat conducting material all stanchions and columns, is more than met by the difference in cost of the ordinary wood joisted floor and a fireproof floor.

But unfortunately this extra 5 per cent. deters many from adopting any fire-resisting construction, and it therefore rests with the public authorities to insist upon it.

T. LEWIS BANKS, F.R.I.B.A.

HOUSE DECORATION.

SIR.—I had not the advantage of being present when Mr. Shuffrey read his paper on "House Decoration" to the Architectural Association, but I have read the report in your columns.

It would be ungracious to write now a detailed criticism of the technicalities; but to one or two of the recommendations addressed to young architects I must demur, because they will land them in trouble.

The lecturer seems to have said: "New walls, if intended to be painted, should be plastered with Parian or Keen's cement." If by new walls are meant "new brick walls," I can only say that new brick walls should never be plastered with Parian cement if they are to be decorated, for a destructive efflorescence will assuredly injure or destroy the decoration.

Parian cement may be used on lath partition or on old brickwork; but on new brickwork it is a fertile source of vexation.

I must also demur to Mr. Shuffrey's advice to take the late M. Chevreul's work on colour as a guide for students, either on the side of theory or practice. It is far from being a safe guide. Originally published quite fifty years ago, its English translation is dated 1854, and, so far from its theory of colour being exhaustive, it is now admittedly in need of great modification. M. Chevreul's work was a highly important one, and took a new departure with much labour and careful experiment; but he drew some most erroneous deductions from his experiments, which were themselves founded on an imperfect theory. I can imagine no book more likely to land the inexperienced decorator in woful blunders; though it be full of very suggestive matter for the wary reader.

By far the best book for students in colour, or, indeed, for those with some experience, is that by Professor A. H. Church, entitled "Colour: a Manual for Students," of which editions were published by Cassell & Co. in 1887 and 1891. In this work, not only is the modern theory of colour explained, but its application in practice, for decorative and other purposes, is admirably and artistically dealt with. The same author also published in 1892 an excellent manual, entitled "The Chemistry of Paints and Painting," equally valuable to the decorator.

J. D. GRACE.

THE CARDIFF TOWN HALL COMPETITION PLANS.

SIR.—With reference to the tail-end of your leader on the above, I hope, after perusing my letter, you will acquit me of attempting to catch the eye of a professional assessor by getting up my plans in a "tricky" way, and I venture to express a little disappointment when I reflect that my very sober line elevations, without even a wash of monotone, failed to acquit me of such arrant stupidity.

A spectator viewing a building in progress from an eminence sees the sectioning of the walls white and the rooms and surroundings toned and tinted. If after plans are lined-in and the floors of the rooms tinted, they are cut out and pasted on a sheet of toned paper, conventionally shaded, you obtain, with a very small expenditure of labour, a rough natural representation; and I have found by experience that plans so finished can be grasped by every one at a glance—indeed, this method of plan drawing possesses many of the advantages of a model, without any of its disadvantages. The accepted method of backing the sectional portions of plans—to which you appear to take no objection—is in reality making white black! and undoubtedly had its origin in a "tricky" desire to arrest attention by false graphic force. It is not unlikely that the extravagance was accepted and continued as it was found to be a convenient method of obliterating faulty and ignorant construction.

Any one who wishes to show rather than to skirt work, would favour the white wall, or, true sectioning.

Writing about so small a matter at all, which at the outside occupied two days, as compared with two months' solid thinking devoted to the plans alone, reminds one of the days when calligraphy was gravely discussed as a fine art.

* * If the plan in question had been very successfully adapted for its purpose, we should perhaps not

have referred to its peculiar make-up; but it did not strike us as being a good plan. As to the method employed, we do not in the least agree with our correspondent that it makes plans any clearer; on the contrary, it confuses the eye and interieres with one's estimate of the arrangement of the rooms and the relative spaces they occupy. It is very well to give effect to sections, but it is not applicable to a plan.—ED.

THE SOLID WOOD FLOOR.

SIR.—I can put Mr. Arthur Keen on the track of information with regard to the solid wood floor, about which he wrote in your issue of the 18th ult.

About seventeen years ago, I was introduced at Huddlow to a method of constructing floors exactly as described by your correspondent. The invention seemed to me to have great merits, for the floor so constructed would not only resist fire for a very long time, but would lie upon the walls as a slab, exerting only a vertical pressure. The author of the invention was, I am nearly sure, Mr. Swaine, later on, in 1883, clerk of works at Truro Cathedral. A. B. P.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—I.

BEFORE commencing our treatment of this subject, it would be well for us to explain from what standpoint and on what basis that treatment is to be founded. The point of view from which we think it desirable to commence, is that of a young student who is intending to prepare himself for the Intermediate Examination of the Royal Institute of British Architects, and whose knowledge of mathematics has become somewhat rusty from disuse since the day he left school to enter an architect's office. We shall therefore treat the subject with great simplicity, and assume that the student at the start either knows very little or has forgotten a great deal.

With this for our starting point, we propose to deal with the subject of the calculation of strength of materials and resistances primarily as required by students preparing for, first, the intermediate, and then the final, examination of the Institute; and afterwards proceed to more advanced problems beyond the scope, at present, of the Institute examinations, but, nevertheless, very useful and desirable as part of the mental equipment of the architectural practitioner. As the calculation of problems relating to strength of materials is very largely carried on by means of formulae, it is desirable for us to define what is meant by a formula, and our definition is this:—A formula is an algebraical equation, which gives us a ready method of expressing the relation between various properties of certain pieces of construction.

In order, therefore, to make use of formulae, the student must be acquainted with the simple operations by which equations are solved. This is ordinary simple algebra; and although we do not propose in this column to teach a student algebra, we will just run through the operations, most generally employed, for the sake of refreshing the memory of our student.

The equation is the statement of equality between two quantities, thus we say, $x = A + B$, where x is one quantity which is equal to the sum of the two A and B . Now with this or any other equation we can perform any operation we please to either side provided we do the same to the other. We can add the same quantities to both sides or subtract the same quantities from both sides, or multiply both sides by the same quantity, or divide both sides by the same quantity, and none of these operations will affect the truth of the equation.

Let us thus take a few simple examples of these operations, starting with the equation $x = A + B$. Let us suppose that $x = 5$, $A = 3$, $B = 2$. Now if we suppose that $C = 4$, we shall readily see that the addition of C to both sides of the equation gives us $x + C = A + B + C$, and $5 + 4 = 3 + 2 + 4$; similarly, $x - C = A + B - C$, and $5 - 4 = 3 - 2 - 4$. Again, with multiplication, $x \times C = (A + B) \times C$, and $5 \times 4 = (3 + 2) \times 4$; so also with division, $x \div C = (A + B) \div C$, and $5 \div 4 = (3 + 2) \div 4$.

These operations the student must be able to perform with readiness in order to do anything at all in the working of formulae; but for all ordinary cases it is not requisite that the student should have any more extensive knowledge of algebra, although an acquaintance

with the various methods adopted of solving quadratic equations would be of considerable assistance. We will not, however, proceed with instruction in algebra, but go on at once to introduce our student to one of the simplest and most frequently used of the formulae that come within the range of practical building. The formula which we will now investigate is that for the transverse strain of a beam. We will begin, first of all, with a timber beam, and then afterwards pass on to an iron beam. A comprehension of the way in which this formula is first of all arrived at, and then used in actual practice, will afford very good instruction in the general principles and application of formulae as a whole.

The strength of a beam varies according to its dimensions, and by experiment it is found that as the breadth of a beam increases or decreases, the strength increases or decreases in exactly the same proportion. So that if we compare by experiments two timber beams, which are alike in all respects, except that the breadth of one is twice the breadth of the other, the broader beam will break with twice the load which fractures the narrower beam. This fact is mathematically expressed by saying that the strength of a beam varies directly as the breadth, or putting it in algebraical fashion, $S \propto B$. If, therefore, the student wishes to compare the relative strength of two or more beams, which differ only in their breadth, he need not trouble himself to make any calculation as to the positive strength of the beam, but simply estimate the comparison of their breadths.

Next, taking into consideration another dimension—depth—it is found by experiment that, if two beams are alike in all respects except in their depth, their strength varies as the square of their depth. Thus, suppose we try an experiment with two beams precisely similar in all respects except that the depth of one is twice that of the other, the deeper will be not twice as strong as the other, but four times. And again, if we try this experiment in a similar way on two beams, one of which is three times the depth of the other, the deeper beam will be three times three—i.e., nine times as strong as the other. This is what is meant by saying that the strength of a beam varies directly as the square of its depth. Thus we now have the means of comparing the strength of beams which vary either in their breadth or in their depth; and, if we wish to compare beams which vary in both dimensions, we must multiply the variations due to the breadth by the variations due to the depth—i.e., expressed algebraically, $S \propto BD^2$. So that we can compare the relative strength of any two beams which vary only in their breadth and depth by comparing the BD^2 of the one beam with the BD^2 of the other. Thus we have a means of estimating the effect upon the strength of beams caused by variation in their two dimensions of breadth and depth.

Now we may pass on to deal with the third dimension—their length; and in speaking of their length, it is to be remembered that what we mean in our calculations of the strength of the beam by the length is the distance between the supports at the ends of the beam—that is, in other words, the span. Again, by experiment it is found that as the length of the beam increases or decreases the strength decreases or increases in the same proportion—that is, the strength varies inversely as the length. We must be careful to note the word inversely, the meaning of which is that increase of length means decrease of strength, and decrease of length increase of strength. Expressed algebraically, we have

this fact put thus, $S \propto \frac{1}{L}$. If, however, we want

to combine in our comparison of any beams the variation in their length, as well as variation in their breadth and depth, we have to do it by multiplying their breadth by the square of their depth, and dividing by their length.

Algebraically thus, $S \propto \frac{BD^2}{L}$.

The fraction $\frac{BD^2}{L}$ enables us to compare the

strength of any beams of a rectangular section so long as they are of the same material and loaded in the same way. But we must observe that this fraction gives us only the comparative strength of the beams, and does not tell us anything as to their real positive or ultimate strength. That is, it enables us to say how many times one beam is stronger than any other, but does not tell us

how many pounds or tons either of the beams will carry. In order to obtain this information we must make some further experiments. We find by experiments that, if we take a firm beam of good quality, and load it in the centre, it will break with a number of cwt. equal to about $3\frac{1}{2}$ times the value

of the fraction $\frac{BD^2}{L}$, with B as the number

of inches in breadth of the beam, D as the number of inches in depth of the beam, and L as the number of feet in the span; and if we go on with our experiment with any number of beams of similar quality we shall find that in every case they break with a central load in cwt. of about $3\frac{1}{2}$ times the value of this fraction $\frac{BD^2}{L}$ for each particular beam. $\frac{BD^2}{L}$

varies, of course, for each particular beam; but the factor $3\frac{1}{2}$ does not vary, and it is therefore called the "constant." Thus, we say, that a constant is the factor by which we multiply the fraction expressing the relative strength of beams, in order to obtain their ultimate strength. Writing this algebraically, and taking W to signify the "breaking weight," we have

$W = C \frac{BD^2}{L}$, which is the formula generally

used at the Institute examination for the transverse strength of a timber beam.

The next point which it is important that the student should clearly understand, is the relation between the W and the C in this formula at which we have arrived. We see that the experiment for the central load caused the beam to break with the value of the constant

at $3\frac{1}{2}$ cwt. Therefore in the formula $W = C \frac{BD^2}{L}$

when we intend to represent the breaking weight at the centre of the beam, C will have the value of $3\frac{1}{2}$ cwt., and *vice versa* when C is $3\frac{1}{2}$, W is the breaking weight in cwt. with a central load. Now we do not always want to find the breaking weight of a beam with a central load; we sometimes wish to know the breaking weight of a beam with a distributed load, and sometimes again we wish to know the safe load to put upon a beam. Now, by experiment, it is ascertained that a beam requires exactly twice as much load evenly distributed to break it as if the load is central. This can also be proved mathematically, but we will ask the student to accept our statement of the truth of the fact as the result of experiments, as the mathematics required are slightly more advanced than we presume our student to be master of just at present. We will take it, therefore, that the distributed load required to break a beam is twice that of a central load. If, therefore, in

making use of our formula $W = C \frac{BD^2}{L}$, we

wish W to be the distributed breaking weight, it is evident we must make the value of C in this case twice what it was when we were estimating for a central load, i.e., 7 cwt. instead of $3\frac{1}{2}$. Again, suppose we wish to find a safe load instead of a breaking load of the beam, it is always customary to take a small portion only of the breaking load of a beam, or any other piece of construction, as the extent of the load which may be safely applied. Let us take the safe load of a beam at the simple proportion of one-quarter of the breaking load, then if we say in our formula that W should mean a safe central load on a beam, we must make C one-quarter of the value which it had for the central breaking load, i.e., $\frac{7}{4}$ instead of $3\frac{1}{2}$. And if we wish W to mean the safe distributed load we must make C one-quarter of the value of the distributed-breaking load, i.e., $1\frac{7}{8}$ instead of 7. Thus we see that there is always a constant relation between the values which are assigned to W and to C in our formula, which may be expressed by saying that W and C are always in the same terms, by which we mean that if W is in cwt. C is in cwt.; if W is tons or pounds C is in tons or pounds; if W means breaking weight, C has a corresponding value; if W means safe load, C has another value corresponding to that.

This is one of the most important points to be understood and remembered in dealing with the formula for the transverse strength of beams, and it would be well for the student to learn by heart the following table:—

If W = Breaking weight in centre $C = 3\frac{1}{2}$ cwt.
 " W = " " distributed $C = 7$ cwt.
 " W = Safe load in centre $C = \frac{7}{4}$ cwt.
 " W = " " distributed $C = 1\frac{7}{8}$ cwt.

GENERAL BUILDING NEWS.

RESTORATION OF CHURCH, GEDNEY, LINCOLN.—The church of St. Mary, St. Mary Magdalene, Gedney, was re-roofed in 1860 by the Ecclesiastical Commissioners, and part of the south aisle was rebuilt in 1890; but nothing had been done to the main structure until the Rev. Canon Atkinson, Vicar of Bolton, was appointed to the living in 1895. He called in the Architect to the Ecclesiastical Commissioners (Mr. W. D. Caroe), who reported that an outlay of over 2,000l. would be required to put the building in substantial repair. The nave roof had become seriously decayed, some of the main structural timbers altogether missing and others completely rotted, whilst the north aisle roof had spread and pressed the wall with it. The roofs have been re-leaded throughout, the old lead having been re-cast; the timbers have been repaired and, where necessary, removed. The east wall of the chancel, resting on soft marsh land, had showed ominous cracks, and the operation of spreading the wall base has been accomplished. The floors have been replaced by wood blocks laid upon concrete, and the deal high pews removed. The upper part of the tower arch has been opened out. The old oak door has been cleaned from paint, and the discovery was made of an ivory plaque let into the panel, with a representation of the Crucifixion, the Virgin, and St. John, under rich canopies, carved in the fourteenth-century work. An Early English piscina was dug out of some brickwork in the north aisle, and a squint in the north wall of the chancel, has been opened out. The builders were Messrs. Cornish & Gaymer, of North Walsham.

PARISH CHURCH, STONEHOUSE, GLASGOW.—St. John's Parish Church was formally opened on the 18th ult. The building has cost 1,000l. The tower is over 90 ft. high. The interior of the church is divided into nave, transepts, aisles, and chancel. The roof over the nave is vaulted. The pillars and arching are of red stone. Mr. Alex. Cullen, Hamilton and Motherwell, was the architect.

RE-OPENING OF ST. EDMUND'S PARISH CHURCH, CRICKHOWELL.—During the past few months this church has undergone alterations and improvements. The work has been executed by Mr. Henry Smith, of Wolverly, Kidderminster, under the supervision of Messrs. Nicholson & Hartrey, of Hereford.

NEW AISLE, ST. GEORGE'S CHURCH, GLASGOW.—On the 11th ult. a new north aisle was dedicated at the Parish Church of St. George, Gravesend. The contractor for the work was Mr. W. H. Archer, and the architects were Messrs. W. & C. A. Bassett-Smith.

PRESBYTERIAN CHURCH, BRAMPTON, NEAR CARLISLE.—During the past six months considerable additions and improvements have been made to the Presbyterian Church at Brampton under the supervision of Mr. T. Taylor Scott, architect, of Carlisle, and the building has just been re-opened. The work has been carried out by the following contractors, all of Brampton, viz.:—Messrs. A. & P. Routledge, builders; Mr. William Edgar, joiner; Messrs. Penfold & Son, painters and decorators; Mr. Thomas Gash, plumber; Mr. Barker, plasterer; and Mr. Musgrave, slater.

RESTORATION OF BRECHIN CATHEDRAL.—Mr. John Honeyman, Glasgow, has prepared plans for the proposed restoration of Brechin Cathedral. The choir will be restored, the aisle walls rebuilt, and aisles and nave re-roofed; a north porch and small transept on the south erected; while the interior will be restored by the removal of the north, south, and east galleries, a small gallery being substituted in the west. Seating accommodation for 900 people is provided.

MEMORIAL CHURCH, SPRINGBURN, GLASGOW.—The new Ferguson Memorial Church, situated in Palmero-street, Springburn, was opened on the 18th ult. The new church is in Gothic style, accommodation being provided for 350 sitters. The architect was Mr. J. McKellar, and the contractors were—Mason work, Mr. Collier; joiner work, Messrs. Dick & Benzie; slater work, Messrs. J. M'Out & Sons; plumber work, Mr. J. Barrie; plasterer, Mr. D. McGilvray; heating, Messrs. M'Cormick & Co.

CHURCH, GOVAN, GLASGOW.—On the 18th ult. the foundation stone was laid of Saint Kenneth Church—a new church which is being erected at the corner of Katherine Drive and Hutton Drive, Holmfauldhead, Govan. It will accommodate 800 people, and there will be a hall constructed to seat 300, as well as smaller halls, committee rooms, vestry, &c. The plan, which is according to the model designed by the architect, Mr. Macgregor Chalmers, comprises a nave, with one side aisle, in which is the only gallery; a chancel for the choir and communion table, a side chapel, and an organ chamber. The interior will be finished in stone, the roofs will be of open dressed timber, and the halls will be finished in red pressed brick. The contractors are—Thomas Calderwood, mason; John Smeaton, joiner; Ingletton & Co., plumbers; M'Out & Sons, slaters; and Norman Macdougall, glazier.

FREE CHURCH, GLASGOW.—On the 18th ult. the memorial stone of the new Chalmers Free Church, which is being erected at the junction of Cavendish-street and Pollokshaw-road, was laid by Mr. David M'Lean. The new church fronts Pollokshaw-road with class-rooms and hall in a separate building a

the corner of Cavendish-street. There are side galleries over the aisles, also an end gallery, the seated accommodation being in all 840. In the front the central entrance is protected by a circular porch, the pillars of which are 22 ft. in height. The contents for the church and hall amount to 6,000l. The architects are Messrs. H. & D. Barclay, and the contractors are—Masons, Webster, Walker, & Webster; wrights, Allan & Baxter; plumber, Colin Turner; slaters, A. & D. Mackay; plasterers, Alex. Calder & Son; gasfitter, John Hunter; painter, John L. Duncan; glaziers, The Blythswood Stained Glass Company. Mr. Charles Wilton is the clerk of works.

SCHOOLS, BAPTIST CHURCH, WALKLEY, SHEFFIELD.—At a recent meeting of the trustees of this church it was decided to sanction the scheme put before the church by the architects, Messrs. Hemmell & Patterson, which will provide a school capable of holding about 400 children, and will increase the size of the church by about one-third of its present capacity, at an estimated expenditure of 1,300l.

CHURCH, WILTON, CORK.—The dedication ceremony of the church erected by the African Missionaries at Wilton, took place recently. The church consists of nave, chancel, transepts, vestry, and tower and spire. The principal dimensions are as follows—Nave 81 ft. in length, by 30 ft. wide; chancel, 30 ft. in length, by 17 ft. 8 in. wide; transepts, 30 ft. in length by 23 ft. wide. The walls are 20 ft. to wall plates, and 16 ft. 6 in. to underside of ridge. The nave is divided into nine bays. The chancel has an octagonal apse, and is lighted from the end of a 3-light tracery window, and at the sides by lancet windows. These and the 6 lights in transepts are filled in with stained glass. All the other windows are filled in with ornamental lead lights. The largest of the mosaic represents St. Joseph. On its right is a window representing St. Margaret of Scotland holding emblems, and on the left St. Elizabeth of Hungary is depicted. Three smaller windows are arranged on each side of the high altar. The group on one side represents St. Francis Xavier, St. Augustine, and St. Ignace; on the other St. Peter, St. Paul, a small window to the Virgin, and another to St. Aloysius, complete the lights of the sanctuary. The nave is divided from chancel and transepts by three arches supported on polished granite columns, with moulded bases and carved caps, and the chancel from the transepts by three arches on each side. The tower and spire is placed in the centre of the northern gable, and is 11 ft. square, and 90 ft. high to the cross. The lower portion is utilised as a porch, and upper stage as a belfrey. Over the porch there are two large lancet windows. These are surmounted by a cut stone tracery rose window, and a large arch is provided between the tower and nave, so that these windows are visible from the interior of the chapel. The plans were prepared by Mr. D. J. Coakley, architect, Cork, under whose supervision the works were carried out. The builder is Mr. Scully, Cork, and the stained-glass was made by Mr. Watson, of Youghal.

SCHOOLS, PEEL, ISLE OF MAN.—Acting under the instructions of the Clothworkers' Company, Mr. T. W. Cubbon, architect, of Birkenhead, is engaged upon a scheme of educational buildings, &c., to be carried out in Peel, Isle of Man, in connexion with Christian's endowed schools. The scheme will include new elementary school buildings, also school for secondary education, including Science and Art Departments, navigation, cookery, manual, and other technical classes. Three of the existing schools are also to be altered and extended, and probably a keeper's house erected for the whole of the schools.

SCHOOLS, LLANGATTOCH.—The Llangattock National Schools, near Crickhowell, were reopened recently, after having been closed for repairs and alterations. The architect was Mr. Baldwin, Brecon, and the contractors Messrs. T. Jones & Sons, Llangattock.

VOLUNTARY SCHOOL, SWAYTHLING, HANTS.—The foundation stone has just been laid of new voluntary schools, Swaythling. The new school is intended to accommodate 150 children, and will be used for infants, provision being made for the erection of larger schools later on. The infants' school will include one large room, class-room, and cloak-room, and will be built of red brick. The architect is Mr. H. J. Weston, of Southampton, and the builders are Messrs. Dyer & Sons.

ALEXANDRA THEATRE, STOKES NEWINGTON.—The latest addition to the suburban theatres is that nearing completion in the Stoke Newington-road. The theatre is being erected for Mr. W. Purcell St. John, by the designs of Mr. Frank Matcham. The site is an almost isolated one, thus giving an opportunity of providing more than the ordinary number of exits. A unique feature of the building is that the upper circle is raised at the back of the dress circle, thus forming a corridor with entrance at the sides and centre of the dress circle. The pit is on the street level and there is also a commodious gallery. Each part of the house has a separate entrance and an additional exit. The staircases and corridors are fireproof and all doors are fitted with alarm exit bolts. Large well-ventilated saloons and retiring rooms, heated by hot water, are provided for each part of the house. Hydrants abound in convenient positions, and there is an asbestos and water curtain provided for the proscenium, forming a fire-

proof division between the stage and the auditorium. The auditorium is decorated from the architect's designs, by Messrs. Dejong & Co., in Elizabethan style. The electric lighting is by Messrs. Barclay & Co., under the superintendence of Mr. Wingfield Bowles. The principal frontage to Stoke Newington-road is of a bold Italian style, in red brick with stone dressings.

THEATRE, GLASGOW.—Externally, the buildings which contained the old Scotia Music Hall have undergone little alteration in the reconstruction which has been going on for some months past, but the internal arrangements have been very much altered. Throughout, there is seating accommodation for about 2,300. The circle and stalls are entered by an entrance 10 ft. wide, leading from Stockwell-street, and the other parts of the house are entered from the side street. Two exits are provided for each tier of seats, and refreshment rooms are provided for each floor. The dome roof which covered the entire hall has been preserved by the architect, but about a dozen iron columns which supported it have been removed, and it is carried instead on iron trusses springing from the walls. An installation of electric light has been fitted by Messrs. Claud Hamilton, Limited. The plastic decorations are by A. R. Dean, Limited, of Birmingham. Mr. William Hope and Mr. J. C. Maxwell are the architects. The finishing and upholstery are by Mr. S. S. Dawson, of Newcastle-on-Tyne. The old stage has been brought forward some 12 ft., and now gives a space of 42 ft. by 80 ft.

THE "METROPOLITAN" THEATRE OF VARIETIES, EDGWARE-ROAD.—This hall has been rebuilt from plans prepared by Mr. Frank Matcham, and accommodation will be provided for an audience of 2,800. Above the fauteuils, stalls, and pit on the ground level is the balcony, and higher still is the gallery, which has room for from 800 to 900 persons. The decoration of the ceiling of the auditorium includes representations of English, Indian, French, and Spanish festivals and merry-making, illustrated by fifty or sixty life-size figures, painted by Mr. J. M. Boekbinder. The stage has been enlarged, and the accommodation for the artists has been improved.

ST. ANDREW'S FREE CHURCH HALL, Ayr.—This building, which has just been opened, is attached to the church buildings. The hall is 43 ft. long by 28 ft. wide and 19 ft. high, and is made to accommodate 250 persons. The contractors were—Mr. John Miliken, mason work; the trustees of the late William Drinnan, joiner work; Messrs. Drinnan & Murphy, plumber, heating, &c., work; Messrs. Leggat & Sons, plaster work; and Messrs. Bennett & Sons, painter work. The architect was Mr. William McClelland.

FREE CHURCH HALL, THORNTON, FIFESHIRE.—This hall, which has just been opened, has accommodation for 210 sittings. The hall has been designed and the work superintended by Mr. William Williamson, jun., architect, Kirkcaldy.

PROPOSED WORKMEN'S COTTAGES, BASLOW, DERBYSHIRE.—Mr. W. E. Mead, King-Mansfield, C.E., one of the Local Government Board Inspectors, recently held an inquiry at the National School, Baslow, respecting the application of the Baslow and Bunnell Urban District Council for sanction to borrow 2,000l. for the erection of twelve workmen's cottages. Mr. C. E. Dawson is the architect for the cottages.

ARCADIA, CARDIFF.—In addition to the number of arcades in Cardiff has been made recently in "The Central Arcade," which runs through from St. Mary-street (not far from the station end) to the Hayes. At the entrance are a pair of shops, and within the arcade there are twenty-nine shops on the ground floor. Each shop is provided with upper rooms for storage or show-room purposes, and a set of offices in the basement. The general construction of the arcade is in local stock brick, carried on iron and steel columns and girders. Mr. Edwin Seward was the architect, and Messrs. E. Turner & Sons are the builders.

WORKHOUSE, WILLESDEN.—The Board of Guardians for Willesden have adopted block plans submitted by Mr. Saxon Snell, their architect, for a new workhouse and infirmary in Acton-lane, Harlesden. The buildings will occupy about a fifth of the sixty acres purchased, and the general scheme is based upon the lines of the Mitcham workhouse, each block being detached from the remainder, with space all round for enlargement. The cost, it is stated, will exceed 50,000l.

LADIES' COLLEGE EXTENSION, CHELTENHAM.—The new examination hall in connexion with this building will shortly have been completed. The work is being carried out from the designs of the architect, Mr. E. R. Robson, F.S.A., London, by Messrs. A. C. & S. Billings. The total cost of the building, apart from the electric light installation, furniture, and fittings, will be about 20,000l. The heating is by Messrs. Marshall, the electric light by Mr. A. G. G. The clerk of works is Mr. Leach.

REBUILDING OF THE SHEFFIELD ATHENÆUM.—This building is to be rebuilt from the plans of Messrs. Flockton, Gibbs & Flockton. The enlarged site includes the present Athenæum and the whole premises, with right of light to Mulberry-street. It is intended to utilise a small part of the ground floor towards High-street for sale-shops, with an arcade running into Mulberry-street. The entrance to the

new club will be in the middle of the front, with an outer porch, a large inner hall, and a wide staircase. To the left there will be two reading-rooms. The library is to be on the right, where also is to be the ladies' department, comprising, in addition to a reading-room, a dining-room and lavatory. The whole of the first floor is to be devoted to the principal rooms of the club. The dining-room will be at one end of a corridor, with windows into George-street and Mulberry-street. This will be 42 ft. by 27 ft., and 14 ft. high. At the high-street end of the corridor is to be a billiard-room to accommodate two tables. Other rooms opening out of the corridor will be a smoke-room, a private dining-room, and a card and chess room. Opening from the principal staircase will be two dressing-rooms and a bath-room for the use of the members. The kitchens will be on the second floor, where also will be the steward's department, and accommodation for the servants. An additional story will be erected at the back for the use of the men servants, and as a laundry. The building is to be of brick, with stone dressing. The total cost, including furnishing, is likely to be about 10,000l.

CO-OPERATIVE STORES, SCUNTHORPE.—The Scunthorpe Co-operative Society have just opened an extension of their business premises on the Winterton-road. The new buildings have been erected at a cost of 1,000l. The premises are heated by Mr. Metcalfe, of Doncaster. The architect has been Mr. F. W. Masters, of Doncaster, and the contractor was Mr. J. Close, of Scunthorpe.

TEMPLE MISSION-ROOM, BRISTOL.—The new mission-room of Temple or Holy Cross Church has been designed by Mr. W. V. Gough. The building has been built of brick, and the block comprises a hall to accommodate about 300 people, with a retiring-room attached. There are two class-rooms. Beside the large hall is a residence for the caretaker. The building is of Gothic style, and is faced with brick inside, whilst the traceried windows are filled in with ornamental glass.

CONSERVATIVE CLUB, LEE MOUNT, HALIFAX.—A new Conservative Club has just been built at Lee Mount. Mr. J. F. Walsh, architect, of Halifax, was entrusted with the preparation of plans. Advantage has been taken of the natural fall of the ground to form a lower floor level to Campbell-street. This space is occupied by a caretaker's house, a public entrance to the club-rooms, supper-room, cooking kitchen, servery, ladies' and gentlemen's cloak-rooms and retiring rooms, heating apparatus, and bath-room for the use of the members. The assembly-hall is approached by a wide flight of steps from the lower level, with an extra entrance on the north side of the room, and also from the club premises. The assembly hall is 36 ft. by 68 ft., and provides sitting accommodation for over 500 people. The supper-room is 25 ft. by 36 ft., and there is accommodation for upwards of 100 people. The club entrance is in the centre of the site in Whentley-lane. The club premises consist of a reading-room, 30 ft. by 20 ft., a committee-room, and a bar on the ground floor. On the first floor there is a three-table billiard-room, a games-room, with lavatories and conveniences. There is a hall and vestibule at the members' entrance.

HALL, HIGHER BEBINGTON, CHESHIRE.—The Victoria-hall, which has been erected as a reading and recreation room for the villagers of Higher Bebington, was opened on the 20th ult. The present accommodation provided consists of two class-rooms for technical instruction, entrance-hall, and the hall, which latter affords accommodation for some 350 seats and a stage. The present building has been carried out at a cost of about 1,400l., and it is so planned that a future extension in the shape of class-rooms, retiring rooms, and caretaker's rooms may be added. The general contractors' work has been carried out by Messrs. Lee & Son, of Higher Bebington, under the direction and from the designs of Mr. Charles E. Deacon, architect.

THE BUILDING TRADE IN AUCHTERARDE.—The building trade of Auchterarder is at present in a very animated condition, many new buildings being in progress as well as additions to existing buildings. The Railway Hotel, which was burned down a few months ago, has now been thoroughly gutted and enlarged. The following are the contractors:—Mason work, P. Anderson, Auchterarder; joiner work, Mr. McGregor, Blackford; plumber work, Frew & Sons, Perth; plasterer work, John McKay & Son, Perth; slater, Mr. James Buchanan, Perth. Plans were prepared and the work is being carried out by Mr. J. Smart, architect, Perth. Another building in course of erection is a double villa for ex-Provost Hally. The contractors are:—Mason, Mr. P. Anderson; joiner, Mr. James Martin; slater, Mr. A. Dewar; plasterer, Mr. R. Hobson—all of Auchterarder; plumber, Mr. James MacLeish, Perth. The plans were prepared and the whole work is being carried out under the supervision of the same architect.

NEW POST-OFFICE, LISKEARD.—A new post-office has just been opened at Liskeard. The architect was Mr. J. Sansom, of Liskeard, and the contractors were Messrs. Hobbs & Bartlett, of Rilla Mill.

CHOIR STALLS, PARISH CHURCH, LYDD.—In the chancel of this church new choir stalls have been placed. The stalls are of oak, upon oak platforms. They include also seats for the clergy and prayer

desks. The old fourteenth-century finials which adorned the chancel stalls of that period have been used. At the Reformation, or possibly later, these finials were removed and served to decorate the old pews of the Bailiffs, Jurats, and Freemen of Lydd. They are richly ornamented with old gold and crimson colouring. Upon the resetting of the church in 1887, at the suggestion of the Honorary Secretary, the finials were reserved by the architect, Mr. J. Oldrid Scott, to be possibly some day replaced in their original position. The work has been carried out by Mr. Thompson, of Peterborough, under the direction and from the plans of Mr. J. Oldrid Scott.—*Kentish Express*.

PROPOSED CASUAL WARDS, CROYDON.—The Croydon Board of Guardians are proposing to erect new casual wards on the cell system, from the plans of their Surveyor, Mr. F. West of Croydon.

BUSINESS PREMISES, DORCHESTER.—New offices and stores have been erected in St. Thomas-street, Dorchester, for Messrs. J. Groves & Sons, Limited. The contract for the new building was carried out by the late Mr. A. H. Green, Blandford; the carving by Messrs. H. Hems & Sons, Exeter; and the architects were Messrs. Crickmay & Sons, of Weymouth and Westminster, S.W.

ALTERATIONS, &c., TO THE ROYAL HOTEL, BRADFORD.—The Royal Hotel in Darley-street, Bradford, has been remodelled and redecorated. The improvements to the hotel have been carried out by the following firms, acting under the instructions of Mr. J. Ledingham, architect, the original designer of the building:—Messrs. Christopher Pratt & Sons, Bradford; Messrs. Lund & Reynolds, Keighley; Messrs. Maple & Co., London; Messrs. Alfred Whitehead & Co., Leeds; Messrs. Edmondson and R. Bennett, Manchester; Messrs. R. Turpin & Co., London; and Mr. G. A. Steinthal, Bradford. Mr. S. Hull has acted as clerk of works.

HOUSE FOR THE SOCIETY OF ST. JOHN THE EVANGELIST, DARTMOUTH-STREET, WESTMINSTER.—We learn that the Cowley Fathers intend to open in Westminster a branch house of the Society of St. John the Evangelist, and that they have bought four houses in Dartmouth-street. Their new buildings, designed by Mr. Henry Wilson, of Gray's Inn-square, and estimated to cost 9,000l., excluding furniture and chapel fittings, will comprise a mission chapel, having a separate entrance and a capacity for 140 persons, cells, refectory, library, and another small private chapel.

BUILDING TRADE, EDINBURGH.—The building trade has been very busy during the year. Masters and men were alike fortunate in that the spring was generally an "open" one, and, save for the delay caused for a few weeks by the strike of the masons for an eight hours' day, work has gone on without interruption. The result of the strike was a concession of the men's demand. According to the agreement, the eight hours' day should begin on February 15, 1898, but as yet nothing has been done regarding the inauguration of the new system.

When the demand was granted, the men were earning 10d. and 10s. an hour; since then, in most places, the pay has been reduced to the standard rate, 9d. Besides, the masters have lately purchased machinery to do stone sawing and dressing equal, it is said, to a displacement of 200 men. The consequence is that in some quarters it is expected that the men, seeing the demand for their labour is less and that their rate of pay is reduced, will not insist on an eight hours' day, but will prefer to work nine hours, as now, in order that their weekly wage may be more than it would be if the shorter day were in operation. Besides the large number of tenements, villas, and continuous self-contained houses erected, a considerable amount of public work has been done in connexion with the Waverley Station and North Bridge, and new North British Railway offices, the reconstruction of the Royal British Hotel, the foundations of the North British Railway Company's Hotel, additions to the electric light station, large works at Carson-street, the building of new premises for several assurance offices in St. Andrew-square, the erection of cable-power stations at Tollcross and Shrubhill, additions to the Advocates' Library, a new laundry at the Royal Infirmary, police stations at the Pleasance and at Croft-an-Righ, the public shelter and golf greenkeeper's houses on the Braid Hills, and preliminary work for the extension of the Municipal Buildings. The briskness among masons and joiners has, of course, been shared by the allied trades—plasterers, painters, gasfitters, &c., and what with this building boom and the great amount of out-door labour required at the Waverley Station and the cabling of the tramways, the unskilled labouring class has also enjoyed a large share of the year's prosperity. Electrical engineers have also been very busy. The extent of the work for last year may be appraised from the number of warrants, &c., granted in the Dean of Guild Court. These numbered 1,100, which is a great increase over any year during the last five years. They represented 99 villas, 120 self-contained houses, 104 tenements with 138 shops, and 2,183 dwelling-houses, 182 public and other buildings, and 319 alterations. As to the prospects for next year, there is the City Hospital at Colinton Mains, not yet above the level of the ground, the new City Chambers, the extra pavilion at the Royal Infirmary, the North British Railway Company's Hotel, and probably a new central station for the Fire Brigade.—*Scotsman*.

BUILDING IN BARRY, GLAMORGAN.—At a recent meeting of the Public Works Committee of the Barry District Council, a large number of plans of additional houses and shops were received, and those found on examination to be in accordance with the by-laws were ordered to be passed. These included additions to the Barry Intermediate Schools; nineteen houses at Gaen-street and Lewis-street, Barry; thirty-six cottages for the Pencroire Building Company; twelve houses at Palmerstown road; and four shops in Holton-road.—The Surveyor (Mr. J. C. Pardoe) was empowered to engage additional assistance, inasmuch as he had now plans in preparation for the proposed swimming baths and parks, smallpox hospital, and infectious diseases hospital respectively, besides the ordinary work of the department. Amended plans of the fire-engine station to be built at Barry Dock were submitted by the Surveyor. Without entering into a discussion upon their merits, the committee decided to refer them to a sub-committee to consider the various details.

SANITARY AND ENGINEERING NEWS.

SEWAGE SCHEME FOR GOLCAR AND LINTHWAITE.—At the Golcar Urban District Council Room on the 21st ult., Mr. Herbert H. Law, Local Government Inspector, held an inquiry into an application by the Urban District Councils of Golcar and Lintthwaite for sanction to borrow 12,148l. for sewerage works, and 24,000l. for sewage disposal works.—Mr. J. H. Hanson, C.E., gave evidence in support of the scheme.

SEWAGE WORKS, HEYWOOD.—On the 18th ult. the new sewage purification works at Botany Bay, which have been constructed by the Heywood Corporation, were opened by the Mayor. In a description of the works the engineer, Mr. James Diggle, states that the total cost of the works to date, exclusive of land purchases and the culverting of Wrigley brook, would be 34,180l. 7s. 6d. The general contract for the builders' portion of the works was let to Messrs. Townsend, Watson, & Gates, of Sheffield, in July, 1894, and the remaining contracts were given out as follows:—Phoenix Foundry Company, Derby, steel girder bridge, viaduct, iron and steel work; Goddard, Massey, & Warner, Nottingham, pressing plant and machinery; C. E. Firmstone & Brothers, Scourbridge, iron pipes; Staveley Coal and Iron Company, Staveley, iron pipes; S. S. Stott & Company, Haslingden, screening apparatus, water-wheel, iron staircase, &c.; John Wolstenholme, Radcliffe, penstocks; and Glenfield Company, Kilmarnock, valves. The main outfall sewer is constructed of brick, egg-shaped, and is 4 ft. 6 in. high by 2 ft. wide, and the outfall tower and house are situated on the southerly side of the approach road, near to Peel-lane. It contains the necessary appliances for intercepting the sewage from the main outfall sewer and for conveying the same to the works by means of an adjustable cast-iron leap wire arrangement, 8 ft. long and 2 ft. wide. The tower is "oval" shaped, 16 ft. long, 8 ft. wide, and has a total depth of 35 ft. It is constructed with bricks set in cement, the walls being faced with Staffordshire blue bricks, and 3 ft. thick at the bottom. The main outfall sewer discharges its entire contents into this tower, and the sewage passes through a screening and raking apparatus driven by means of a ½ nominal h.p. vertical gas engine, which is fixed in the house erected upon the top of the tower. The screen is 8 ft. wide by 6 ft. deep, and is fixed near to the bottom of the tower on a level with the invert of the outfall sewer, at an angle of 60 deg. A 36-in. cast-iron main outfall sewer commences in the outfall tower, and is laid under the approach road to the steel girder bridge. The sewer is thence continued across the river Roch, and the steel viaduct, by means of strong steel straps, supported from the underside of the steel girder bridge and viaduct, and terminates in a pipe which discharges as required upon the water-wheel, or in the screening chambers at the end of the viaduct. The approach road is formed and paved upon a ballast foundation with 7-in. grit setts, the joints being grouted with oil and pitch, and the road has a gradient of 1 in 15, with footpaths 4 ft. wide on either side. The steel girder bridge crosses the river Roch at an elevation of 26 ft. above the level of the river, is 24 ft. wide, and has a span of 80 ft. 9 in. The bridge is supported upon stone piers erected on either side of the river, with concrete foundations. The steel viaduct is 245 ft. long, 24 ft. wide, and 17 ft. 6 in. above the surface of the ground, and is supported upon steel columns with wind bracings. The road over the viaduct is paved with wood blocks laid on concrete, and the space under the viaduct is utilised for sludgepressing purposes, stores, and workmen's room. The precipitation tanks are six in number, each 75 ft. long, 30 ft. wide, and 8 ft. deep, containing in the whole 675,000 gals., or about one day's dry weather flow of sewage. The tanks can be worked upon the quiescent or continuous flow system, but it is proposed to adopt the latter. The necessary penstocks, floating arms, &c., have been fixed, and provision made for passing the sludge direct from the tanks into a culvert, and from thence into a sludge-well constructed under the engine-house. Arrangements have also been made for passing the precipitated effluent direct from the tanks upon the land, or to the artificial filters as required. The filters are

twelve in number, each to fit 9 in. long, 16 ft. 4½ in. wide, 6 ft. deep. The filtering medium is 4 ft. 3 in. deep, and consists of coke, engine ashes, and sand.

SEWAGE PURIFICATION WORKS, LOANHEAD, EDINBURGH.—The new sewage purification works of the burgh of Loanhead were opened on the 16th ult. During the proceedings, Mr. A. W. Bell, C.E., Edinburgh, gave an explanation of the undertaking. He stated that formerly the drainage from Loanhead flowed into the May and Wading burns, but objections were raised, and the Commissioners consulted his firm, who advised them to adopt the international system of purification by precipitation and filtration, which has been carried out. Owing to the situation of Loanhead, it was necessary to have two different outlets, and this necessitated two sets of tanks, &c. New pipe sewers have been laid throughout the whole of the burgh, the old sewers being retained for road and surface water, which is not taken into the new system, but is discharged into the burns as formerly. The works have been carried out at a cost of about 4,000l.

STONEHAVEN WATERWORKS EXTENSION.—At a special meeting of the Stonehaven Burgh Commissioners recently, offers were submitted for an extension of the water and sewerage works, when the lowest estimate, by Mr. William Smith, jun., builder, Stonehaven, amounting to 1,377l. 6s., was accepted. The larger proportion of the work consists of a low service reservoir, situated within the burgh, in a retired piece of land lying between the Slug-road and the Station-road. The reservoir is to be built of concrete, and will contain 164,000 gallons of water. The engineers for the works are Messrs. Jenkins & Marr, Aberdeen.

SEWAGE WORKS FOR URMSTON AND FLINTON.—Colonel W. Langston Coke, Inspector to the Local Government Board, opened an inquiry at Urmston, on the 21st ult., with reference to the application of the Urmston District Council to borrow 2,700l. for works of sewage disposal. The Barton Rural District Council also sought, on behalf of the parish of Flinton, to borrow 1,300l. for a similar purpose. Mr. C. C. Hooley, surveyor, who explained the nature of the works, said that the sewage farm for the joint drainage district of Flinton and Urmston was situated in the former parish, and the sewage was treated by filtration. The district was very flat. There was only one manufactory in the district, and there was no effluent from breweries or dye-works to be treated on the sewage farm. The effluent from the farm, after being diluted, would be discharged into the Ship Canal. There was no opposition, and the Inspector afterwards visited the sewage farm.

PROPOSED NEW BRIDGE AT HADDINGTON.—At a meeting of the Town Council held on the 20th ult., plans were submitted by Sir William Arrol & Co. for a proposed new bridge over the Tyne at Haddington. The bridge is estimated to cost 7,500l., exclusive of approaches.

STAINED GLASS AND DECORATION.

WINDOW, BYFIELD CHURCH, NORTHAMPTONSHIRE.—A new stained glass window, replacing the remaining plain glass window in what is known as the Trafford aisle in Byfield parish church, has just been put in. The window consists of three lights. The left-hand light contains the figure of the Apostle St. Thomas; the centre light represents St. Ann, attended by the Virgin Mary; the right-hand light is a figure of St. George and the Dragon; while the small figure above the centre light, filling the top portion of the window, is emblematic of the Lord in Glory. The work has been executed by Mr. Kemp.

WINDOW, KIDDERMINSTER PARISH CHURCH.—On the 22nd ult. a special service was held at the Parish Church, Kidderminster, to commemorate the fiftieth anniversary of the restoration of the building, and to dedicate the memorial windows to the memory of the late Bishop Claughton. The memorial windows are the work of Messrs. Hardman & Co., of Birmingham. All the clerestory windows have been filled with stained glass, the series representing the canticle "The Benedict." In each light is the figure of an angel holding an emblem of the "works of the Lord."

FOREIGN.

FRANCE.—M. Alfred Normand, Member of the Institute, has just been elected President of the Société Centrale des Architectes, for three years. MM. Etienne and Duchételet have been elected Vice-Presidents; MM. Lalanne and Corroyer, Censeurs; MM. Raulin, Wallon, Bonnier, A. Hermant, Charles Garnier, Yvon, and Roux, Members of Council; MM. Boleau, Foyatier, and George, Secretaries; M. Bartaumeux, Secretary; and M. Frantz Jourdain, Keeper of the Records. The Ministre de l'Intérieur has just returned with a good report of the metropolitan railway, which will be officially submitted to the Conseil d'Etat in a few days. The municipality of Saint Quentin is about to rebuild the Ferragus Palace, which is connected with the Mairie, the Museum, Library, and Palais de Justice. This work, which is quite necessary owing to the age of the building, has been the object of a public competition, and will cost about 2,320,000 francs. M. Roy, architect,

has been commissioned by the Government to carry out the restoration of the Church of St. Léonard (Haute Vienne). This building, which is classed amongst the monuments historiques, is one of the most interesting churches in the centre of France. It dates from the twelfth century, and has already been several times restored—in the thirteenth century and in 1484. It is built on a curious crypt, containing fourteenth century statues, a fine bas-relief in alabaster, and is surmounted by a beautiful Romanesque clock tower. The work of restoration is estimated at about 90,000 francs.—M. Leloux has been elected architect of the future Gare d'Orléans on the Quai d'Orsay.—The Conseil Général de la Seine has adopted the principle of having an annual competition, open to all architects, for the building of dwelling-houses which shall contain the best sanitary and hygienic conditions at a moderate price.—M. Vaudremer and Dieulouf have presented a design for a Palace for the 1900 Exhibition, to the Commissariat General of Persia, which has been accepted.—As the Builder has announced, the Conseil Général de la Seine has voted the opening of a competition for the decoration of the Salle des Fêtes at the new Mairie at Vincennes. The competitors are to confine themselves to views taken in the neighbourhood of Vincennes. The Council has also commissioned M. Henri Dupray to paint two large historical compositions for the grand staircase in the same building.—There has just been a solemn inauguration of the Cathedral of Tunis. The building, which is of white marble, is by M. Bonnet, architect, of Toulouse, and is situated on the beautiful promenade facing the Residency.

ARCHITECTURE IN AUSTRIA DURING 1897.—Austria has been curiously inactive during the past year, as far as large public works are concerned; but, on the other hand, numerous schemes for smaller buildings and general works, have been under consideration, and the coming year will probably see a strong revival in the building trade. The only piece of architecture of considerable importance which has progressed materially during the past twelve months is the great Palace for the Emperor, which is now nearing completion. It will form part of the old Hofburg, and stands opposite the Imperial Museums. The Castle was part of Semper's great scheme for the improvement of Vienna, but was designed by the late Baron Hasenauer. On his death, Messrs. Hofler & Grober carried on the work, and at present, on Herr Grober's resignation, the building is being completed by Herr Hofler. Of civil engineering work, the regulation of the waterways at Vienna, and the construction of the new metropolitan railway, are certainly the most important in hand, and considerable progress has been made with these, in spite of the damage which was done during the year by a serious flood. Of other public buildings, we can only record that the number of town halls and theatres for provincial centres has been on the increase, but none of these call for any special remark. The coming year is to see the Jubilee of the Emperor of Austria, and in connexion with this there is to be a large exhibition in the park, which will practically be partly an industrial and partly a common welfare exhibition. There is also considerable talk of a monument to the Emperor, and various schemes for some street improvements in the inner City to mark the event.

GERMANY.—The subjects for the annual competition for civil engineers, arranged under the auspices of the "Architekten Verein" at Berlin, will be a scheme to remodel the canals of Berlin, and a design for a large central station at Leipzig.—A bust of the well-known architect Schinkel is to be placed in the vestibule of the Old Museum at Berlin, and was unveiled with some ceremony last month. The sculptor is Professor Wiese. In the evening Herr Wallé gave a lecture on Schuler's work, and an exhibition of his drawings was opened.—The Centralblatt der Bauverwaltung contains a report on the progress made with the frescoes and sculpture works in the Berlin Houses of Parliament, which seem to be very satisfactory. A large number of artists have been employed on the work.—A travelling studentship in memory of Gottfried Semper has just been given by the Municipality of Dresden, and the competition for this "Stipendium" will be held under the auspices of the Municipality, who will be advised by assessors. The candidates must be Germans, and must have studied for some time at Dresden. The value of the studentship is 800l.—A new prison has recently been completed at Karlsruhe. It has the distinction of considerable architectural pretensions, and affords accommodation for 124 prisoners. Its cost only slightly exceeded 25,000l.—The competition for the design for a new Town Hall at Charlottenburg, near Berlin, was decided in favour of a design by Messrs. Reinhardt & Suessenguth, of that town, while the second prize was given to Messrs. Zaar & Vahl, of Berlin. There were no less than fifty-two candidates, the designs being of a high average, and the planning of the premiated designs is particularly clear, for a somewhat difficult site.—The limited competition for a new Town Hall at Dessau has just been decided in favour of a design by the same architects. There were thirteen invited competitors, and the assessors were Professors Ende & Wallot. The Town Hall had already been the subject of a general competition. The successful architects have the reputation of being Town Hall specialists.—Of other recent competitions of importance, one has

just been decided for some sculpture on the facade of the Town Hall at Karlsruhe. The first premium has been accorded to Professor Eyth. It is very rare that sculpture decoration for a facade is decided in open competition; only eleven designs were sent in.—The Town Hall at Dortmund has been entirely rehauled, at a cost of about 10,000l., and the works are to be completed within two years.—At Mannheim some large assembly rooms are to be erected, the principal hall being intended to accommodate an audience of 800. The Municipality are to take the matter in hand, and the expenditure is limited to 50,000l.—A new Municipal Library and Record Office has been completed at Cologne from the designs of Baurath Heimann.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ASSOCIATIONS.—The partnership between Messrs Wimperis, Arber, architects, of 25, Sackville-street, Piccadilly, has been dissolved as from June 1 last; the practice will be carried on at the same address by Mr. W. H. Arber, the member of the late firm, who has purchased Mr. W. H. Wimperis's interest in the practice.—Mr. W. W. Davis, county surveyor, has removed from Falcon-court to 13, John-street, Adelphi, W.C.—Mr. William Hunt, architect and surveyor, has removed from 5, York-buildings, Duke-street, Adelphi, to Donnington House, Norfolk-street, Strand.

BOLTON MASTER BUILDERS' ASSOCIATION.—The annual dinner, under the auspices of the Bolton Master Builders' Association took place on the 16th ult. at the Swan Hotel, about seventy gentlemen being present. Mr. J. H. Marsden, President of the Association, occupied the chair. The loyal and patriotic toasts having been honoured, Mr. Amos Atherton proposed "The National Association of Master Builders of Great Britain" and "The Lancashire Federation of Building Trades Employers." He referred to what took place at the Bristol Conference, which he attended as a representative from Bolton, and said it was shown during the proceedings that it was necessary apprentices should attend technical schools, and that the masters in those schools should be as practical as possible. By attending to these points it was contended that they would get a better class of workmen than at present. The conference was doing all it could to get federations of employers in all the shires of England. Mr. W. Townson, in responding, first referred to the expected settlement of the engineers' dispute, and said that the way the masters in that industry had met the men and managed the strike was an object lesson to employers in other branches of trade. He went on to say that those present knew very well they were harassed by inferior workmen who were members of the trades unions, and how they were harassed by legislative enactments. The need of these federated associations was evident to those who paid any attention to the matter. As they were aware, a Bill had been recently passed into law called "The Workmen's Compensation Act," but he was rather inclined to the opinion that most of them thought very little about it. It would, however, prove no light matter to them, as they would find out when it came into force at the end of June next. As an illustration of the meaning and scope of the Act, he mentioned that they had built a chimney of erection which was over 30 ft. high, and a brick fell upon a workman they were liable to pay compensation, but if the structure was 30 ft. or under they were not liable. This seemed absurd and ridiculous to him. To insure himself against the risks before him it would cost 11. or 30s. a week. He thought it would be much better if trade unions directed their attention to making the workmen better fitted for their employment. Mr. J. Ormrod proposed "The Bolton Master Builders' Association," coupling with it the names of the officers, making special reference to the services rendered by their secretary, Mr. Briscoe. The chairman said that they must congratulate themselves that during the year there had been no serious disputes with the men in Bolton, whilst trade had been fairly good. He regretted the fact that the master painters had left them and formed themselves into a branch of the National Master Painters, this, in his opinion, being a mistake on the part of the master painters of the town. Mr. F. W. Briscoe also responded. Mr. John Dickinson gave "The Mayor and Corporation of Bolton and Local Governing Bodies." Mr. Councillor Maginins and Cor. William Galsworthy. The other toasts included "The Building and General Trade of Bolton," and "The President and Officers of the Bolton Master Builders' Association."

METROPOLITAN ASYLUMS BOARD.—An ordinary meeting of the Managers of the Metropolitan Asylum District was held at the County Hall, Spring-gardens, on the 10th ult. Sir Edwin Galsworthy, the Chairman of the Board, presiding. The Works Committee presented plans of the chief office buildings to be erected on the Embankment site, and the architect's descriptive report. The architect's rough estimate of the cost of the new chief office buildings, including foot 8th ult. Sir Edwin Galsworthy, tower for the railway tunnel opposite, was 49,543l. The Committee recommended that the plans, which

have been prepared by Mr. E. T. Hall, architect, be approved and adopted, and forwarded to the Local Government Board for their formal sanction under seal. The recommendation was agreed to, and it was resolved to apply to the Local Government Board for a Provisional Order authorising the expenditure of 40,000, in respect of the erection of the new chief office buildings, and empowering the Managers to raise the amount on loan.

GLASGOW ARCHEOLOGICAL SOCIETY.—A meeting of the members of Glasgow Archeological Society was held on the 16th ult. Mr. John Honeyman presiding. Mr. T. L. Watson read a paper on "The Vaulting of the Lower Church of Glasgow Cathedral." He said that the purpose of his paper was to show that the design of the lower church was not of one period, but of several. The middle compartment was later than the aisles, and there was evidence that this part of the work was delayed in order to facilitate the completion of the Cathedral. When it came to be carried out as the Cathedral approached completion the original design was abandoned or modified, or a new plan adopted. The evidence of these facts was to be found in the mouldings, which indicated a considerable advance in the art of architecture. It was also to be found in the general design followed, which was decidedly later than that of the aisles, and the last evidence of it was in the springer stones of the vaulting, where it could be distinctly seen that the old plan was abandoned, and a new design engraved on old pillars. The respective dates of the construction were:—South-west compartment, 1100-1200; lower aisles, 1230-1240; upper aisles, 1240-1250; middle compartment, 1250-1260; and the vaulting over the stairs, east end, 1260-1300.—*Glasgow Herald*.

GLASGOW CORPORATION AND AMERICAN PIPES.—At a recent meeting of Glasgow Corporation, Councillor Shearer called attention to the fact that on a contract for water-pipes an American firm's offer was lower by 735s. than any other. Glasgow at that time was the centre of the industry, and twenty years ago hundreds of thousands of tons of pipes were sent away annually. Now only about a quarter of that quantity was sent.—Mr. P. G. Stewart asked if the committee had information as to the part convict labour played in the production of the American pipes.—Mr. Osborne (the convener) said it was alleged the iron was prepared by convicts, but the committee had no information.—Mr. Shearer said the American offer was for 12 ft. pipes, while the Corporation asked for 9 ft. pipes.—Mr. Stevenson pointed out that 12 ft. pipes were dearer to produce and more economical to use.—Baillie King remarked that there were a great many conditions with which the American firm could not do, and that the inspectors knew exactly the component brands of iron with which the pipes were produced, and flaws could be detected. They could not test the American pipes in the same way until they came here, unless they sent a man to America.—Mr. Osborne said the committee had not accepted the offer of the American firm because it was not according to the specification. The minutes were adopted.

NEWPORT BUILDERS' ASSOCIATION.—The annual dinner of Newport (Mon.) Master Builders' Association was held recently at the "King's Head Hotel." Councillor G. H. Llewellyn (Deputy Mayor) presided. The loyal toasts were given from the chair, and duly honoured. Mr. Dauncey proposed the "Town and Trade of Newport," and Councillor G. Morgan responded. Mr. S. B. Nassar, Ruler and Scribe, responded. Mr. E. A. Lansdowne acknowledged the toast. He congratulated the builders on having such an association. The rules were an excellent set, and the clauses had been most useful to him in carrying out his professional work. He had had an objection to some of them at first, but now he viewed them more favourably. Mr. T. Parry proposed "The Building Trade." He said that there were indications that the building trade of Newport was in a very prosperous state. It was stated at the last annual dinner that plans for some 800 houses had been passed during the year, but he thought that number had now been exceeded. The rateable value of the town in 1801 was 147l. 6s. 6d., and now it was 320,000l. Mr. J. Lintock responded to the toast. He remembered when there were only about five builders in the town, but now there were something like fifty, and they were all kept employed. Mr. E. Hartley gave "The Timber and Stone Trades," and Messrs. A. Billingham (Batchelor & Co.), T. Ford (Ford & Pickford), and Hayes (Bristol), acknowledged the toast.—Mr. F. R. Bates proposed the toast of "The Builders' Merchants," and coupled with it the name of Mr. John Davies (Bangor Wharf), who replied. Other toasts followed.

OLD ARCHITECTURE IN LIVERPOOL.—At the Liverpool Town Hall recently the second of the series of technical lectures, promoted by the Corporation, was delivered by Mr. Fred. M. Simpson, Professor of Architecture at University College, Liverpool, on "Old Architecture in Liverpool." In the course of his paper the lecturer said that the term "old architecture" was not intended to signify buildings with tumble-down walls, and ceilings cracked across the middle. Such a description more aptly applied to modern architecture. The term was meant to apply to any buildings erected before the

present century. There was a belief, held by many people, that architecture meant profuse and diffuse ornaments; and there was a widespread feeling, allied to the "penny plain and two-pence coloured" sentiment, that for a certain sum one could get merely a building, and that for a further cost one could get architecture. Such an idea was, of course, erroneous and, unfortunately, the impression affected building. The result of this was deplorable, for a two-fold reason—both practical and æsthetic. If the effects produced by old buildings were analysed, it would be found that they were entirely owing to the good proportions of the buildings, and the arrangement of wall and window space. Ornament, if judiciously applied, would add very materially to the effect of a building, whereas a too lavish use of it generally destroyed the object the architect had in view. Proceeding, he said that it was in the region of St. Paul's Church, Liverpool, that many of the most striking old houses in the town were to be found. Other notable old buildings were to be found in Islington and St. Anne-street. The great influx of trade in Liverpool at the close of the eighteenth century had caused an increase in the number of houses in the town, and many of these were still in existence. The lecturer then exhibited lantern slides of old houses in Seel-street, Kent-square, Parliament-street, Duke-street, Hanover-street, Dalby-street, Union-street, and Great George-square, and views of Wavertree Hall, Almshouses in Howitt-street, the Blue Coat School, the Cathedral, and the Town Hall. He drew attention to the sash-bars placed in the windows of the old-fashioned houses of later date. The modern window gave no more light than the old style window, and was certainly not so effective in appearance.

PERTH ARCHITECTURAL ASSOCIATION.—A meeting of this Association was held on the 22nd ult., when Mr. John Anderson read a paper on "Dean of Guild Court Procedure." Mr. Young, A.R.I.B.A. President, occupied the chair.

CAMBRIDGE UNIVERSITY.—It is stated that the Mercers' Company have voted a contribution of 1,000l. and that Mr. Beckover, L.L. of the county, has given 1,000l. to the School of Medicine and Surgery rebuilding fund. A report of the Sites Syndicate is approved whereby the present site of the (old) Anatomical School, with parts of the Pathological department and the Downing-street sites will be devoted to the new buildings in question, and the ground lately purchased from Downing College will be taken for a Law School, a Botanical Department, and a Museum of Local Archaeology and Ethnology. It has been further decided that the existing Geological Museum in Cockerell's (Library) buildings and some rooms in Sir G. G. Scott's buildings (King's Old Court) shall be given over for purposes of the University library. The Geological Museum had its origin in Woodward's bequest of his collection of English fossils, supplemented by the purchase in 1729 of his foreign fossils; the (old) Anatomical, Zoological, Botanical, and Mineralogical Museums were erected after Salvin's designs, on the site of the former Botanic Garden.

THE SANITARY INSTITUTE.—At an Examination in Practical Sanitary Science, held in Manchester on December 17 and 18, Mr. S. Barlow Bennett (Manchester) was granted a Certificate in Practical Sanitary Science.

THE CITY ELECTIONS.—In the election of representatives of City wards on the Court of Common Council last week, Mr. T. F. Rider, head of the firm Messrs. Rider & Son, builders, was elected in the ward of Cripplegate Within; and Mr. H. Dove, auctioneer and land agent, and son of Mr. F. J. Dove, head of the firm of Messrs. Dove Bros., was elected in Coleman-street ward.

RESTORATION OF CHURCHYARD CROSS, ST. JOHN'S, CARDIFF.—The restoration of this ancient work is to be carried out at a cost of 100l. A portion of the shaft, base, and part of the foundations remains, and the whole of the upper portion of the shaft and step will be new, worked out of Portland stone. The head of the cross will bear six figures, the Crucifixion being represented on one side and the Ascension on the other, the whole of which are surmounted by a canopy with pinnacles and crockets. The design is by Mr. C. B. Fowler, the architect under whose supervision the work of restoring the tower was carried out.

ELECTRIC LIGHTING.—A bill has been lodged for next Session of Parliament, the preamble of which sets out that great difficulty is experienced by electric lighting companies and local authorities who supply electricity, in providing sufficient electrical energy to enable them to meet the demands of consumers at certain times of the day, whilst the production by each separate company and local authority of sufficient energy to meet the maximum demands involves the expenditure of large sums of practically unproductive capital and results in the consequent enhancement of the price that has to be paid for the electric light. To surmount these difficulties the bill proposes to confer on one company power to erect generating stations on one central spot in Marylebone on the banks of the Regent's Canal, and from this point to supply electrical energy in bulk to any "company, body, or person," at such price and on such terms as may be agreed.

CAPITAL AND LABOUR.

THE PLASTERERS' STRIKE IN LIVERPOOL.—At the instigation of the Lord Mayor, a meeting of representatives of the Master Builders' Association and of the Plasterers' Operative Society was held at the Town Hall on the 20th ult. in connexion with the dispute which has existed for so long among the plasterers of Liverpool. There were present Mr. James Wood (President of the Master Builders' Association), Mr. Charles Tanner, Mr. Thomas Jones, Mr. W. C. Green, Mr. J. A. S. Hassall (Secretary of the Master Builders' Association), Mr. William Jackson, Mr. W. Baldwin, Mr. J. Crute, Mr. J. Griffin, and Mr. W. Morgan. The conference, which was presided over by the Lord Mayor, lasted about two hours. The various points in the dispute were discussed, but no decision was arrived at pending a meeting of the Master Builders' Association and of the Operative Plasterers.

PLASTERERS' STRIKE, NELSON AND DISTRICT.—A conference took place at Nelson on the 21st ult. between representatives of the masters and artisan plasterers in Nelson, Colne, Brierfield, and Barrowford. The operatives have been on strike in the towns named since May last, their application for an advance of wages from 8d. to 9d. per hour, together with a modification of the working rules, being refused. At the conference a settlement was arrived at by means of a compromise, the men agreeing to receive 8½d. per hour, and the rules being modified to the satisfaction of both employers and employed.

LEGAL.

A QUESTION OF ANCIENT LIGHTS: COOK AND TOWNSHEND v. THE LIVERPOOL CORPORATION.

THIS was an action tried before Mr. Justice Bruce at the Liverpool Assizes on the 20th ult., for an injunction to restrain the defendants from interfering with the plaintiffs' ancient lights by the building of the proposed museum extension and technical schools at the corner of William Brown-street and Byrom-street. An elaborate model of the premises in question and of the neighbourhood was exhibited in court by the Corporation.

Upon the case being called on, Mr. McCall, Q.C., said he was happy to say that his Lordship would not be troubled with this case. The parties had agreed upon terms, which it was not necessary to state, but they would be enforced by his Lordship's order if necessary.

His Lordship: You have agreed upon the form of the order?

Mr. McCall replied in the affirmative, and added that a note would be handed to the registrar.

We are informed that the terms of the settlement are that the Corporation agree to pay the plaintiffs 1,500l. and costs as between party and party.—*Liverpool Courier*.

A NOTTINGHAM ANCIENT LIGHT CASE SETTLED.

THE case of Crane v. The Nottingham Constitutional Club Company, Limited, was mentioned to Mr. Justice Romer in the Chancery Division on the 21st ult. It was an action for an injunction to restrain the alleged infringement of ancient lights.

Counsel now stated that terms had been agreed upon between the parties involving an injunction and the pulling down of so much of the defendant's building as interfered with the plaintiff's light.

ALLEGED OBSTRUCTION OF ANCIENT LIGHTS AT ABERAVON.

THE case of Jones v. Jones came before Mr. Justice North, in the Chancery Division, recently, judgment being delivered on the 21st ult., it being an action by the plaintiff, Mrs. Elizabeth Goodall Jones, claiming an injunction to restrain the defendant, a publican, from so building in the High-street, Aberavon, Glamorganshire, as to obstruct the plaintiff's alleged ancient lights and also the air coming to the windows of her house. The plaintiff also asked for a mandatory injunction to compel the defendant to pull down part of the building which he had already erected. The properties of the plaintiff and the defendant were separated by a narrow lane about 10 ft. wide, and the windows which the plaintiff claimed as being ancient lights were in the side of her house which fronted on to the High-street. The "Bea Inn," which was the property of the defendant, also fronted on the High-street, but it was the building which the defendant had erected at the rear, and which ran along this narrow lane, of which the plaintiff complained, she alleging that one of the walls interferred with the lights in question. The defendant denied that the lights were ancient. The plaintiff having rebuilt part of her building, one of the important questions in dispute was whether the windows in her new building occupied the same place as the windows in the old building.

Mr. Swinfen Eady, Q.C., and Mr. J. G. Wood appeared for the plaintiff; and Mr. Vernon Smith, Q.C., and Mr. Ingle Joyce for the defendant.

His Lordship, in giving judgment, said that this plan upon which the plaintiff brought her case was not proved to be accurate, and was not one on

DECEMBER 16.—29,777, Maughan and Ridley, a Window Sash Fastener.—29,785, T. Crawshaw and N. Blezard, a Geographical Modelling Table.—29,789, L. Myers and J. A.

Nicholls, Folding Metal Rules—29,811. M. Yaron, Earthmen's Pipes—29,846. C. Moore, a Ball Tap—29,853. J. Edwards, Plumbers' Tools—29,854. J. Howson, Fasteners for Window Sashes, &c.—29,855. F. W. Barrough, Sash Fasteners—29,859. C. E. Masterman, Self-Opening Whistles—29,861. O. Owens, Ranges and Fireplaces.

December 17.—29,868. E. Springborn, Oil Paint and Varnish—29,873. C. H. Fletcher, Shower-Bath Spray Producers—29,887. H. W. Harvey, Street-Lantern Grates—29,888. J. and J. Davison, Ladders—29,889. C. and W. T. Smith, Drawing Compasses—29,895. W. Bursian, Closed Stoves—29,901. F. Crisp, Dog-ended Curbs and Fenders—29,908. E. J. Pearce, Ventilators—29,910. J. V. Fallich, a Brush Drawing Pen—29,923. W. H. Witham, Cistern and Tank Water-supply—29,946. J. B. Chasseaud, Cleaning and Clearing of Soil and Waste Pipes, Sewers, Drain pipes, &c.—29,950. S. M. Innes, a Combined Cistern and Rule.

December 18.—29,969. J. M. Graham, a Window Fastening of Door Bolt—29,970. T. H. Stubbs, a Method of making Tiles or other Articles of Ceramic Ware with undercut or dovetailed indentations on the backs thereof—29,994. A. A. Russell, a Sink Attachment—30,010. H. Harrison, Brick-burning Kilns—30,026. Grunzweig and Hartmann, a Stone or Moulded Blocks of Kieselguhr or Infusorial Earth.

ACCEPTED SPECIFICATIONS.

Open to competition until February 22.

18969. McDougall, Methods and Apparatus for Water Purification—29,542. Draper and Others, Ventilating and Draught Promoting Fireplaces—(1897) 665. Pollaville, Apparatus for Heating or Cooling Buildings—983. Lynn, Head or Cowls Edgingways, Ventilating Shafts, &c.—2466. Fox, a Combined Sash-Grip and Safety Guard for Preventing Accidents Arising from Window Cleaning—3412. Shapcott and Brown, Fuel Carriers, &c.—2989. Shanks, Urinals. 9089. Wright, a Safety Appliance for Lifts—5518. Ryan and Others, Apparatus for Tying and Building Scaffolding—71303. Hergenhan, Process for Working Stone, Marble, Granite, &c.—Pliers, Sash Fasteners—23,627. Kjellström, Joining Cement Blocks, Pipes, &c.—22,572. Cottrell, Sanitary Earthenware Pipes—24,415. Volkswinkel and Volkswinkel, Spirit Levels and Instruments—29,925. Ferguson, a Method for Constructing and Dewatering of Buildings—26,956. Knobel, Stone-Sawing Machines.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 15.—By HEPPER & SONS (at Leeds). Leeds—King-st. &c.—a freehold building site, with the Hotel de Ville and other buildings thereon, area 817 yd. £30,000. By A. Dowell, Esq. Edinburgh, Ventilation, &c. (near) Argyllshire—The Estate of South Aros, area 2,700 a. £7,000. By THOMAS PARRY (at Newport). Myndyallwydd, Monmouth, &c.—Cefn Pennar Farm, 19 a. 17 p. 6 c. 1,300. "Penycroft Farm," 16 a. 3 r. 18 p. c. 7,050. By ALFRED RICHARDS (at Southgate). Southgate—10 a. 10 p. 6 c. 1,207. Chelmsford, a block of building land, f. 485. December 16.—By A. G. OLLEY. Kingston Hill, Surrey—Brunswick-road, "Selhurst" and "Penshurst," f. 263 a. 10 p. 6 c. 990. By WESTON & SONS. King's Cross—44, Collier-st., f. 181. 88. 425. Kennington—31, 33, 35, 37, and 39, Royal, f. 7,000. By WOOTTON & GREEN. Brompton—146, Little-rd., f. 394. 730. Peckham—Tilson-rd., i.g.r. 501, u.t. 644 yds. 715. By J. H. HARRARD & SONS. Bermondsey—Farncombe-st., i.g.r. 246, u.t. 24 300. Bethnal Green—9, Winchester-st., f. 236. 88. 225. Stepney—Duckett-st., i.g.r. 184, reversion in 84 yds. 750. By J. HARRARD & SONS. King's Cross—Providence-row, i.g.r. 104, 105, u.t. 93 yds. 100. Stoke Newington—55 and 57, Wellington-rd., u.t. 12 yds. 3 r. 36 p. 6 c. 715. Dalston—67, Colveston-cres., u.t. 663 yds. 395. 82, Sandringham-rd., u.t. 63 yds. 6 r. 61, r. 401. Highgate—24, North Hill, f. 182. 3,150. By C. C. T. MOORE. Spitalfields—Pauline-ter., f.g.r. 171, 105, reversion in 603 yds. 3,150. Whitechapel—107, 103, and 105, Hanbury-rl., and 33 to 44 (odd), Vallance-rd., f. 1,250. 1,250. Aldgate—1 to 10, Garden-pl., f. 204. 28. 2,700. 65, 67, 69, and 71, Middlesex-st., f. 1,500. 7,630. 20, 22, and 24, Coulton-st., with three warehouses adjoining, i.g.r. 421, 108, r. 4504. 7,000. Whitechapel—9 and 13 to 33 (odd), Old Montague-st. and 4 to 6, Frodo-st., with a warehouse in Finch-st., u.t. 123 yds. 4,150. By F. FARLOW (at Norwood). Norwood—Tudor-rd., "Pembury," f. 1,152. 1,100. Anerley—28, Beverley-rd., u.t. 671 yds. 301, f. 454. By THURGOOD & SON (at Bishop's Stortford). Langley, Essex—"The Lower Farm," 24 a. 0 r. 18 p. 6 c. 140. Two freehold fields, 13 a. 1 r. 20 p. 6 c. 180. "The Brick House Farm," 130 a. 1 r. 32 p. 6 c. 605. and c. Clavering, Essex—"Hill Green House" and farm, 470 a. 3 r. 30 p. 6 c. 2,900. Two pairs of cottages, f. and c. 180. By N. B. RAYMOND, Esq. (at Deal). Great Monaghan, Kent—Cherry-lane, six freehold cottages. 468. Deal, Kent—Telegraph-rd., a plot of building land, 3 a. 0 r. 2 p. 6 c. 390.

Waterworks-rd., &c., two plots of land, 4 a. 2 r. 3 p. 6 c. £205. Waterworks-rd., an enclosure of arable land, 5 a. 2 r. 0 p. 6 c. 350. 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000.

Waterworks-rd., &c., two plots of land, 4 a. 2 r. 3 p. 6 c. £205. Waterworks-rd., an enclosure of arable land, 5 a. 2 r. 0 p. 6 c. 350. 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000.

PRICES CURRENT OF MATERIALS.

PRICES CURRENT OF MATERIALS.		TIMBER (continued).	
Greenheart, B.C.	ton 8/00 6/00	Satin, Porto Rico	6/10 1/10
Teak, E.I., load 10 to 15	15/00	Walnut, Italian	6/10 1/10
Sequoia, U.S. 100 ft.	16 1/00	METALS.	
Ash, Canada, Kils.	3/00 4/00	Iron-Pig, in Scot.	2 5/4 0/00
Birch, do.	4/00 5/00	Bar, Welsh, in	5/10 5/10
Elm, do.	4/00 5/00	do. do. at works	5/10 5/10
Fir, Danstic, do.	4/00 5/00	do. do. at works	5/10 5/10
Gink, do.	4/00 5/00	do. do. at works	5/10 5/10
Canada, red	4/10 5/00	do. do. at works	5/10 5/10
do. yellow	4/10 5/00	do. do. at works	5/10 5/10
Lath, Danstic, fath	4/10 5/10	do. do. at works	5/10 5/10
St. Petersburg	4/10 5/10	do. do. at works	5/10 5/10
Wanston, Kils.	4/10 5/10	do. do. at works	5/10 5/10
Osessa, crows	7/10 8/00	do. do. at works	5/10 5/10
Deal, Finland	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
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do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
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2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
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St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
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2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
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St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
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St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
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St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
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do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
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do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
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St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
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2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
do. Kils.	7/10 8/00	do. do. at works	5/10 5/10
St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
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2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
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St. Petersburg	7/10 8/00	do. do. at works	5/10 5/10
at yellow	7/10 8/00	do. do. at works	5/10 5/10
2nd and 3rd std	7/10 8/00	do. do. at works	5/10 5/10
do. 4th and 5th	7/10 8/00	do. do. at works	5/10 5/10
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The Builder.

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JAN. 8, 1896.

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Cardiff Town Hall and Law Courts : Second Premiated Design, by Messrs. Gibson & Russell—	
Elevations and Sections	Two Single-Page Photo-Liths.
Plans	Double-Page Ink-Photo.
Detail Elevation and Section	Double-Page Ink-Photo.
Royal Academy Gold Medal Design : A Nobleman's Country House.—By Mr. Archibald H. Christie.	Two Single-Page Photo-Liths.

Blocks in Text.

Sketches of London Street Architecture. XXII. "The Yellow House," Bayswater-road. Mr. Ernest George, Architect.	Page 35
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Strikes and Statistic.



THE Report of the Chief Labour correspondent of the Board of Trade on Strikes and Lock-outs in 1896, which has just been issued, is of more than usual interest at the present time: it is in many

respects a year's chronicle of the relations between employers in every trade and their workmen, and it shows how important a place those relations hold in the contemporary history of Great Britain. The public generally see a short paragraph in a daily paper as to some trade dispute. It passes almost unnoticed before them, unless the dispute is of the largest dimensions. Yet these various disputes in the aggregate have a most notable effect on the trade and on the general prosperity of the country. This can very well be shown by taking the building trades; it is unnecessary to go further afield. We will give one figure, and a startling figure it is to begin with, and that is the aggregate number of working days lost in 1896 through disputes. They amount to 1,061,207. A group of figures such as this must not be regarded as a thing by itself. We must recollect that each of these days lost means wages lost, and then we are able to realise better what their real meaning is. It is impossible to say accurately what sum of money lost to workmen these figures represent, what amount of distress to families, and what indirect loss to tradesmen and suppliers of food and clothing all over the world. Trade battles which result in such losses as these may, of course, after a time have their recompense, so far as workmen are concerned, in a higher rate of wages. But it is doubtful if, in the present instance, there was such recompense. For of these lost days, in round numbers, 506,000 belong to disputes which ended in favour of the workmen, 472,000 in favour of the employers, and 82,000 to disputes which were compromised. These further figures appear to show that more than half of the days lost were, so to say, gone for ever; their loss brought in no

future gain. On the other hand, if we take the number of work-people who were affected—namely, 33,470—we find that of these, 19,000 odd were affected by disputes which ended in favour of the workmen, 10,000 odd by disputes which terminated favourably to the employers, and 3,000 odd by compromised disputes. The actual number of disputes was 205, and of these, 109 are apportioned to the first category, 55 to the second, and 41 to the third. In other words, at least one-fourth of the disputes in the building trade in 1896 ought not to have begun at all. What lesson is chiefly taught by these statistics? We think one stands out very clearly, and that is, that the utmost caution should be exercised in regard to trade disputes, and that strikes should not be commenced without the strongest possible reasons, since a victory which does not lead to very substantial results may be as disastrous as a defeat.

But there is another aspect of strikes, which these statistics bring before us, and that is the illegitimate action of trades-unions. Their primary object is to protect those who are members of them, and secure proper wages, proper accommodation in the works, and to act also as benefit societies. It is contrary to public policy and, in the long run, to the interests of their own members, for trades-unions to act aggressively in the effort to limit the freedom of those who are not trades-unionists. Attempts to do so are not always successful, and sometimes end in the discomfiture of those who make them. This Report affords some illustrations of this statement. Thus we find that a body of plasterers to the number of thirty-five strike because the employer had also in his service certain non-union men. It appears that, instead of the latter being discharged, the strikers were replaced by non-union men. Again, at Cardiff, eighteen masons struck for the same cause, and with the same result. In some cases pieces of most unreasonable tyranny are to be found. Thus, at Edinburgh, twelve masons struck in order to compel the employer's son, who was working as a stonemason, to join the union. The duration of this strike was from February 25 to March 9, and it ended by the employer withdrawing

his son from the work. No doubt, he was able to place him elsewhere. But can anything be more tyrannical than that an employer who has a son who is desirous of learning the technicalities of his business should not be allowed to give him the opportunity of doing so? For that, of course, was the long and the short of the dispute—that the employer's son should join the union was an absurd demand. Again, we find symptoms of old-fashioned prejudices worthy of the beginning of the century, where the agricultural labourers became riotous and destroyed machinery. For we find at Carlisle a strike against the introduction of ready-dressed stone; and at Oldham there was a strike of carpenters in order to obtain from the employer a written promise that he would discontinue the use of foreign-made joinery. In the first instance the strike was unsuccessful; in the second it was settled at a conference that foreign-made joinery should not be used in future. These instances show how trades-unions can be employed to hamper business, and how closely the views of their members conform in some respects to those of the most ignorant of mechanics.

It is impossible, of course, to add illustration to illustration. We have shown by facts how vicious in some respects is the action of trades-unions; how baneful even they may often become to their own members. At the same time it must not be supposed that this volume does not contain examples of the proper action of trades-unions—as, for instance, in forcing an employer in a district to pay the same rate of wages as other employers, or in obtaining proper shed accommodation, or in protesting against the dismissal of men without customary notice. Here unions are doing proper work, looking after the interests of their members in a legitimate manner, not trying to limit the freedom of action of non-unionists, or the freedom of employers in the choice of their workmen or of their materials. To these legitimate functions there is no doubt that the common sense of the English people will confine the unions, and statistics such as these before us are of the utmost value, since they afford vivid illustrations of the proper and improper working of these com-

binations of workmen, and show by practical examples the difference between the reasonable protection of trades-unionists and the injuring of non-unionists.

THE MILLAIS EXHIBITION.



THE collection of the works of Millais at Burlington House is of course the artistic event of the year. It has been said to be complete, as far at least as regards all the artist's most important works; but we miss two at all events, "The Knight-Errent" (which was recently, and perhaps is still, at the Guildhall), and the portrait of the little girl (Miss Thorpe) feeding two dogs with cakes out of a silver basket, which was one of the sensations of the Academy the year it was exhibited. The unfinished portrait of Lord Beaconsfield, also, is missing. *En revanche*, we meet with several early works which we had either not seen or had forgotten.

We can here, however, take a pretty complete survey of the life-work of the greatest English painter, taking him all round, of our generation, and a rather curious study it is. We seem to recognise four distinct Millais. There is the early tentative Millais, who from the picture of "Cymon and Iphigenia" (1848-51)—one of those we do not remember to have seen before—would seem to have been a pretty close student of Etty. Some small and probably early studies for pictures, undated, are of considerable interest, especially the one entitled "The Conjuror" (29), an exceedingly spirited little composition. There was the Millais who was what was then called "pre-Raphaelite"; painting pictures showing the most intense desire to grasp the heart of the subject, and full of splendidly-painted, though sometimes rather hard detail. There is the Millais who began to paint scenes of modern life, in a rather hard, realistic, and finished manner, and with a style and sentiment about them which was at the best "Philistine," and at the worst in danger of being vulgar; such works as the 1836 picture, "The Conclusion of Peace" (8), with its naive presentation of the average English middle-class materfamilias and the husband with an "educated whisker;" and the "Black Brunswicker," and the "Order of Release;" pictures dear to the British mind, popularised by prints in thousands and tens of thousands, and in which the artist, whether consciously or not, was certainly playing to the gallery. Then there is the fourth and final Millais, as we knew him (with occasional lapses) for many years, after he had discovered that the representation of the men and women of his day could be made the occasion for the finest artistic harmony of treatment and colour, and for the expression of character (where there was any to express) with a subtlety which few portrait painters have ever equalled.

Nevertheless, it is somewhat melancholy to compare some of the pre-Raphaelite pictures, their intensity of purpose and sometimes their poetic fancy, with the main work of the artist's mature period, in which the imaginative faculty played so small a part. More especially does one feel this in looking at that marvellous little work, "Ferdinand lured by Ariel," in which he has added something to Shakespeare's conception, and made us realise the fairy element in the "Tempest" as we never

realised it before. The personation of the voices, of which the island was full, by these strange filmy bat-like creatures, all eyes and mouth, is one of the most imaginative things in modern painting; and it is melancholy to think that the man who could do this should subsequently have come to painting, for money, the portraits of some of the utterly commonplace men and women who are to be seen here and there on the walls. The one weak point in the picture arises from the P.R.B. notion of truthfulness; he must have a real face to paint the Prince from, and the face shown is not that of a prince of high lineage. If he could deal with Ariel and the voices without models, he might surely have tried to create a Prince Ferdinand worthy of the rest of the picture; but it is a wonderful little work nevertheless. The "Lorenzo and Isabella" probably suffers to some extent from the same cause; the faces are all portraits got together into the picture, and they do not all suit the subject. It is interesting to see "The Blind Girl" under a new light. The defiant realism of the background of this picture moved people to ridicule when it was first exhibited; it does not strike one in the same way now, though the landscape still, one may say, presses on the figure a little, and the crows in the field, reckoning by linear perspective alone, are certainly too large in relation to the foreground figure. But the landscape is a remarkable representation of that kind of exceptionally strong light and sharp definition which seems to come over the face of the scene in a gleam of sunshine backed by a storm-cloud; and if it is studied with that recollection, it will be seen that it is not so much over-accentuated in detail as one is tempted at first to think; detail in a landscape comes out with extraordinary clearness and minuteness under those circumstances. "The Huguenot" we have always considered an over-rated work; the colour is not good, and there is a certain sentimentality about it; the faces have by no means all the beauty and depth of meaning which it is the fashion to attribute to them. We believe, however, that the artist concurred with the verdict of the public in thinking it one of his most remarkable productions.* "Sir Ysumbras" we confess does not gratify us altogether; we have still the feeling that there is a touch of the ludicrous about it; the landscape is fine. Another remarkable work which has been two or three times exhibited is the "Design for a Gothic Window" (in the "Black and White" room), with its figures of angels so architectonically worked into the lines of a kind of (not pure) Gothic tracery. This is more like a design of Blake's than anything we usually associate with Millais—in conception and feeling that is; Blake would perhaps have hardly confined himself so strictly within the lines of architectural decoration. And yet though this, as a piece of purely decorative design, stands alone among Millais' generally-known works, the feeling for that class of design seems to have been always with him had he chosen to employ it; for many years after he made a design for a book-plate which is one of the most original bits of decorative design in a

large work (we forget by whom) dealing exclusively with book-plates.

It is curious also that after having apparently relinquished ideal painting when he commenced producing such works as the "Conclusion of Peace," he every now and then would suddenly remind us that he could produce imaginative work if he chose. It is extraordinary to see hanging next to each other (was this done purposely?) two such pictures as the "Conclusion of Peace" and the "Vale of Rest," and to read their respective dates—1856; 1858! Is it possible that there are only two years between these two pictures, which seem a lifetime apart? And how is it possible that the man who could paint the latter could be content to paint the former? But the "Vale of Rest" is not a development since the date of the other picture; it is a return to the feeling of his earlier works, though with greater power of colour and greater concentration of effect. It is one of the most beautiful of all his works; a complete poem; an epitome in painting of the cloistered resignation ideal in life. How fine too, is the contrast between the weight-lifting figure of the girl with the spade full of earth, in such complete balance of action, and the calm seated figure on the right. The beauty of the evening sky too, and its perfectly aerial character, are to be noticed; and also that naive composition of horizontal lines one above the other, which reappears in the beautiful landscape "Murtherly Moss"; in the earlier work it may have been consciously adopted to give an effect of repose; in the later one it is apparently the result of the frank acceptance of the lines of the landscape as existing. "Autumn Leaves" (another surprise—painted in the same year as the "Conclusion of Peace"!) is often grouped with the "Vale of Rest," but is very inferior; it is in fact "sentimental," which the other is not; nor does one see why girls burning leaves should let their hair down and neglect to wash their faces. Nevertheless, there is a unity of conception about it which places it in a different rank from the contemporary Philistine pictures. "The Eve of St. Agnes" (1863), and "The Parable of the Tares," (1865), were again instances of looking back to an earlier ideal; and quite recently, after we had long got into the habit of thinking of Millais mainly as a portrait painter, he suddenly surprised us again, in 1895, with his striking and purely ideal picture of "Time." How one wishes that he would have had these lapses into idealism oftener, seeing that obviously it was not killed, but only put aside. In regard to the "Eve of St. Agnes," however, it must be observed that though this is a most remarkable study of moonlight effect in a room, and there is a dreamy poetic feeling about the scene, and the figure is very characteristic in itself (he made a careful study for it, which is hung in another room), Millais did not realise Keats's intention as to the figure "half hidden, like a mermaid in seaweed," when she let her "rich attire" slip down; Keats was certainly not thinking of a figure in stays and petticoat, and one cannot tell whether the painter's curiously prosaic reading of the subject was the result of prudery or want of perception.

The large collection of works belonging to Millais' final and longest period consists of pictures which are mostly tolerably fresh in all our memories, and concerning which

*When he made a present of his painting chair to the late Mr. G. Godwin, to add to his collection of famous chairs, Millais' recommendation of it was, "I painted 'The Huguenots' in that chair."

perhaps there is nothing new to be said. Among the subject pictures which are less familiar is the very graceful one of Rosalind and Celia in the Forest. Among figures which are not ostensibly portraits there are some which stand out especially for force and originality of character and fine colour; pre-eminent among such are "Stella" and "Vanessa", and the two child-pictures "For the Squire" and "Sweetest Eyes," in which the latter Millais appears, one may almost say, as another and a better Reynolds. In portraits it is characteristic of Millais that he was never so great as when painting the portrait of an eminent and important man, whose character or career may have interested him; and thus the portraits of Mr. Gladstone, John Bright, Lord Shaftesbury, and Sir James Paget, are completely typical of the men and their career; as much so as any of Mr. Watts's portraits, with the additional advantage of being admirable likenesses, which, as Mr. Collier says, is one of the objects of portrait painting. The portrait of Mrs. Heugh is one of the finest and most characteristic portraits of age that has ever been painted; and among feminine portraits that of the Duchess of Westminster may be adduced as the perfection of lady-like grace and dignity, and that of Mrs. Perugini, in a black dress and with her back to the spectator, just showing the profile of her face, as one of the most original and characteristic.

Among the landscapes, we do not consider that Millais' first effort, "Chill October," is a great landscape; it is a good one, but would hardly have attracted so much attention at its first appearance had it not been for the fact that every one wanted to know what Millais had made of landscape. The foreground is decidedly weak, which is curious, because in his other landscapes the foreground was often the strong point; in fact most of the landscapes (always excepting "Murthly Water"—a very weak thing) are really superior to "October." But the two that stand out as great landscapes, which will always retain their place in the art, are "Over the Hills" and "Murthly Moss." The latter may be thought a very quiet work to claim the epithet of "great," but it is so in the sense of having a complete unity of treatment and conception; there is not a disturbing element in it; everything is complete; and this is the case, though perhaps not to quite the same perfection, in "Over the Hills"; in their own way they are two masterpieces of landscape.

In the "Black and White" room there are various sketches by Millais, but very few of such separate and careful studies of figures for pictures as those which Leighton made. Was Millais not in the habit of making such studies? Or did he not keep them? One can hardly admit the former supposition, but it is curious that this element in his work should be so little represented.

NOTES.

The sad loss of life reported from Canada in connexion with the collapse of the floor of a hall at a public meeting at London, Ontario, should serve as a warning against having large assembly-rooms on the upper floor of a building. Quite independent of the increased risk from panic (whether caused by fire or otherwise) owing to the necessity of using staircases to reach the ground level,

there is also the risk of a fire occurring in rooms under the hall; or, as was the case in this instance, the risk of some structural defect, causing the collapse of the floor if loaded by a large audience. From the reports it would appear that while a number of people were killed and injured by the collapse proper,* a large number were also killed in the panic which resulted. Taken as a rule, large rooms for public assembly should be on the ground-floor level. This rule is, however, by no means observed or recognised by architects, and those who recollect the drawings of a certain recent competition for a town hall will remember that the hall of the successful design was placed some three floors above the street level, and though this, no doubt, afforded an excellent opportunity for a feature in the design of the elevation, the risk incurred by the public using the hall was obvious.

New York
and London
Fire Service.

The American Press has recently had a good deal to say about the London City fire, and naturally the Fire Departments of New York and London have been compared from the point of view of efficiency, the result of such comparison confirming what has been already observed, that London is not quite up-to-date in the "Fire-fighting" business. We are told, for instance, that our fire alarm system is totally inadequate, having only about one-tenth as much telegraph service as is provided in New York for communicating fire alarms to the various stations; and again, that notwithstanding the vastness of London, we have only about the same number of fire engines as are to be found in New York, and those we possess are very much smaller than the engines generally employed in America. It is stated that the water used by the London fire department averages twenty million gallons a year, which is only about half the quantity employed in New York, where the brigade consists of twice as many men as we have, and costs three times as much money to keep up as the London fire department.

An Attempt to
Regulate Archi-
tectural Design.

FOR some time past the grand-fatherly German authorities have been making attempts to control the design of buildings, quite independent of all questions of construction and compliance with the Building Regulations; and, if we are rightly informed, the authorities have used their influence in this direction in many localities, although their powers or the principles of censorship had not been defined. But now we hear from Munich that the design of business premises is to be subject to official approval, primarily on account of the recent disfigurement of the city by several buildings which show their lower two stories merely as a framing of plate glass. There has been considerable negotiation between representatives of the Building Act Department and delegates of the art circles, and certain principles have now been arrived at which will in future govern the design. As far as we understand these principles, the undecorated "pin," or support, will no

* The daily papers give a not very intelligible description of the beam which gave way, as "a heavy beam composed of twelve timbers, each 3 in. by 4 in., securely jointed together." We presume that what was really there was a wooden trussed girder; but it would be of some interest to get a technical description of the "beam," and the cause of its giving way.

longer be allowed. Some prominent architectural feature will be required between the plate-glass part of the building and the superstructure; and further, the authorities will require some harmony between the general design of the plate-glass part and its supports and the superstructure. In German professional circles these attempts to control the design of buildings are well received, as they are considered in the light of a stricture on the unsightly buildings with which the speculating builder has spoilt many of the historical old cities. It is a kind of regulation, however, which will require a great deal of tact and judgment to carry it out in a satisfactory or logical manner.

Meeting of the
Australasian
Association.

At the Sydney meeting of the Australasian Association for the Advancement of Science and Art, which was announced to commence on Thursday, the 6th inst., the following papers, among others, are announced to be read in the section of engineering and architecture:—"On Narrow-Gauge Tramways," by Mr. F. Back; on "The Grotesque Developments of Modern Picturesque," by Mr. Howard Joseland; "A Review of Some of the Conditions of Building Construction, and Requirements in Sydney Past and Present," by Mr. G. Allan Mansfield; "On the Use of Explosives in Connexion with Engineering Works," by Mr. C. Marchant; "Notes on the Use of Terra Cotta Lumber as a Fire-resisting Material in the Construction of Modern Fire-proof Buildings," by Mr. G. McKae; and "Is Australia in touch with Modern Architecture?" by Mr. W. L. Vernon. We shall be curious to learn the view taken in the paper and discussion on the last-named subject. As far as we have the means of forming an opinion, we should think the answer ought to be in the negative. The general programme of papers is a very large one, of very varied interest, and if a full attendance is secured the first meeting of the Australasian Association ought to be a great success.

New York
Institution of
Civil Engineers.

THE example set by the members of the Institution of Civil Engineers in erecting a home for themselves in Great George-street has been quickly followed by the American Society of Civil Engineers, who have recently opened in New York a very commodious building, which is to serve as their headquarters in future. The Society's new home, which has cost some 40,000*l.*, is situated in West Fifty-seventh-street, near the Carnegie Music Hall, and provides all the accommodation likely to be required by its members for many years to come. The reception-rooms, secretary's offices, and a large room intended for a convenient meeting place for members for social and business intercourse, occupy the first floor, while the reading-room, and the meeting-hall, which is capable of seating 400 persons, are on the second floor. A model-room and museums are provided on the third floor, and the whole of the fourth floor is devoted to the library, where there is sufficient space for over 100,000 volumes.

Paintings in
the Cour des
Comptes, Paris.

On the ruined walls of the Cour des Comptes, soon to be taken down, there are still to be seen a certain number of decorative paintings by Théodore Chasserian, representing respec-

tively [Peace, War, Order, Force, and "Le Commerce rapprochant les Nations." These paintings naturally suffered very much from the fire at the Quai d'Orsay, but some portions of them remain, which are admirable as far as they go, and could easily be detached from the wall and preserved. It is surprising that the Fine Arts Department in the French Government has made no effort to save these relics of an eminent artist before the destruction of the walls.

New Sculpture
at the
Doge's Palace.

It appears from a communication made to the *Times* of Tuesday, that there has been much rejoicing over the addition of a modern piece of relief sculpture to the Doge's Palace at Venice, to replace the ancient sculpture which was torn down at the time of the fall of the Venetian Republic. The Italian Government opened a competition two years ago for the best modern sculpture to replace the old, which was won by a Venetian sculptor, Urbano Bottasso, whose work, representing the Venetian lion and the kneeling figure of the Doge Gritti, has just been fixed in position over the balcony opening at which the Doges formerly used to present themselves to the people on special occasions. We fear, however, that we cannot join in the reflection of the newspaper correspondent that "this piece of sculpture gives yet an added interest to the unique building which records the history and forms one of the chief glories of the city of the sea." Some of our readers, at all events, will be able to form their own comment on that reflection, so characteristic of the English middle-class mind, and of its truly representative journal.

The Berlin
Municipal
Architect.

THE great monotony of municipal architecture at Berlin has long been the subject of complaint. Since the new City Architect of the German capital has taken office, however, the policy of its Board of Works has materially changed, and we hear of strenuous efforts being made to render the officially erected buildings an addition to the architectural aspect of Berlin. Herr Hoffmann, who so successfully served the German Government as architect to the Imperial Law Courts at Leipzig, has quietly set about reforming his department, and in future we are assured that Berlin is to have hospitals, schools, and public baths of architectural pretensions. Opportunity will not be wanting to the City Architect, for Berlin is shortly to have a considerable increase in its annual expenditure on public works; and, quite apart from the ordinary utilitarian buildings of the municipality, there are schemes on foot for a local museum and similar structures of importance. It will be interesting to see in what direction municipal architecture at Berlin will develop itself.

DR. W. W. E. FLETCHER'S report to the Local Government Board on an inspection of the Witney Urban District, more especially in relation to the disposal and removal of house refuse and night-soil, reveals a most discreditable state of things. It appears that the usual method of excrement disposal is by means of objectionable privies-with-cesspits, or pail-closets which were found to be almost equally objectionable. The risers of the privy-seats are fre-

quently constructed of wood, with the result that they become saturated with offensive matter. The cesspits are dug below the ground level, are pervious, and allow the escape of urine and other liquid matters into the subsoil. They are not so constructed as to admit of the application of ashes to the contained excrement, and they are emptied only at long intervals. Each cesspit-privy may justly be looked upon as an individual source of nuisance. The pail-closets in the district are almost as great a source of nuisance as are the privy-cesspits. At Buckle's Yard four closets intended for use as pail-closets had been erected in what appeared to be an old stable. The stench in the building was almost overpowering, and there was so little light inside the closets that it was necessary to strike matches to examine them. It was then observed that the closets were unprovided with pails, and that the spaces beneath the seats contained a considerable amount of excrement and urine. There is no public water supply in Witney, and, consequently, wherever water-closets are in use, water for flushing purposes has to be supplied by cisterns collecting rain-water, or filled by pumping, or reliance has to be placed on hand-flushing. Water-supply is derived almost entirely from surface wells, of which there are a very large number, almost every group of houses having one well, or more, in the back-yard or garden. Considering the proximity of privy cesspits, and the fact that excrement is utilised in the cultivation of the gardens, or is merely deposited in them in bulk as removed from privies, "it is impossible," as Dr. Fletcher observes, "to look on water obtained from wells so situated without suspicion;" which is a mild way of putting it. The permeability of the subsoil of the district was recently well illustrated by the result attending pumping operations in connexion with the sinking of a settling tank at the principal sewer outfall:—

"A powerful centrifugal pump had to be continuously in use while the men were at work, with the result that many of the wells ceased to yield water and became empty, although some were situated at considerable distances from the sewer outfall. If water can be thus drawn long distances through the Witney sub-soil as a consequence of pumping, it is only reasonable to believe that the surface wells must derive pollution, to a greater or less extent, from privy cesspits and excremental deposits within a few yards' distance."

Proposals for a public water-supply have been before the Board; but nothing definite has been done. It is surely high time.

The Italian
Hospital and
Queen-square.

THE old premises, Nos. 40-1, on the south side of Queen-square, are being demolished for a rebuilding of the Italian Hospital. It is sometimes said, upon Elmes's authority, that the house forming the present hospital was designed by Wren. In his works and life of Sir Christopher Wren, Elmes writes:—

The large mansion on the south side of Queen-square, Bloomsbury, now divided, is also by Wren, who built it for Lord (sic) Newcastle.

Failing any authentic corroboration of that statement, we may probably conclude that Elmes had in his mind Powis House, at the corner of Great Queen-street and Lincoln's Inn-fields, built circa 1686, for William, Marquis of Powis, and bought by the Duke of Newcastle (testis Hatton, "A New View

of London," 1708). But Powis, afterwards Newcastle, House was, Walpole tells us by William Winde, or Wynne, a pupil of Sir B. Gerbier. Amongst celebrated residents in Queen-square were Jonathan Richardson, the painter (ob. 1745), and his son (1770), Alderman John Barber the printer (1745), who set up Butler's monument in Westminster Abbey, Stukeley, the antiquarian and rector, and, in a house at the north-west corner, Dr. John Campbell, editor of "Biographia Britannica," whom Dr. Johnson after visited there. The north side of the square was left open, that the inhabitants might enjoy the prospect of the fields beyond, as we see it in Pollard's print, after E. Dayes, 1787. The Epileptic Hospital, opened in 1881 and enlarged ten years later (Mr. W. E. Russell, architect) occupies the site of a house where in the early years of this century Mrs. Stevens kept the most fashionable girls' school in London. The parish church of St. George-the-Martyr, Holborn, built as a chapel-of-ease to St. Andrew's in 1706, was repaired and altered by Mr. Teulon, in 1868-9.* By one account the house we cite was built as a nursery for Queen Anne's son, the Duke of Gloucester, whence the names of the square and the adjacent Gloucester-street.

AN interesting exhibition of Mr. Bridgman's paintings, water-colours, and pastels by Mr. Bridgman has been opened at the Cercle de l'Union Artistique, in the Rue Boissy d'Anglas, Paris. They are chiefly studies of Oriental subjects, many of them of remarkable power. Among them may be specially mentioned "Les Captifs d'un Pharaon," "Retour de Fête," "Sur les Terrasses," and "Fin de Journée." There are also some fine sea studies, and a large decorative panel entitled "Les Bacchantes." Two pastel studies of dancers, and a fine drawing representing Victor Hugo after death, are also worth special notice.

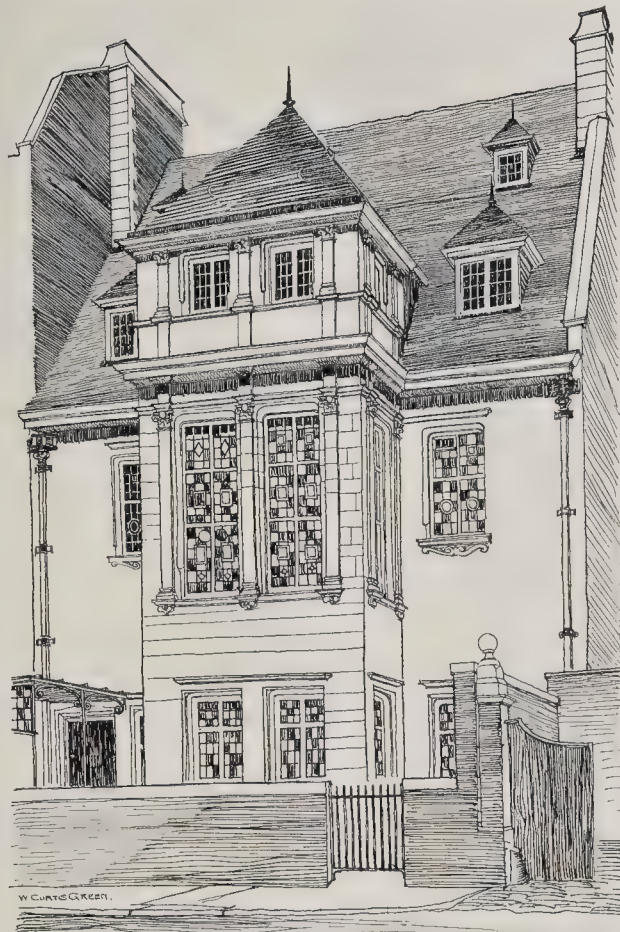
THE small group of painters who unite to form a special Gallery, landscape exhibition at the Dudley Gallery are Messrs. R. W. Allan, J. Aumonier, Jas. S. Hill, A. D. Peppercorn, Leslie Thomson, and E. A. Waterlow. We are unable to see that any special principle or method of landscape-painting is illustrated in the collection, unless it be to represent nature in her sadder and more pathetic aspects, and to avoid sunshine. Even Mr. Aumonier, usually a rather bright painter, seems to be infected by the general spirit of the exhibition, except in "A Lincolnshire Roadside," where he comes out into the sunlight. In spite of this monotony of melancholy, the exhibition is of a high class, as may be supposed from the names of the artists, and contains some very fine works of a rather sketchy type. Mr. Peppercorn's "Corn Ricks," Mr. Waterlow's "A Changing Sky," and Mr. Leslie Thomson's "Three Trees" by a river side, and the same painter's "A Dorset River," a large and fine study of a desolate-looking landscape, may be regarded as among the best works in the room, but all represent serious effort in landscape, though within an apparently purposely restricted range.

* See also Thackeray's "Adventures of Philip," Ch. xli.

BATTERSEA PUBLIC BATHS AND WASH-HOUSES COMPETITION.

A COURSE which is now, happily, most unusual as been followed by the Vestry of Battersea in respect to this competition. After having received designs from fifteen competitors for a group of buildings of considerable importance, the sum to be expended upon them amounting to £21,500, the Vestry has thought it sufficient to exhibit only the three sets of designs to which they have awarded premiums. Such a proceeding, which has about it an unpleasant air of secrecy, as though the authorities were fearful that their decision would not stand the fire of free criticism by the general and professional public, both of whom have at least a strong interest, if not a right, in the matter, is very greatly to be regretted. Two of the designs exhibited are certainly of considerable merit, and presumably warrant their selection for the first and second premiums, but the third one is not only so far inferior to the other two, but so poor in quality altogether, that it is difficult to imagine that some, at least, of the rejected designs are not equally, if not more, worthy of being shown to the public. The exhibition of their drawings is the only possible reward which the unsuccessful competitors can receive for all the work which they expend upon a competition, and, slight as it may be, it is, nevertheless, a sort of satisfaction which it seems positively discourteous on the part of the promoters of a competition to refuse to them. Nor can the plea of lack of space for the purpose be on this occasion suggested; in the actual room in the fine new Municipal buildings where the three selected designs are now being exhibited, there is ample space for showing ten times the number of drawings which are now there.

The site presents some difficulties, being an irregular quadrilateral, with frontages only on one side and one end; that to the principal street, Battersea Park-road, being the shorter one, and meeting the other front, to Cringle-street, at an obtuse angle. As the large swimming-bath has to be available as a hall for public entertainments in the winter, the regulations of the London County Council necessitate exits from both floor and gallery into both streets. All the premiated designs show due attention to this requirement, but in the matter of entrances and exits the arrangements shown in the design placed first are unquestionably superior. This design is by Mr. F. J. Smith, of 178, Great George-street, S.W., and, although the elevations are of no special merit, it is, taken as a whole, a fair specimen of this class of work, and in all the details of its planning thoroughly and sensibly worked out. In respect to one point it deviates from the letter of the instructions—the public reading-room, which has to be provided as an annexe to the baths, being placed on the ground instead of on the first floor. This appears, however, to be actually an improvement on the arrangement suggested, and the room itself is a comparatively unimportant part of the whole building. Still it is unfortunate that what is in all respects the most practical of the selected plans, should have this obvious technical defect, which would cause some qualms to a conscientious assessor. The elevations are of a commonplace character, with nothing particular to recommend them; they are, however, not much overwrought, and may be considered fairly appropriate. Mr. A. Hesse Tiltman (6, John-street, W.C.), who is placed second, sends a design with distinctly better elevations than the foregoing. His work has more interest and character about it, and harmonises well with the best class of recent work in the neighbourhood. His plans are good and workable, but when compared throughout with those of Mr. F. J. Smith, they show many points of inferiority, both in working to the intention of the "instructions" and "suggestions" and in matters of convenience. The third premiated design, by Mr. J. Hatchard Smith (41, Moorgate Station Buildings, E.C.), seems to owe its position entirely to a prettily-finished and cleverly-handled perspective view, evidently from a source very different from that which produced the other drawings. These by themselves are not "in the running" with the other designs, but the perspective-maker has worked wonders with most unpromising material. For instance, the group of buildings is dominated in the view by a square, massive-looking tower of brickwork and masonry, rising upwards of 50 ft. from the pavement, with a high tiled roof and lantern



*Sketches of London Street Architecture.—XXII. "The Yellow House," Bayswater-road.
Mr. Ernest George, Architect.*

above. From the plans, however, it is evident that this tower must be 17 ft. wide towards the front of the building, and only 12 ft. in the other direction, and, to make it square, the upper stages would have to be carried upon the roof of the swimming-bath. Moreover, the walls under it, even on the ground floor, are only 13½ in. thick, without piers or buttresses. It is certainly not to the credit of the architectural profession if all the remaining designs were actually inferior to No. 3, and such doubts can only be removed, and the issue of competitions rendered satisfactory to all concerned, by the frank exhibition of every finished design which is submitted.

SKETCHES OF LONDON STREET ARCHITECTURE.—XXII.

THIS sketch represents a stone house in the Bayswater-road, built from the designs of Mr. Ernest George.

FONT. EAST FREE CHURCH, BROUGHTY FERRY.—A baptismal font, together with a new communion table, has just been erected in East Free Church, Broughty Ferry. At the same time an extension of the choir platform has been carried out. The table and chair were executed by Messrs. Justice, Dundee, and the choir alterations by Messrs. Coullie, Broughty Ferry. The silver and copper work of the font are the work of Mr. J. M. Talbot, Edinburgh, while the whole of the alterations have been carried out from designs prepared by Mr. A. G. Heiton, architect, Perth, who has also supervised the work.

A NOTE AT THE NEW GALLERY.

THE interest of the exhibition at the New Gallery centres this year not on what are usually called "Old Masters," but on the works of several deceased painters of the recent period of English art. One room is devoted to examples of the schools of Italy and the Netherlands, but it contains only a few really fine works, the remainder being of interest rather as examples of certain schools of art, or of painters whose works are not very familiar. The real attraction in the New Gallery consists in the room devoted to the works of Rossetti, and perhaps still more in the miscellaneous collection in the north room, where we see once more Walker's grand picture "The Plough," and his almost equally remarkable "Wayfarers," and various works by Mason, Pinwell, Etty, Constable (nothing in quite his best way however), Linnell, and a group of pictures by Albert Moore, occupying one end of the room. Compared with this and the Rossetti room, it must be confessed that the "Old Master" room at this gallery is of very secondary interest, and appeals rather to the historic than the artistic sense.

The collection of Rossetti's works is of special interest, in that it represents almost every side of his genius as painter. "Proserpine," "Fiammetta," the "Blessed Damozel," and one or two others of the larger paintings, belong to the world of purely decorative painting, in which the ideal underlying the work really counts for very little; for in spite of

their various titles, the heads have all the same type of sensuous and expressionless beauty, of a totally ideal kind in this sense at least, that they resemble no living being; they are a type created by the painter; creatures with large lips and heavy masses of hair, mere machines devoid of human expression, created only to form the centre of a colour combination. The "Blessed Damozel" is the finest, the two heads of youthful cherubs in the foreground are especially fine. But it is *toujours perdrix*; the colours and draperies vary; the figure, under whatever alias, is the same. In spite of the ideal titles, this is after all a very sensuous school of art, and of far less intellectual interest than the best of Millais' portraits, for instance. But just as Millais shows us now and then that he could deal with ideal subjects, though for most part a realist, so there are things in this Rossetti collection which show that he could at times deal very powerfully with subjects of real human interest. Amongst the finest examples of this is the small picture of "The Virgin in the House of St. John," a remarkable little work, quite unlike Rossetti's usual manner, in which the Virgin is no mediæval vision, but simply a tall grave woman standing against the light of a window, through which a beautiful bit of evening sky is seen. It is still more surprising to find Rossetti treating such a subject as Johnson and Boswell having tea with two ladies at the Mitre; a group with a great deal of natural character, though the colour effect is rather artificial. Here there is also to be seen the remarkable and pathetic study for the head of the girl in "Found." In quite another way, too, Rossetti shows us real human life in his charming half-length of a girl under the title "Joli Cœur." To those who are already familiar with the larger works which represent Rossetti's central ideal in art, some of the smaller and less known works in this room will reveal a new side of his genius, and show that he was not quite so much wedded to one ideal as is sometimes supposed. Among the small pictures of a mediæval type there is a peculiar beauty, both in decorative effect and in feeling, in that which represents Lancelot and two other knights fed by the Sangreal; there is an almost reverential feeling about it which is very beautiful, though the knights, like those of Sir E. Burne-Jones, are too effeminate in expression and physique. "The Princess Sabra drawing the lot" is a remarkable piece of purely decorative composition in line and colour, which would make a fine design for stained glass.

We have already referred to the varied interest of the contents of the north room. Among the works by G. H. Mason is the large and fine picture of the "Evening Hymn" which first brought him into general notice, and several others, one of which, "The Blackberry Gatherers," children climbing a hill in a wooded landscape, is one of the most beautiful of all Mason's smaller works. The powerfully drawn picture of a man thrown from the Tarpeian rock represents one manner of Elty's of which there are few examples. Among the best things in the room is a small but most beautiful landscape by John Linnell, called simply "The Potato Field," an evening scene with an exceedingly fine sky; like some others of Linnell's small works, the picture has a grandeur of effect disproportioned to its size; it has the effect of a large picture reduced to a small scale. Among other works are a good Moirland; several small pictures by Pinwell; the group of Albert Moores before referred to, including one of the most artistically perfect of all his smaller works, "The Quartette"; and Rossetti's portrait of his mother, in which for once he aimed at simple realism, and produced an admirably characteristic and unaffected portrait.

BANK PREMISES, COCKERMOUTH.—The new premises of the Carlisle and Cumberland Bank at Cockermouth are situated in Main-street, Cockermouth. The building is of local stone, and the roof is covered with green Westmoreland slates. The ground-floor front is devoted to bank purposes, comprising the manager's office, telling-room, waiting and strong rooms, &c. Above and behind is a manager's residence. The contractors are:—Building, Mr. L. Ferguson, Workington; joinery and slating, Mr. Thomas Armstrong, Cockermouth; plastering, concreting, &c., Mr. John Bolton, Cockermouth; plumbing, painting, glazing, Mr. H. V. Fletcher and Mr. Palmer Robinson, Cockermouth. The architect is Mr. G. D. Oliver, of Carlisle, under whose superintendence the works are being carried out.

MAGAZINES AND REVIEWS.

In the *Art Journal* Mr. Fred Miller writes an article on wood carving, especially with a view to assisting amateurs, under the title "Cunning Work for Clever Fingers." Apparently this is to form one of a series. "The Decorations of London Clubs," by Mr. A. L. Baldry, is a new idea for an article, though we should hardly think that they would in general produce very much that is worth serious consideration from this point of view: the Athenæum, which is the subject of the first article, certainly does not. The most interesting article in the *Studio* is that on the works of the French wood engraver, Lepère, with a number of illustrations of his work. Mr. Bailie Scott contributes an article on "A Small Country House," with sketch plans and interiors and exteriors. Too much steep roof on it; this looks picturesque but is not practical. The dining and drawing-room are left with large openings from the hall, to be left open or temporarily covered as required. This has been done already in some American country houses, and is a good way of gaining a feeling of spaciousness in a really small house. The interiors of the rooms are pleasantly treated.

The *Artist*, among a good many interesting illustrations and odds and ends, devotes a special article to "The pre-Raphaelite Movement." Among the illustrations are some from little-known early book illustrations by Millais.

In *Scribner* some attention is given, under the heading "The Field of Art," to the work of the French sculptor Rodin, with an illustration of his remarkable work "Thought and Matter," a female head emerging from a roughly-squared block of marble.

The *Westminster Review* contains a trenchant article by Mr. S. Fothergill on "Trades Union Tactics," in which the plain truth is spoken, among other things, in regard to the perfectly illegal and sometimes even criminal nature of the means constantly taken by organised strikers to prevent the employment of new men; a phase of the matter which the law-makers of this land seem to be perversely blind to. The same magazine contains a short article, by Mr. R. M. Lockhart, on "Augustus Welby Pugin"; it contains nothing likely to be new to our readers, but may be useful in giving the general public some knowledge of the character and doings of a man whom they have nearly forgotten.

In the *Nineteenth Century*, Sir Algernon West's "Walk through Deserted London," though it does not deal with London architecturally, is interesting from the writer's recollections of incidents and histories connected with various London houses and other buildings.

The *Century* contains an illustrated article on that admirable French landscape painter, Jean-Charles Cazin.

In the *Revue Générale* M. Arnold Goffin gives an article on "Siena," a description of the old city and its buildings, with illustrations from photographs.

In the *Pall Mall Magazine* appears the first instalment of an essay by Sir Walter Besant on the history of South London, from the time when the site was a marsh; a history which in his hands cannot fail to be interesting.

Harper contains an article by Elise J. Allen on "Stuttgart," with sketches by Mr. Pennell, and another on a set of curious mediæval frescoes at Runkenstein Castle in "the Tirol" (as the Americans prefer to call that region), illustrating the history of Tristram and Iseult.

The *Antiquary* includes an illustrated article on Kirk Lonan, in the Isle of Man, with a plan and sketches of the church and illustrations of two of its crosses.

The *House Beautiful* (Chicago) is a pretty little magazine apparently intended chiefly for lady housekeepers, and treating of points in the arrangement or decoration of the interiors of houses—"Suggestions on Framing" (pictures), "Jewels and their Settings," "Concerning Bedrooms," &c. The subjects are well treated and in an interesting manner; in the matter of bedrooms, however, we cannot agree with the approval bestowed on the old-fashioned canopy or four-poster bed as a means of subduing the early sunshine in the morning; those curtained-up beds were not wholesome to sleep in, confining the air too much, and the desired result can surely be attained by sufficiently draping the window. Bedroom windows, moreover, are often too large, a mistake which is not referred to in the article.

PRIVATE BILLS, SESSION 1898; AND PROVISIONAL ORDERS (BOARD OF TRADE).

THE number (335) of private measures prepared for next Session, exceeds by 42 the total of last year, an increase mainly due in respect of electricity (86 provisional orders), and water and gas projects (54 bills). Of the railway bills (62), none is of unusual magnitude; whilst many will greatly facilitate communication between manufacturing towns and industrial districts in Yorkshire and the Midlands, and with places of resort in North, East, and South England. New town halls and municipal buildings are contemplated for Blackpool, Cardiff, Mallock, and Wigan; together with hospitals, museums, reading-rooms, recreation grounds, open spaces, and the like, in other places. The largest schemes relate to docks at Liverpool and Hull, and extensive maritime works are projected at Dover, Plymouth, Workington, and Weymouth; also a railway bridge across the Dee.

We give an abstract from the statutory "Notices" (with some incidental particulars) of the more important enterprises within our own province, which we have not already described.

MUNICIPAL, BUILDING, SANITARY, AND OTHER LOCAL IMPROVEMENTS.

Bills.—By the Corporations of *Blackburn*: To take over the Corporation Tramways Company, and lay down fresh lines on a 4-ft. gauge; to effect street improvements and widen the Lancashire and Yorkshire railway bridges over Alport, Stanley, and Galligraeve streets, prohibit the carriage of carcasses and other offensive matter through the streets within certain hours, and regulate building, advertisement hoardings, and the height of factory chimneys. *Blackpool*: To acquire lands for market purposes, and for a town hall and municipal offices at Talbot-square; and extend the township so as to include the entire borough. *Burnley*: To work the tramways with electrical or other motive power, and supply electrical fittings and appliances; improve the water supply; provide refrigerator or cold air stores, together with ice-making apparatus, for marketable articles; and to erect a crematorium on a site adjoining the cemetery. *Bury*: New waterworks; to erect infectious diseases hospitals; to convert all pail closets, privies, and the like into water or slop waste closets or other closet accommodation on the water-carriage system; and for better provision in respect of slaughter and common lodging-houses. *Cardiff*: To confirm an agreement made with the Marquis of Bute on April 14 for buying Cathays Park, and to convey as free gifts, sites therein for the National University of Wales, for uses of the County Council, and to the University College of South Wales and Monmouthshire, or to or for any educational or other public or local authority; to erect a town hall, law courts, and other municipal offices; and acquire lands for electrical stations, and an infectious diseases hospital. *Carmarthen*: To acquire sites in St. Peter's parish for a market, market-place, and fair-ground, and 104 acres for a public recreation-ground, and provide gymnastical and other apparatus therefor, with a band, shelters, and stands; also to extend the borough limits by taking in a part of Newchurch. *Halifax*: To lay out new streets and widen others; make and deal in electrical machinery and plant; provide bands of music, concerts, and other entertainments; to authorise the levying of a rate for purposes of the Public Libraries Acts, 1892-3, not exceeding 3½d. in the pound, or such other sum as the Act may prescribe; and provide for the supply, from the Corporation works, of gas gratuitously for illuminations or extraordinary public occasions. *Kidgley*: New waterworks, and to make a New Bully Trees reservoir by embanking Sladen Brook, and to take lands, including Stanbury Moor, 10.5 acres, for protecting from pollution certain impounded waters; to make improved regulations for water-closet accommodation (*vide Bury*); to regulate street traffic and prevent the throwing of bills and paper in streets. *Liverpool*: To widen Ulet-road, Morley-street, and Christian-street; acquire lands for an extension of the City Infectious Diseases Hospital; to vest in the Corporation for conversion into ornamental open spaces, or for

* Estimated cost, including site, £50,000; see the *Builder* of December 18 and 25 (with plans and drawings), for the competition and its result.

other public uses, the fee-simple of St. Mary's (Kirkdale), Lowhill (Everton), St. Anne's cemeteries, St. George's (Everton), St. Mary's (Edgehill), St. Michael's, St. James's (Toxteth), and St. Martin's-in-the-Fields churchyards, and the Jewish burial-grounds in Oakes and Upper Feeder-streets; and to convert into an open space the site of Pierhead Baths, or use it for new baths or other purposes. *Newcastle-upon-Tyne*: To appropriate a portion not exceeding 10 acres on the east side of "Castle Leazes"—whereof they are owners—as a site for a new infirmary or hospital, and to convey the site without payment to the trustees of the Royal Infirmary. *Oldham*: To construct viaducts from Union-street to Greengate-street, and Goddard-street to Alexandra-park, across the railways; for new street works, widenings, and improvements; to construct public lavatories, &c., and ordain that proper water-closet accommodation shall obtain; to extend and improve the covered and open market, and establish an electrical station for the tramway service. *Plymouth*: For tramways, 3 ft. 6 in. gauge; to establish a new cattle market, 3 acres in extent, and take part of the present one's site for a museum; provide and equip three recreation grounds; erect new slaughter-houses; and extend the borough area to include part of West Peverell and other districts. *St. Helen's*: For tramways, 4 ft. 8½ in. gauge, with electrical or any other mechanical power; to include part of Eccleston within the borough; to provide that no new street shall end in a *cul-de-sac*; to regulate street advertisements, and provide for water-closet accommodation (*vide Bury*). *West Ham*: To work the tramways by mechanical power, and construct stations; make a new road in Dagenham, and widen High-street, Plaistow; Whalebone-lane, Portway, Fox-street, and Ham Park-road; purchase parts of the Park from the Corporation of London; erect hospitals at Dagenham (small-pox) and Plaistow; enlarge the Town Hall and Union Workhouse, and establish the Forest House Auxiliary Workhouse; to buy Poplar and Plaistow Hospitals from the Poplar District Board of Works and the Guardians, respectively; provide recreation grounds; cleanse, dredge, and deepen the "Old River Lea" and its tributaries; and regulations for building public dancing, music, and entertainments. *Wigan*: To buy 21,500 sq. yds., or thereabouts, near New Market-street, for a town hall, and widen and improve certain streets.

By the Urban District Councils of *East Ham*: To buy the local tramways; appoint building inspectors; provide for a constant water supply; regulate the height of buildings and chimneys; and make restrictions as to sky-signs, fencing of waste land, and street wires. *Edmonton*: To buy Pymmes Park, and preserve it as a public place or recreation ground, the Corporation of London, the Middlesex, and London County Councils, Strand Union Board of Guardians, and Councils of any Urban District around, to contribute; to lay out and plant the ground, and equip the mansion-house as a library or museum; to appoint inspectors of buildings, sewers, and drains; and make better regulations in respect of sanitary matters, removal of refuse, sky-signs, wires, and travelling vans and shows. *Ilford*: To buy and work the tramways; to equip recreation grounds, and provide a band; appoint building inspectors, to make regulations as regards new streets, buildings, crossings, cellar-gratings, yards, sky-signs, sanitary matters, and for larger powers in respect of infectious diseases. *Leyton*: To provide and equip conservatories, museums, pavilions, assembly and reading-rooms; for organs in their Council or other public buildings; to appoint building inspectors; make regulations in respect of sky-signs, over-head wires, drainage, sanitary matters, caravans, shows, steam-organs, gipsies, and squatters, and for the removal and exclusion of beggars, rogues, gamblers, sharpers, vagabonds, and others. *Matlock*: For new sewage works and intercepting sewers; to fit up and equip Bridge House as a Town Hall; regulations for bands, concerts, &c., in their parks and public grounds; for the inspection and licensing of public vehicles; to advertise the local attractions; to ordain that street musicians shall depart when required to do so; and for by-laws as to steam-whistles, caravans, shows, and the like; and *Paignton*: To prohibit the keeping of pigs within 150 ft. of any dwelling or public highway; to restrict the fixing of wires, tubes, &c., under, along, or across public thoroughfares, and the use of cycles and locomotives particularly vehicles, together with the placing or

leaving of articles or goods on the streets and footways, or the exposing of goods outside shop doors and windows in such a way as to obstruct traffic.

HARBOURS, DOCKS, PIERS, BRIDGES, AND OTHER MARITIME WORKS.

Bills.—By the following Boards, Railway Companies, &c. *Mersey Docks and Harbour Board*: To enlarge Wapping dock; make two docks on the sites of the north and south portions of King's Dock, the tobacco warehouses, and the quay between; widen and deepen Queen's Dock, and deepen Coburg, Brunswick, and Union Docks; for new graving docks by Queen's dock, on the sites of part of Queen's graving dock, and the adjoining ship-building yards, and between Toxteth and Brunswick Docks; to widen Huskisson and Half-tide Docks; make new cuts between Queen's and Coburg Docks, and from the last-named into the last-named from the Mersey; and build a river-wall from Eagle Basin to North Pier-head. [This extensive scheme, including new tobacco warehouses, is calculated to cost three-and-a-half millions sterling, it provides for the reception of the largest vessels afloat, and gives about 250,000 yards additional shed floor.] *Dover Harbour Board*: To vary or extend in a south-east or south direction the pier authorised by their Act of 1891, from a point in the East Pier works 410 ft. from its landward end, continuing seawards about 1,510 ft., and ending at a point 1,920 ft. from the landward end of East Pier; and a spur breakwater about 150 ft. long, beginning at a point 880 ft. in an easterly direction from the seaward end of the fort at the end of Admiralty Pier, and ending at a point 150 ft. in a northerly direction from the point of commencement: they will abandon the proposed pier in continuation of Admiralty Pier, authorised by their Act of 1891. [The Board's works will lie west of the proposed Admiralty Harbour to be formed by extending Admiralty Pier east-south-eastwards 2,000 ft., making a pier southwards, 3,320 ft. from the headland point 200 yards east of the convict prison enclosure, with a south breakwater 4,200 ft. between, distant about 1,330 yards from the shore, and a sea wall, 3,850 ft., between Castle Jetty and the proposed easternmost pier.] *Ipswich Dock Commission*: To make opening or swing bridges across the new and old entrance locks, with a pier or jetty about 170 yds. long from near the summer house to the river Orwell, and certain quays and wharfs; also to extend their dock tramways, and alter them for use with steam power, on a 4 ft. 8½ in. gauge. *North-Eastern Railway*: Three river walls at Hull on the river's north shore—(1) about 1,880 yds., between the entrances into St. Andrew's and Albert Docks; (2) between Albert Dock entrance and Humber Dock basin; and (3) between a point 170 yds. south of South Bridge and Victoria Dock outer basin; a deep-water lock and entrance, about 600 ft., to Albert Dock; a dock, 440 yds. by 130 yds., with a lock 320 ft. long, on the sites of Humber and Albert Dock-basins and dock-locks, and Island-wharf; to lengthen Victoria Jetty; and construct in place of Victoria Pier, a pier with pontoon landing-stage 400 ft. long, extending 80 yds. south from opposite the end of Queen-street. *The Lancashire County Council* seek to appoint a county bridge-master to hold the offices now severally held by the surveyor of the county bridges and the bridge-masters of the county—"hundreds"—six in number. *Lincoln and East Coast Railway and Dock*: For two piers or breakwaters from the promenade, Sutton-on-Sea, about 1,300 yards eastwards, with another pier, about 1,050 yards north-eastwards—the latter in lieu of certain works authorised by the North Sea Fisheries. (E. Lines) Harbour and Dock Act, 1884; and to take over the South and East Coast, and Sutton and Willoughby Railway Companies. *Plymouth Corporation*: A quay wall between the graving-dock and the Cattewater, a wharf wall between the latter and Prince Rock, and a breakwater in the Sound from the west end of Mount Batten breakwater to a point (10 ch.) south of Madeira-parade; and *Great Western Railway*: a harbour at Weymouth, in Portland Roads, between the Nothe and the Admiralty breakwater now in course of erection near the Bincleave Rocks, with two piers from the sea

wall at Nothe Fort (26 ch.), and the Admiralty breakwater (17 ch.), and an embankment, with two jetties therefrom, for reclaiming portions of the foreshore between the Admiralty breakwater and the intended pier at Nothe Fort: a new road and three junction railways with the Wilts, Somerset, and Weymouth Railway are included in the scheme.

By other Companies: At Blackpool, a "Palatine Promenade Pier," 645 ft., from opposite Hound's-hill; and (by the Blackpool Sea Water Company) a pier, 1,000 yards westwards, from opposite Park Hotel, with an approach from Queen's-drive and a sea-water-pumping-station at the pier's west end. At Cardiff, for a sea-wall, dock, quay, lock, and jetties, and a sea-wall to reclaim portions of the "Penarth Flats." At Newhaven, a sea-wall and defences between Newhaven and Seaford, by the Newhaven Harbour, and London, Brighton, and South Coast Railway Companies, or either of them. At Seaham, a harbour, two piers, and a dock on site of the South Dock and Dry Harbour; and at Workington, a company to take over the existing works, with Lonsdale Dock, from Lord Lonsdale and his trustees; to deepen and improve the harbour; a wet dock, 233 yards by 200 yards; and a pier, 167 yards, from the end of John Pier, Seaton.

Provisional Orders.—U. D. C. Menai Bridge, a pier and other works at Menai Bridge, 320 ft. southwards from the end of St. George's-road. At Alnmouth, a dam, with middle lock and roadway, across the Aln, and a pier, 200 ft. seawards from the dam's east side; and at Kemp Town, Brighton, a jetty or landing-stage, with a pier-head, from the end of Paston-place groynes, extending 600 ft. from the sea wall.

RAILWAYS.

Great Central: A line (about 10 miles) from Ruislip to their line at Willesden, through Northolt, Harrow, Greenford, and Wembley, with minor works; to take sundry lands, and to stop up, in Marylebone, Venables, Little North, Capland, Luton, and Orcus-streets, Princess-mews, Carlisle-place, Weston-place, and parts of Salisbury and Richmond-streets. *Charing Cross, Euston, and Hampstead*: To abandon part of their authorised line (Act, 1893), and substitute a line from a point under Charing Cross-road, about 30 yards along that road south-eastwards from the principal entrance to the Garrick Theatre, and ending at a point under the shop No. 23, Craven-street, Strand. *Metropolitan*: To acquire lands for ventilating Praed-street, Baker-street, Portland-road, Gower-street, Marlborough-road, and Swiss-Cottage stations; and to work their traffic, and also on their joint lines (Inner Circle) with the Metropolitan District Railway, by electrical power, with a generating station at the corner of Marylebone-road and Chapel-street. *City and South London*: For sidings under Clapham High-street, and disposal of such part of their line as lies between King William-street and Borough High-street to the City and Brighton Railway or any Company authorised to make a railway from their line to Brixton-hill. *City and Brixton*: From the last-named Company's line in Borough High-street to Brixton-hill, with a foot subway beneath Kennington Park-road in connection with that company's Oval station.† *New Cross and Waterloo*: Underground lines (1) from Old Kent-road, at the London, Brighton, and South Coast Railway bridge, to Waterloo-road, and thence to join the Baker-street and Waterloo Railway at College-street, Lambeth, (4) a branch from (1) in Waterloo-road to the Baker-street and Waterloo line under Aubin-street, and (5) from that line under Parkes-crecent-gardens to Seymour-street, St. Pancras.† *Great Northern and City*: Extension of lines in Islington and Shoreditch, with a junction to Finsbury Park; generating stations in Eagle Wharf-road and Gillespie-road, Islington.† *Paddington and Charing Cross*: From the north side of the Avenue Theatre to James-street, Paddington, with foot-subways at the junction of Brompton-road and Knightsbridge High-road, and at Eastbourne-mews to the subway beneath the Great Western Railway terminus platforms; and to lower the level of the Baker-street and Waterloo line—above which it will pass—between Vigo and Cockspur-streets.† *London, Brighton, and South Coast*: Lines from

* Messrs. Coode, Son, & Matthews, chief engineers; Major Pilkington, R.E., engineer under the Naval Works Loan; Messrs. S. Pearson & Sons, contractors: low-water areas, 60 acres. The present East Pier works are being executed after Messrs. Coode, Son, & Matthews' designs on a commercial harbour with an area of 75 acres.

† In their report, published December 3, the Board of Trade Committee recommend the construction of several more openings, as a temporary expedient, whilst advocating the ultimate adoption of electrical power.

† Gauge, 4 ft. 8½ in.; electrical, or cable, or other motive power, except steam locomotives.

Lingfield station to the racecourse; their Dorking line, at Bradley-lane, Dorking, to Ockley, and thence to Cranleigh; and Holmwood to Ockley—passing (for about 12 miles) through Dorking, Capel, Ockley, Ewhurst, Hambledon, Wotton, Abinger, and Cranleigh to widen their lines between Victoria and Clapham Junction, Streatham Common and Croydon, Holmwood and Capel, Newhaven and Seaford. *South-Eastern*: from (1) their line at Friendly-street, Deptford, to their Lady Well loop near Ellerdale-street, Lewisham; (2A) near Burnt Ash-lane, Lee, to near St. Mildred's-road, Lewisham; (3) Hither Green station to Grove Park station; (4) the end of (3), through Bromley and Chislehurst, to Orpington station. *Great Western*: A line (about 8 miles) from Great Marlow station to join their Henley branch at Henley, through Bisham, Hurley, Wargrave, Berks., and Rotherfield, Ox.; to widen their Maidenhead and Wycombe and Great Marlow branch lines between Loudwater and Great Marlow stations; a line from Castle Cary station (Wilts, Somerset, and Weymouth) to Langport station (Dorset and Yeovil), through Ansford, Alford, Lovington, Wincanton, Shepton Mallet, Somerset, Huish Episcopi, and Curry Rivell, taking 7 acres of common lands known as North-street and Langport Little Moors, in Langport. *Windsor and Ascot*: A company for a line (about 7 miles) from the Great Western Windsor branch, at the south end of the bridge across the Thames to the Ascot and Aldershot branch, through Clewer, Winkfield, and Sunninghill. *Great Northern*: A loop line from Enfield to Stevenage, through Chessington, Bishop's Hatfield, Bayford, and Hertingfordbury (about 22 miles), with a branch to Knebworth, through Bengoe, Stapleford, Watton, and Datchworth (about 9 miles); lines at Finsbury Park; widenings at Langley, Hitchin, and Sandy; to widen both sides of main line from Offord Cluncy station to Xaxley (about 18 miles), and Essendine to Little Bytham (about 8 miles), also their Skegness branch between Skegness and Firsby, and their Edgware branch, from Ballard's-lane, Finchley, to Edgware; to acquire lands in London and the provinces, with 28 acres of common-land in Bengoe, Watton, Huntingdon, Offord Cluncy, and Balby (for a new road at Doncaster), and to enlarge their goods depot in Royal Mint-street, London. *London and South Western*: A line from Exmouth station through Littleham and East Budleigh to Budleigh Salterton terminus; to widen and improve main line, south side, between Wandsworth-road and Homer-street; acquire certain property, including All Saints' district church and schools, Lambeth; a bridge over the Colne at Wyrdisbury; and to agree with local authorities for housing the labouring class displaced by their works. *London and North Western*: A line over and through Spax Fells, from Low Brow Bridge, near Teyby, through Orton, Crosby Ravensworth, and Shap, taking 14 acres of Birkbeck Fells Common, co. Westmorland. (The scheme comprises two tunnels, 2492 yards and 103 yards long, with viaducts from 44 yards to 400 yards in length; the present line, close by, will be reserved for goods traffic.) *Midland*: In Yorks, West Riding (1) from Royston and Nottan Station, on their Derby to Leeds main line, to Thornhill (about 8 miles); (2) Thornhill to St. John's-road, Huddersfield (about 8 miles), and thence through Lindley and Elland to Halifax (about 8 miles); and (3) Thornhill, through the Spen Valley, to Bradford (about 12 miles). We read that the company have resolved to enlarge their Sheffield station, at a cost of nearly 250,000*l.*, instead of building a new central station, as was first proposed. *North Staffordshire and Mid-Derbyshire*: in county Derby, from (1) Ashbourne (London and North-Western) to Offcote; (2) Mappleton (London and North-Western) to end of (1); (3) a junction with (1) and (2) at their end, to Ashover; and (4), end of (3) to join the Great Central Railway at Heath station, Chesterfield. (This line, about 24 miles, passing through Matlock, will unite the Staffordshire pottery with the Derbyshire coal-field districts, and serve a large industrial population.) *Wolverhampton to Essington*: (1) From near Cannock-road Bridge (Great Western Railway) to the Holly Bank Colliery Company's Mineral Railway at Essington—6 miles; (2) from (1) at Heath Town to Cannock-road (London and North-Western Railway), through Wednesfield, Trysull, and Seisdon, in South Staffordshire.

* See our "Note" of November 27, p. 442, ante.

Andoversford and Stratford-on-Avon: From Andoversford (Gloucestershire), Midland and South-Western Junction Railway, through Whittington, Rockhampton, Sudeley Manor, Winchcombe, Laverton, Buckland, Broadway, Mickleton, Pebworth, Quinton, Weston-on-Avon, Milcote, and Shotton—about 32 miles (joining the Birmingham and Stratford new line, and thus placing Birmingham in more direct communication with the South of England). *Great Eastern*: To widen their Reedham and Lowestoft, Beccles and Lowestoft, and South-east lines; and rebuild Newmarket, Yarmouth (South Town) and Lowestoft stations. *Great Eastern, Midland, and Great Northern Joint Committee*: (1) To extend their Cromer Junction line from North Repps to Mundesley, and (2) a line from Runtun, on their Cromer and Sheringham branch to their Cromer and Mundesley authorised line. *Cranbrook and Paddock Wood*: (1) From Paddock Wood station, through Brenchley, Horsmonden, and Goudhurst, (about Cranbrook about nine miles), and (2) from Cranbrook station to Appledore on the South-Eastern Railway, through Benenden, Rolvenden, Tenterden, Stone, Kenardington, and Snargate, in South-East Kent (about fifteen miles). *Brighton Underground*: From Queen's-road, north end, to King's-road at Russell-street, with a branch from West-street (near South-street), to King's-road, opposite South-street, generating station in Frederick-place, gauge 4 ft. 8½ in., and to be worked by electrical or other mechanical power. A company for a line from the Teign Valley line at the bridge across the River Bovey, through Bovey Tracy, Heathfield, Isington, Bickington, and Torbryan, to Ashburton, and thence to Brent (Great Western Railway), through Holne, Buckfastleigh, Dean Prior, and South Brent (about eighteen miles). A company for a line from the Great Western Railway bridge across the Dart, at Totnes, through Little Hempton, and Berry Pomeroy, to Paignton on the Great Western Railway (about six miles). *Blackpool and Garstang*: From Park-avenue, Blackpool, to Calder Bridge (London and North Western) through Hardhorn, Great Singleton, Elswick, Great Eccleston, Rawcliffe, and Catterall (about fifteen miles). *Brecon and Merthyr-Tydfil*: (1) a "Cardiff Branch" from Bedwas, on the Brecon to Newport main line, to join the Rhymer Railway at Caerphilly tunnel; (2) a "Caerphilly Curve" from Aber Broek Bridge on (1) to Van Bridge on their Caerphilly branch, through Bedwas, Monmouthshire, and Eglwysilan, Van, and Rudey, Glamorganshire. *Cardiff*: Twenty-five lines at and near Cardiff, and in the Taft and Aberdare Valleys, with branches and connexions, taking seven acres of Craig-Evan-Luysdon Common in Pontypridd and Merthyr-Tydfil. *East and West Wales*: (1) From Traawcoed (Manchester and Milford Railway) to Rhayader on the Mid-Wales Railway; (2) from (1) to Llanbadarn Fawr; (3) from (2) to New Radnor; and (4) from (2) to Ithon Bridge at Llanbadarn Fawr (London and North Western), taking for (3) two-and-a-half acres of Llandeigly Rhos common land, *Wrral*: An extension to Rhyl from a point between their Hoylake and West Kirby stations, across the golf links to Dee shore, then by a bridge three-and-half miles long across the Dee to Mostyn and Rhyl, taking thirteen-and-a-half acres of Sand Links, West Kirby (this route reduces by one-half the present journey, fifty miles, from Liverpool to Rhyl). *North British*: Lines in the counties of Fife, Edinburgh, Dumbarton, and Renfrew; from Dumfermline to Kincardine, and Edinburgh (Damhead) to Corstorphine; and an hotel at Queen-street station, Glasgow; to take over the Whiteinch tramway; and for further time to complete Waverley station (Acts of 1801 and 1893). *Caledonian*: To work their Glasgow Central, Tollcross, and other local lines by electrical power; and to build, for the first-named, a new station by Kelvin-grove-street. *Fishguard and Rosslare*: From Cork to City Park, Fermoy, and Waterford to Rosslare.

Light Railways.—From Knott End to Pilling, Lancashire; Bideford to Clowley; and Jordanston to Waun Fawr. St. David's, with a branch to St. David's Head, taking fourteen acres of common lands in Llanrian and St. David's.

TRAMWAYS.

Bills.—By the Corporations of Blackpool,* Cardiff,* Halifax,* Portsmouth* (taking over

* 4 ft. 6½ in. gauge.
† 3 ft. 6 in. gauge, with, in some cases, exemption from Sec. 34 of the Act of 1870, which limits the width of carriage and engine to 6 ft. 3 in.

the existing lines), and Wigan. *London United Tramways*: To extend their lines from Uxbridge-road to (a) Shepherd's Bush and Hammersmith Broadway, (b) King-street, West, and (c) along Askew-road; Kew Bridge-road to (a) Kew Green and Station Hotel, Kew-road; (b) Brentford High-street and west end of Hounslow High-street; Hanwell High-street to (a) Half Acre, Brentford, and (b) to Baling Broadway and Mall, and their Acton depot; and from King-street West to Goldhawk-road.* *Blackpool and Fleetwood.* Bristol Trys, and Carriage.* Manchester Carriage and Trys, and Norwich*. In Devonport, Plymouth, and Stoke† in Folkestone, Sandgate, and Hythe.* Hastings and St. Leonards† also for a tramway and tramroad from Victoria-House, Old-road, Llandudno, to near the summit of the Great Orme's Head. [See also "Municipal."]

Provisional Orders.—By the Corporations of Liverpool* and Huddersfield; the Urban District Councils of Eccleshill, East Ham,* Great Crosby,* Lintwaite,* Llandudno, and Waterloo-with-Seaforth,* and Blackpool, St. Anne's, and Lytham.* In Lytham: *Carlisle* (twenty-eight in number)† *General*: in West Hartlepool† *Highgate and Finchley*: along Archway and Great North-roads; *City of Oxford and District*: in St. Giles', Banbury-road, and South-parade, 4-ft. gauge; *Staffordshire*: in Stoke-on-Trent, Newcastle-under-Lyme, Hanley, Burslem, Fenton, and elsewhere, 4-ft. gauge; and *Woolwich and S.E. London*: in Plumstead and Woolwich.† In nearly all of these electrical or other mechanical power (steam, compressed air, or gas, oil-motors, &c.) will be used in lieu of, or addition to, animal power; and at Lintwaite and Great Orme's Head cable or locomotive steam-power may be employed.

ELECTRIC LIGHT, ENERGY, AND POWER SUPPLY

Provisional Orders.—Under the Electric Lighting Acts, 1882 and 1888: by the Corporations of Batley, Bolton (to serve the Rural District), Bridgwater, Burslem, Chichester, Chorley, Colne, Crewe, Darlington, Doncaster, Gravesend, Hastings (with purchase of the local company), Hereford, Lewes, Lowestoft, Maidenhead, Middlesbrough, Ossett, Rochdale, Rotherham, Royal Leamington Spa,* St. Albans, Shrewsbury (with purchase of the local company), Stoke-upon-Trent, Warrington, Weymouth, and Melcombe Regis,* and West Bromwich;† *Bermondsey*; and *Marylebone*† *Vestries*: the Lewisham District Board of Works†; the Urban District Councils of Aldershot, Aston Manor, Barnes, Birkdale, Dartford, East Ham, Hornsey, Hove, Huyton-with-Roby, Ilford, Ilfracombe, Leatherhead, Leigh-on-Sea, Margam, Oldbury,* Rawmarsh, St. Anne's-on-Sea, Smethwick,* East Stonehouse, Stourbridge, and Willesden; and the Rural District Councils of King's Norton, Kingswood, Isle of Thanet (for Sea and Sand), and Whitston, Lancashire. By companies—*British Lighthouse Wire*: in Huyton-with-Roby; *Buxton District Electric Lighting and Power*: for Buxton; *Charing Cross and Strand*: in St. Giles, St. George, Bloomsbury, and parts of St. Andrew and St. George-the-Martyr, Holborn, parishes; *Chislehurst*: in parts of the parish; *Chislehurst*: in Writtle, Great Baddow, Bromfield, Widford, and around; *County of London and Brush Provincial*: in Gower-street, Woburn-place, and North Bloomsbury, in Holborn, and Lincoln's, Gray's, Staple, and Furnival's Inns, in Marylebone, Bethnal Green, Poplar, Whitechapel, Bermondsey, Rotherhithe, Greenwich, and monsey, Lewisham; *Electric Supply Corporation of London*: in Ramsgate; *Great Western*: in Lewisham; *Marylebone*: in Marylebone; *Milton Moabray*: in the Urban and Rural Districts; *Midland Electric Lighting and Power* (of Birmingham); in Royal Leamington Spa; *Midland Corporation for Power Distribution*: in the boroughs of Dudley, Walsall, Wednesbury, West Bromwich, and Wolverhampton, and in Tipton, Willenhall, Wednesfield, Oldbury, Smethwick, Rowley Regis, and other places in South Staffs.; *National*: in Presa, *Norwich*: extension of area; *Nuneaton*: in Nuneaton and Chivers Coton; *Penarth*: in Penarth, Cogan, and Llandough; *Peterborough*; *Ryde*; *Southend*

* 4 ft. 6½ in. gauge.

† 3 ft. 6 in. gauge, with, in some cases, exemption from Sec. 34 of the Act of 1870, which limits the width of carriage and engine to 6 ft. 3 in.

For competitive projects see "Companies" and "Bills."

Gas; Tottenham and Edmonton Gas; Weston-super-Mare Syndicate: in the entire Sanitary District of Weston; and *Weymouth:* in Weymouth and Melcombe Regis.

Bills.—By the *Central Electric Supply:* To supply general purchasers, and establish a generating station on the sites of Nos. 12, Grove-road, and 23-8, North-bank, St. John's-wood; *General Power Distribution:* To supply an area in the counties of Derby, Nottingham, Lincoln, and York, within a twenty-six-mile radius from the north-west corner of Warsop parish, Notts, with a station at Sookholme, in that parish; and *Metropolitan Electric Supply:* For a station in Acton-lane, near the Grand Junction Canal; and to lay down cables and wires therefrom along Acton-lane, through Harlesden, and along Harrow-road, and also along the canal towing-path, to their station in Amberley-road, Paddington: they compete, by application for a Provisional Order, to supply Marylebone.

WATER SUPPLY.

Bills.—For new works, reservoirs, &c., by the Corporations of Bacup, Carlisle, Carmarthen, Halifax, Heywood, Ilkeston, Rochdale,* Todmorden, Tynemouth, and Yeovil. By the Urban District Councils of Filey, Matlock, and Northam. By the following companies, for additional works and extension of area of supply: Brompton, Chatham and Gillingham, and Rochester, Cranbrook District, Felstowe and Walton, Folkestone, Hartlepool, Newcastle and Gateshead, Newhaven and Seaford, City of Norwich, Southend, Southwark and Vauxhall, with two reservoirs at Walton-on-Thames (water area about 247,100 yds.) and App's Court, West Molesey (316,530 yds.), Staines Reservoirs Joint Committee, and Wey Valley. By new companies: To supply Crawley, Ifield, Three Bridges, Worth, and Slaughton; Foleshill, Stoke, Binley, Corley, and other parishes in North Warwickshire, and Wymondham and around.

Provisional Orders.—New works for Broughton-in-Furness, Igham, Wrotham, and Plaxton, South Hayling, and to include the whole of Hayling Island, and St. Neot's.

GAS SUPPLY.

Bills.—Additional works by the Corporations of Coventry (on 38 acres by the Coventry Canal, at New Inn Bridge), Halifax, Middlesbrough, and Morley; the Urban District Councils of Bakersfield, Filey,† and Market Harborough; the local companies at Aberystwith, Cromer,† Enfield,† Folkestone, Gloucester,† Morley,† Plymouth, and Stonehouse,† Redhill, Southampton,† Southend, Thanet, and Yeovil;†; a new company for Scunthorpe, Brumby, and Frodingham, Lincolnshire.

Provisional Orders.—Additional works by local companies: Budleigh Salterton,† Canock, Hednesford and district,† Colwall (Hereford),† King's Lynn, Great Marlow,† Whitchurch (Salop), and Slough. To the Local Government Board.—By Wenlock Corporation to take over the local works; the Urban District Councils of Selby and Haworth;†; and by the "undertakers" to supply Freshwater and Totland, Isle of Wight.

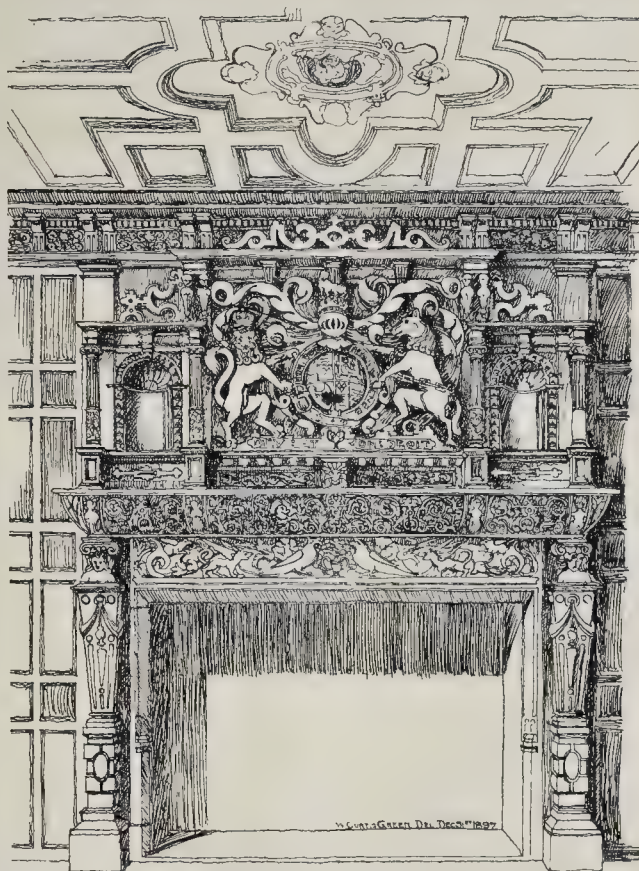
GAS AND WATER.

Bills.—*Clacton-on-Sea*†; new companies to supply Haslemere, Hambledon, Witley, Peper Harrow, Frensham, and Compton (South Surrey), Litchmere, Farnham, and Lurgashall (North Sussex), and Bramshot, Liphook, Grey-shott, and Headley (Hants), and around, with reservoir at Frensham; and Rhymney and Aber Valleys.

COMPETITIONS.

NEW CEMETERY, NOTTINGHAM.—The assessors appointed in these competitions have awarded the premiums as follows:—(A) Landscape Gardening, &c.: 1st premium, Mr. Thomas W. Mawson, The Corbels, Windermere; 2nd premium, Messrs. William Barron & Son, Elvaston Nurseries, Borrowash, Derby. (B) Chapels, Lodges, &c.: 1st premium, Messrs. Arthur E. McKewan, A.R.I.B.A., and Mr. Alfred J. Dunn, A.R.I.B.A., Colmore Chambers, 1, Newall-street, Birmingham; 2nd premium, Messrs. Chas. A. Nicholson, M.A., and Hubert C. Cerlette, A.R.I.B.A., 28, Theobald's-road, Gray's Inn, London.

* Taking 32 acres of common lands, and to buy the Todmorden Waterworks.
† With extension of area of supply.



Chimney-piece from Old Bromley Palace, now in the South Kensington Museum.

FIRE-PLACE, OLD BROMLEY PALACE.

THE subjoined sketch is from the fire-place and mantel recently placed in South Kensington Museum, and referred to in a "Note" in our last issue, as having originally belonged to an old house called "Bromley Palace" at Bromley-by-Bow, and which was demolished in 1894.

THE SANITARY INSPECTORS' ASSOCIATION.

At the meeting of this Association, held on the 1st inst., at Carpenters' Hall, London Wall, the President of the Association, Sir John Hutton, delivered his New Year's address. It had long been the desire, he said, and it was the wish of many who were interested in the welfare of the Association, to form a fund for the purpose of encouraging among the members study and research in the interest of public health; and he referred to a liberal and practical proposal which had been made by one of their members (Mr. Moss Flower) to found such a fund as a memorial of their two illustrious deceased Presidents, Sir Edwin Chadwick and Sir B. W. Richardson. The suggestion was accompanied by an offer of fifty guineas, provided that within nine months the fund should be raised to 500 guineas. The scheme might include special competitions, and perhaps prizes for the best papers read at meetings held in London or at meetings held by branch associations. The address referred to the recent visit of more than 100 members of the Association to Belgium to an International Congress, which had been full of interest. The success of the sanitary inspector's work might be appreciated by contrasting the vital statistics of the present day with the records of former periods. In 1660, the rate of mortality in London was annually 80 per 1,000, while the

rate for 1896 was 18.9 for the whole county of London. The significance of the contrast would be realised when the enormous increase in the number of inhabited houses in London and in the density of its population were considered. At the beginning of this century there were in London 147,042 houses, and a population of 958,788 persons, while in 1896 the houses numbered 596,030, and the population 4,443,018. Favourable as this contrast was, the time had not yet come for any relaxation of sanitarian efforts, for every one familiar with the poorer districts of London must feel convinced that the present death-rate could be still further reduced. In the case of many of the Local Authorities of London there was a laudable rivalry to keep up the number and quality of their staffs of sanitary inspectors, but, in the case of too many, a policy of false economy prevented the engagement of a sufficient staff, and even the adequate payment of those they had engaged. The President next referred to the efforts of the Association to obtain the appointment of an efficient examining board for sanitary inspectors, which they desired to see constituted on lines similar to the following:—Three members to be nominated by the Local Government Board, two by the Sanitary Institute, and one each by the following bodies: the Society of Medical Officers of Health, the British Institute of Public Health, the Royal Institute of British Architects, the Plumbers' and Carpenters' Companies, the Association of Municipal and County Engineers, and the National Health Society. The Association had prospered, among its 670 members being included men of distinction in various walks of life, members of the Institute of Civil Engineers, of the Royal Institute of British Architects, of the Sanitary Institute, the Surveyors' Institution, and the Association of Municipal and County En-

gineers. It was not merely a London, but a national, association. Referring finally to the question of London's water supply, the President said he hoped the question of the purity of the water supply to London would secure the early attention of thoughtful people. Special Committees and Royal Commissions seemed only to have resulted in dangerous delays and complications. A tidal river could not be an ideal source for so large a section of this vast community.

In responding to a vote of thanks, proposed by the Chairman of the Council, Mr. G. T. Dee, the President announced his intention to contribute fifty guineas to the proposed fund started by Mr. Moss Flower.

Illustrations.

SECOND PREMIAED DESIGN FOR CARDIFF TOWN HALL COMPETITION.

WE publish this week illustrations of the design, by Messrs. Gibson and Russell, which received the second premium in this important competition. The architects send us the following notes on their design:

"These buildings were designed with their principal facades to the South, as desired by the instructions, and were placed on the site so that they could be seen to the best advantage when approached from the town.

Each block was treated independently of the other, as it appeared to us more desirable to pronounce the distinctive purpose of each building than to make a repeat, the charm of which would exist on paper only owing to the great distance between the buildings, and their effectual division by the avenue—a division which will become more complete every year.

The accommodation in the Town Hall was arranged so that the offices frequented by the general public should be on the ground floor, placing the others on the upper floors in positions convenient for the work of the various departments. This method, in our judgment and experience, is preferable to designing each department in a system of flats which causes much unnecessary traffic through a building and does not conduce to the public comfort or convenience.

The council chamber, assembly, and ante-assembly room, are arranged en suite, and the Mayor's, Committee, and Town Clerk's private rooms are grouped closely together on a corridor private to themselves.

The law-courts are planned with the police-courts to the north as laid down in the conditions. As remarked by you in your criticism, they resemble those at Birmingham in their general disposition.

These are an admirable model, and the ground at disposal in the present instance lent itself readily to a similar disposition of the courts.

The exteriors of the buildings are treated in a free Classic style."

The third premiated design will be illustrated in our next issue.

DESIGN FOR A NOBLEMAN'S COUNTRY HOUSE.

This design, by Mr. A. H. Christie, obtained the gold medal and Travelling Studentship for 1897 at the Royal Academy.

In reply to a request that he would state his intention and aim in the design, Mr. Christie writes:—

"In making my design for the 'Nobleman's Country House,' I endeavoured to follow as closely as possible the conditions set by the Council of the Royal Academy.

These gave only a list, and a few dimensions, of the principal rooms, and the express statement that no state-rooms were required, seemed to point to a type of plan which would be more generally described as a 'gentleman's' country house.

The elevation was designed to express, as well as I could, the symmetrical interior, without having recourse to any particular 'style' of ornament."

We agree with Mr. Christie in thinking that a country house from which state-rooms are excluded does not properly come under the definition of a "nobleman's country house," and that the Academy made rather a mistake in their programme. If they had said "a nobleman's hunting-lodge" or "a nobleman's

shooting-box" it would have been well enough; but "a nobleman's country house" almost implies the existence of reception-rooms and the provision for large entertainments.

The plans have no scale on them, nor even any written statement of the scale, so that we are unable to furnish any scale to them on the reduced size; we presume the scale was merely stated in the instructions to students. We have again and again pointed out that this habit of dispensing with drawn-out scales on the drawings, which is also followed at the Ecole des Beaux-Arts, is exceedingly objectionable and inconvenient; and the students ought to be required to put a scale to geometrical drawings. It appears also that, in giving the students a dwelling-house as a subject, the Academy did not even impress on them the necessity of showing a compass on the plan, and of studying the position of the rooms in regard to aspect, as the author of the present design says that he has carefully followed the instructions. If that is the case we can only say that the architectural students at the Academy have in this instance been most inadequately instructed (in every sense of the word); the necessity of considering aspect in the plan of a house ought to have been one of the principal points impressed on them.

If we assume that the kitchen in this plan looks north (as a kitchen always ought if possible), and the sitting-rooms south, we find that in that case the breakfast-room looks south—a bad aspect for a breakfast-room, which wants the morning sun, especially in winter. The dining-room in the plan would look south and east; but if a dining-room is used, as it generally is, for luncheon in the middle of the day, south is a bad aspect for it, as in summer it is unpleasantly hot and sunny. South and west for the drawing-room will be quite right: but as a general rule it is a mistake to have the principal aspect for drawing-room and dining-room the same, however it may be convenient for symmetry; the same aspect is not suitable for both. Nor is south at all a good aspect for a library.

The serving-room between dining-room and breakfast-room, and opening into both, is a good point, and generally speaking the plan is well arranged; but the water-closet in the right wing is not sufficiently isolated, nor is such an apartment well placed next to a store-room, with the windows of the two close together.

As to the author's endeavour to avoid the details of any 'style,' that is an interesting and praiseworthy experiment which is a good deal in vogue among the younger school of architects at present, and we sympathise with the feeling which prompts it. At the same time it seems to us that Mr. Christie's well-meant attempt only illustrates the fact that it is not in man to produce entirely original architecture which shall at the same time be interesting; and in trying to avoid any known or accepted form of detail the designer has produced what to our mind suggests a large and superior farmhouse rather than "a nobleman's country house"; the architecture wants the air of "distinction" which should characterise a dwelling-house of the highest class. But no doubt our feeling may be declared to be out of date in these democratic days.

Books.

Das Grab des Mentuhotep. G. STEINDORFF (Königl. Museen zu Berlin, Mittheilungen aus den Orientalischen Sammlungen. Heft viii).

THE Oriental Museum of Berlin occasionally issues monographs on some of its important treasures, whether single objects or groups of objects closely connected. In the present case, Professor Steindorff—formerly of the Berlin Museum, now of Leipzig—has given us a sumptuous publication of a famous find made in Egypt by that old treasure-seeker and enthusiast, Passalacqua. It was by the purchase of Passalacqua's collection that the Egyptian department of the Berlin Museum was founded, and undoubtedly the greatest of his finds was that of an unframed tomb of the Early Middle Kingdom (about 2500 B.C.), belonging to a fairly high-placed official at the capital. The age was not one of much luxury, nor was Mentuhotep of the highest

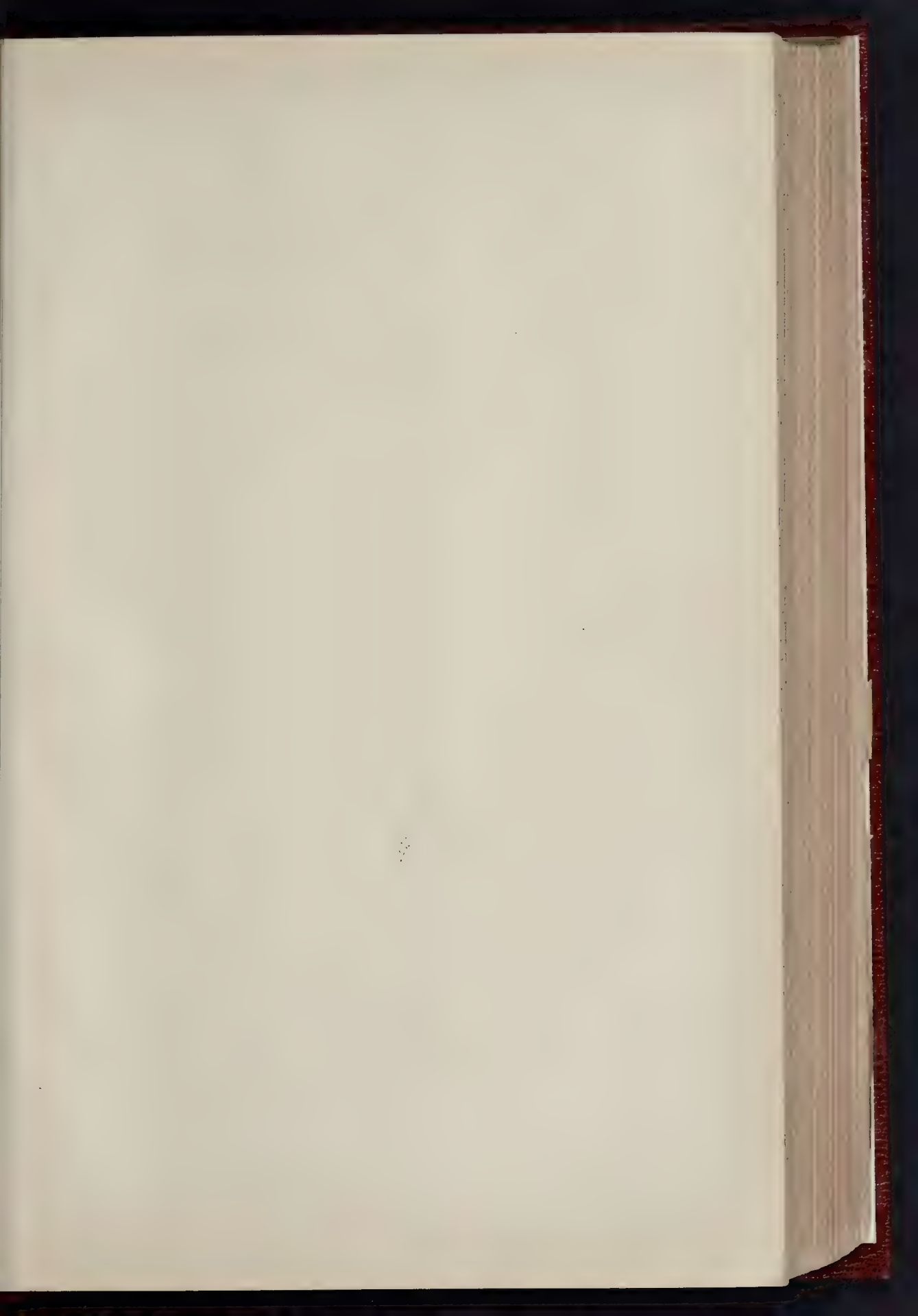
rank; hence jewellery was absent and the burial had offered no great attraction to tomb robbers. Nevertheless, the objects found were of great interest, and we are indebted to Passalacqua—who was, after all, ahead of his time in exploration—for preserving a very complete account of the find, and making drawings of all the objects, some few of which have since disappeared.

The tomb of Mentuhotep was found in the year 1823, in the valley of El Assasif, on the western side of Thebes. It was of a simple description; two narrow chambers had been cut in the rock from the sides of a short perpendicular shaft. The first, half way down the shaft, had been blocked by a wall of crude bricks, but was opened in ancient times by robbers and the contents burned. Passalacqua, however, went down a few feet lower, to the bottom of the shaft, and found the entrance of the second chamber with its brick sealing still intact. The greater part of the narrow chamber was occupied by a large wooden coffin, finely painted with designs and inscriptions. With it, on the right, were two model boats, and between them stood the painted wooden figure of a woman finely decked out in coloured garments and ornaments, bearing a basket on her head. On the left were the remains of food and drink offerings, bones of the head and shoulder of a calf, two pans of bread stuff covered with sycamore leaves, and four jars for liquids; with these was another female figure, basket on head. Behind the coffin was a head-rest.

The model dahabiyeh is delightful. The cabin with the master's shield hung outside and the master himself seated within, the sixteen rowers, the steersman with his curious apparatus—the blade of his steering-rod beautifully decorated—the pilot on the look-out for sandbanks, all are shown. On deck a woman grinds corn and a man kneads dough, while even the landing plank, the mooring-post and mallet are all there ready for use. On the other boat is a model of the funeral bier on which the mummy of Mentuhotep was conveyed. The construction of these boats is minutely described in the letterpress with the aid of diagrams.

The outer coffin enclosed a second which enclosed a third, each coffin being beautifully decorated. Within the third coffin lay the mummy, held in place by linen packing, a necklace of glazed beads on its breast; by its side was a fine wooden statuette of the deceased. The exterior decoration of the coffins presents many architectural features; in fact, each coffin seems to represent the hall or dwelling for the dead. In corresponding positions on the inside and outside of each coffin is painted a double door, and above it the semblance of a pair of eyes. In early times the body was buried crouched on its left side, and even after extended burial prevailed, still the door by which the deceased was supposed to pass out of his dwelling, and return to it at pleasure, was painted opposite the head on the left side of the coffin, and thus through the eyes above he could also conveniently gaze forth. The simulated pillars and pilasters painted with varied ornament, the lofty openings filled with screens of elaborately coloured matting, held in place by cords lacing them to the framework, are of great interest in studying the light architecture of ancient Egyptian halls, in which cool airiness was above all desired. The interior decoration of the coffins represents the furniture and supplies for the deceased within his dwelling—all the personal equipment considered suitable to the rank of the deceased for life here and hereafter: food, clothes, weapons, tools, insignia of office, articles of the toilet, &c., many of the objects being highly charged with symbolical meaning. Similar representations are found on other coffins of the same period, at Cairo, in the British Museum, and elsewhere, to all of which Professor Steindorff makes reference in the text. In *Heft ix.* of these *Mittheilungen* he will publish facsimiles from the paintings of another elaborate coffin in the Berlin Museum, and promises to discuss the architectural details more fully in that connexion.

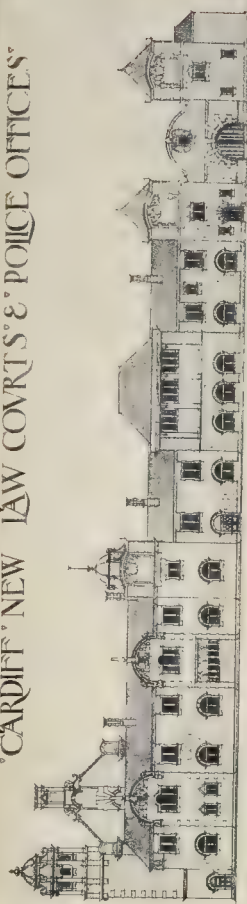
To the archaeologist, the fine coloured plates in the present volume are full of enlightenment, more especially since the fidelity of the reproductions leaves nothing to be desired. Professor Steindorff's description gives in concise terms all the information necessary to our study of the illustrations; and, while refraining from theories, he offers many penetrating observations as to the meaning and use of the objects figured.



CARDIFF NEW LAW COURTS & POLICE OFFICES



NORTH ELEVATION



EAST ELEVATION



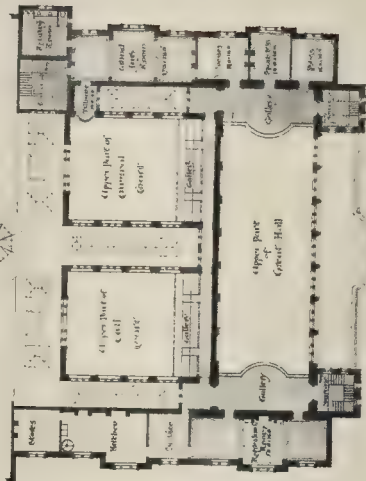
SECTION AA



SECTION BB



SECTION CC

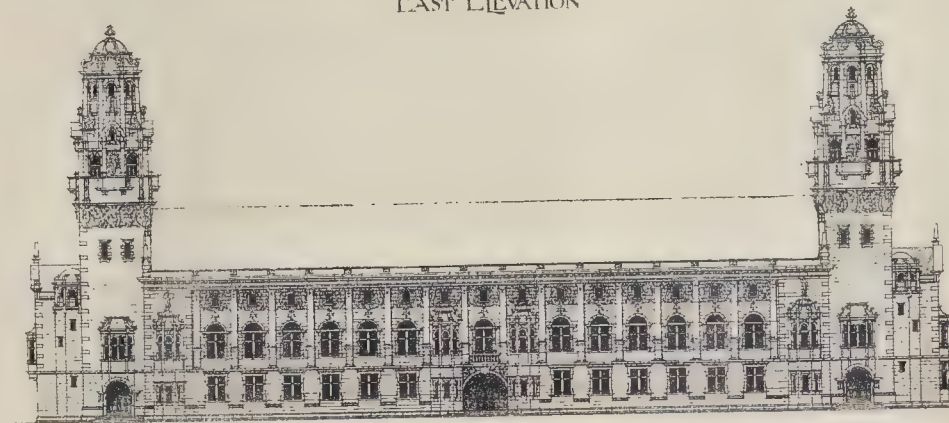


FIRST FLOOR PLAN

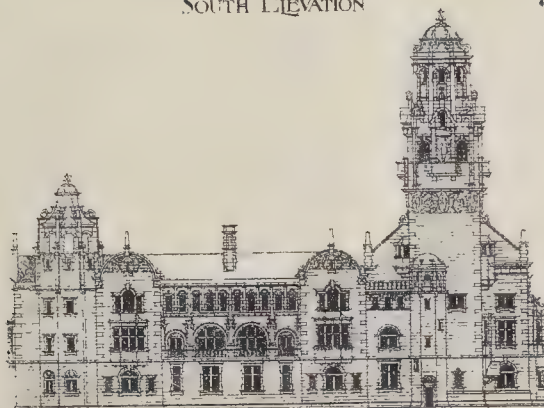
ELEVATIONS OF TOWN HALL BLOCK



EAST ELEVATION



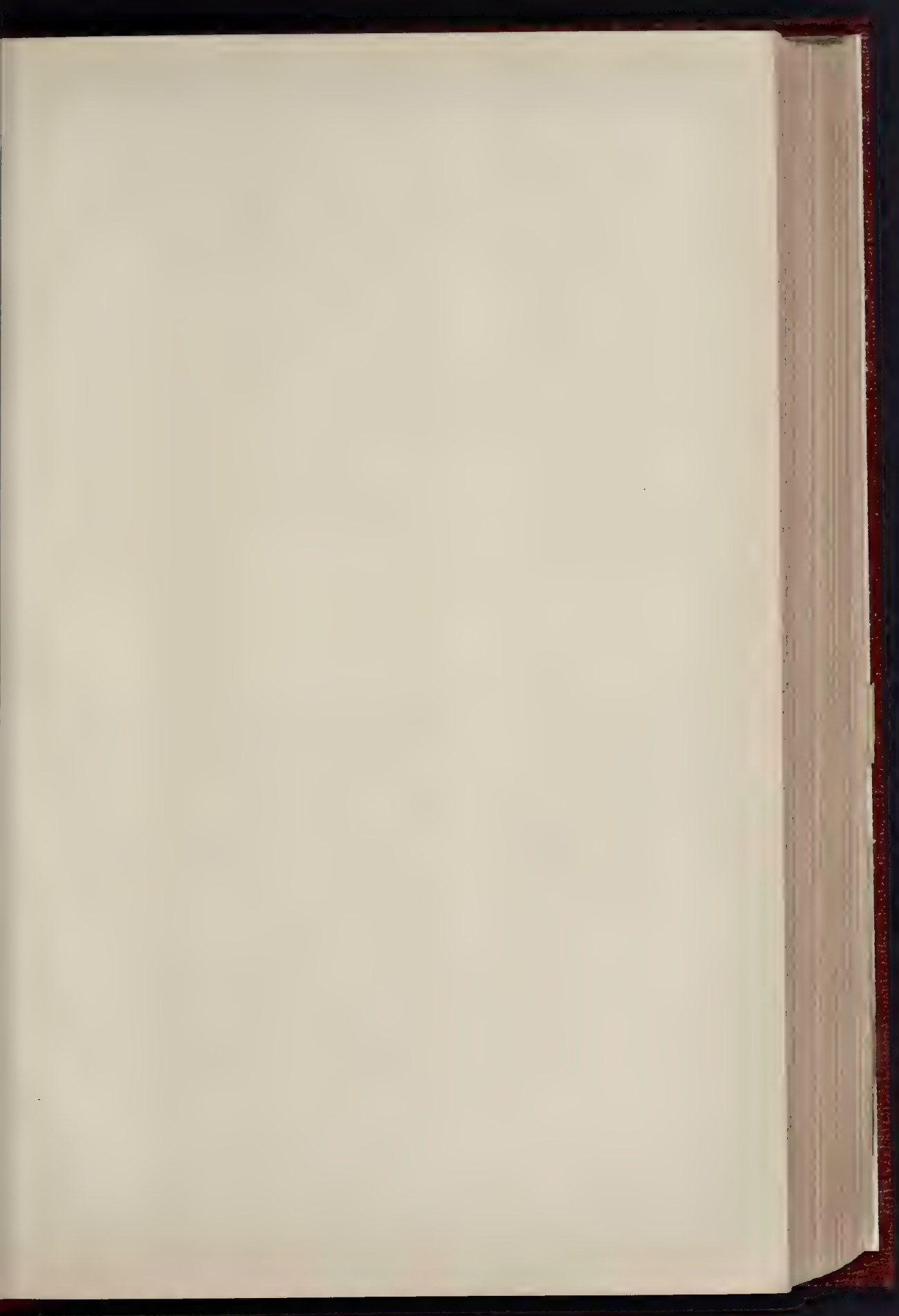
SOUTH ELEVATION



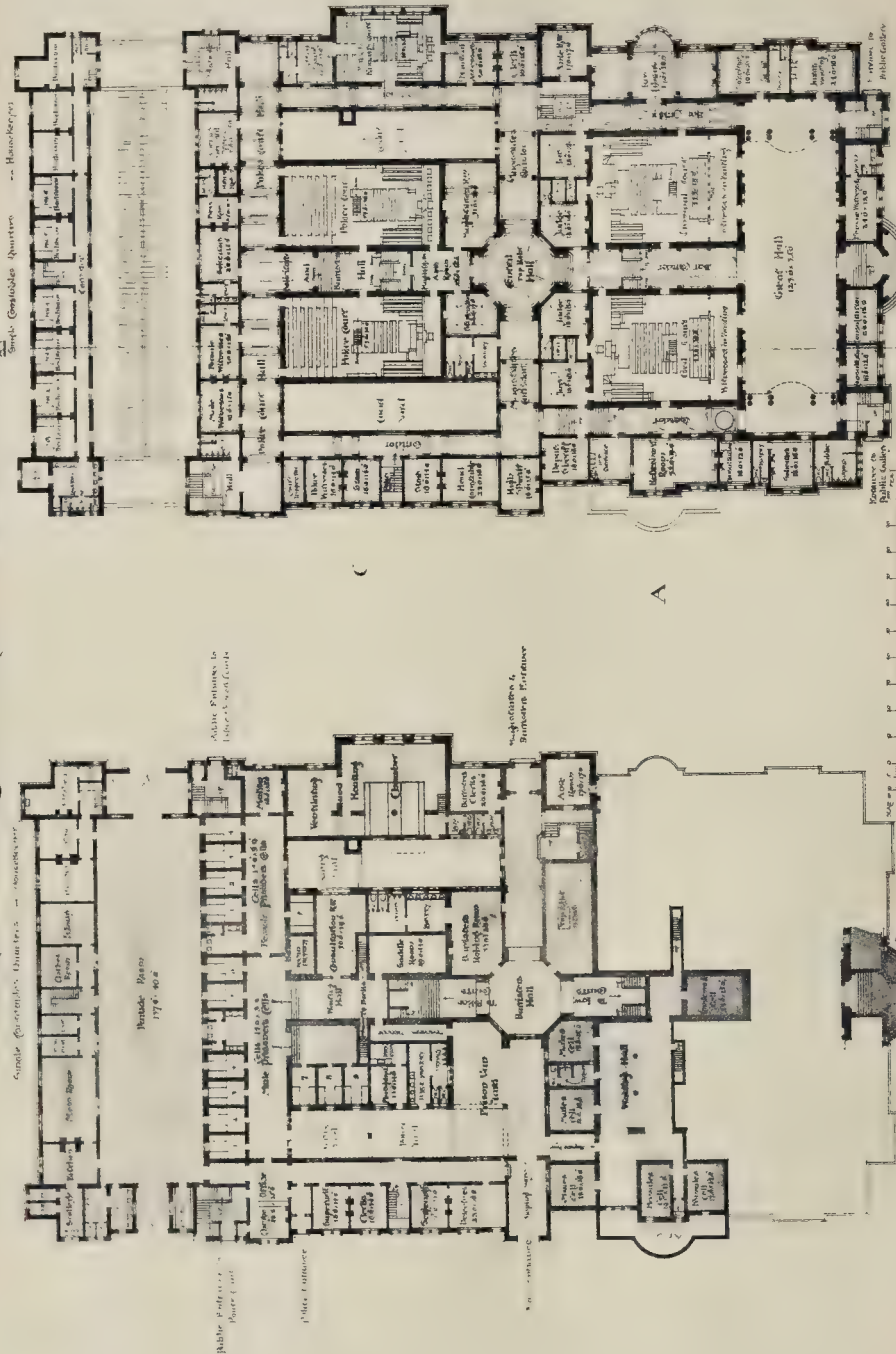
WEST ELEVATION

Scale 1/4" = 1' 0"

PHOTO LINDSAY & CO. 435 EAST HARDING STREET KETTER LANE E.C.



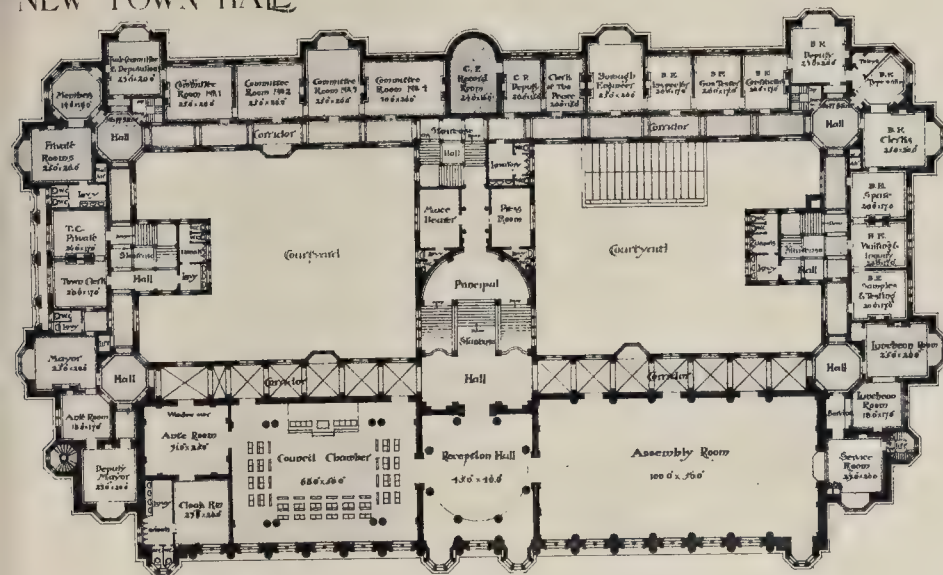
CARDIFF NEW LAW COURTS & POLICE OFFICES



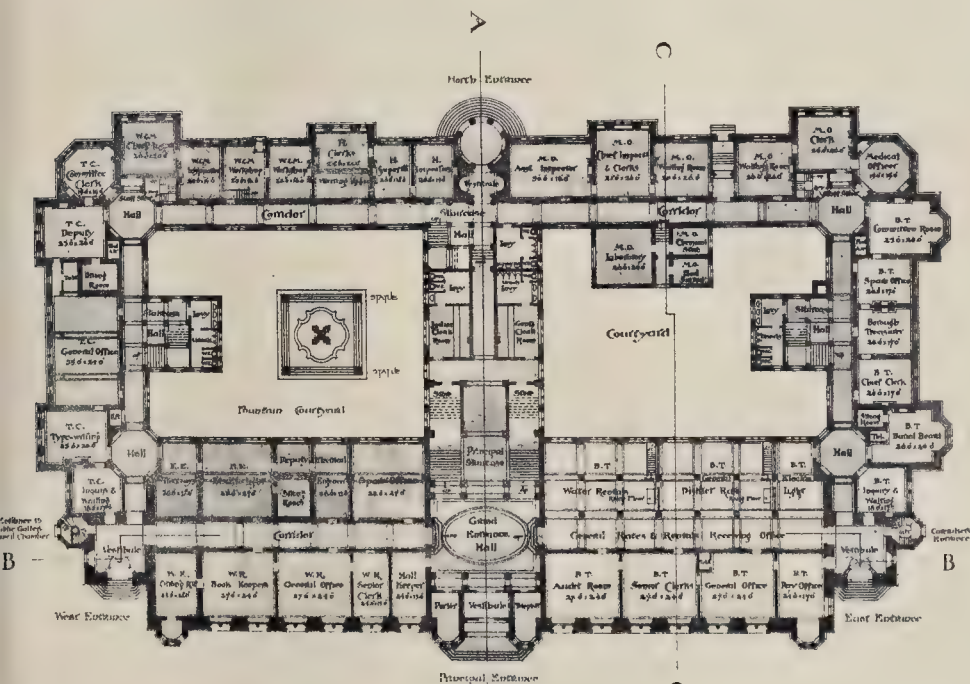
PRINCIPAL FLOOR PLAN

GROUND FLOOR PLAN

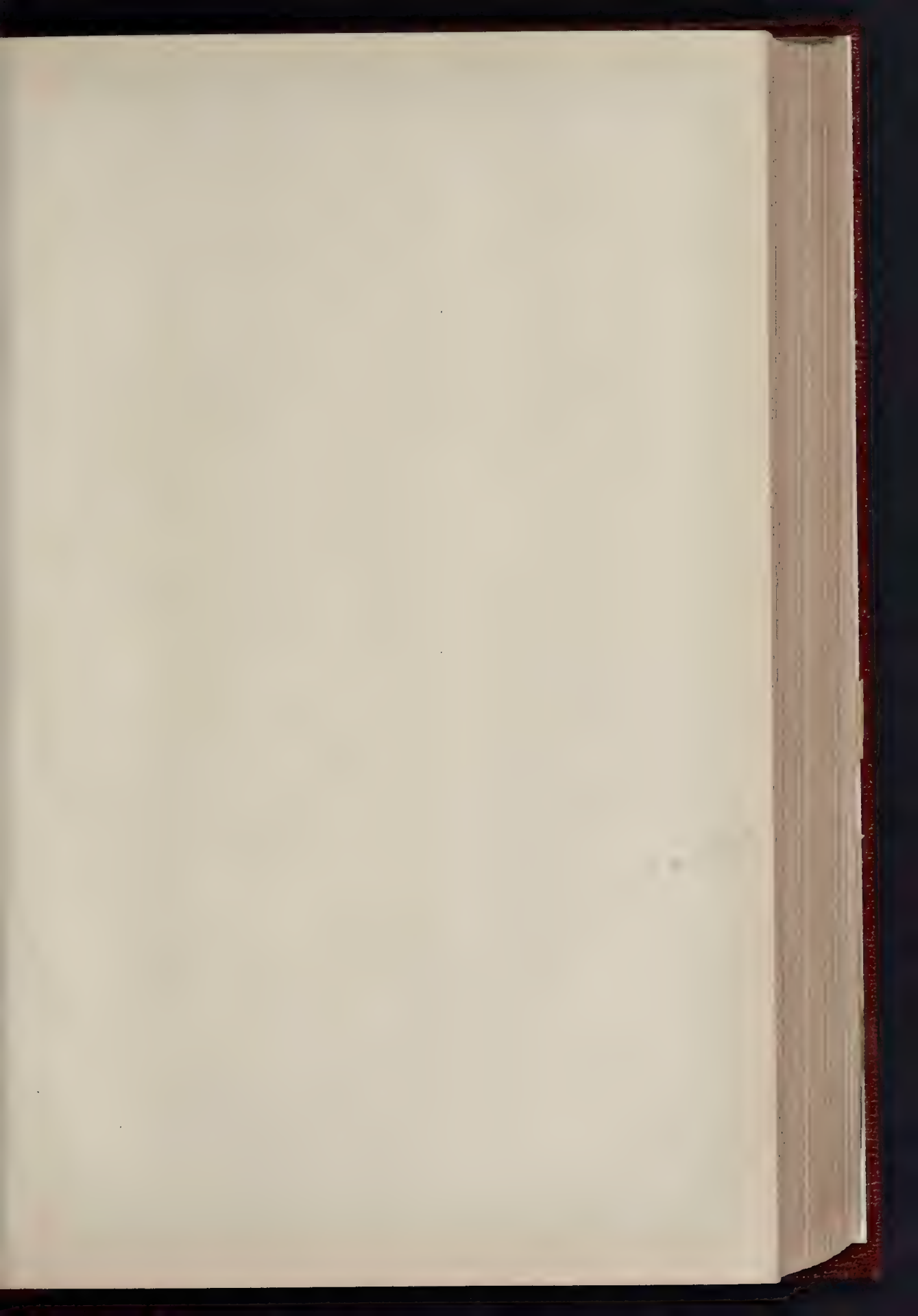
NEW TOWN HALL



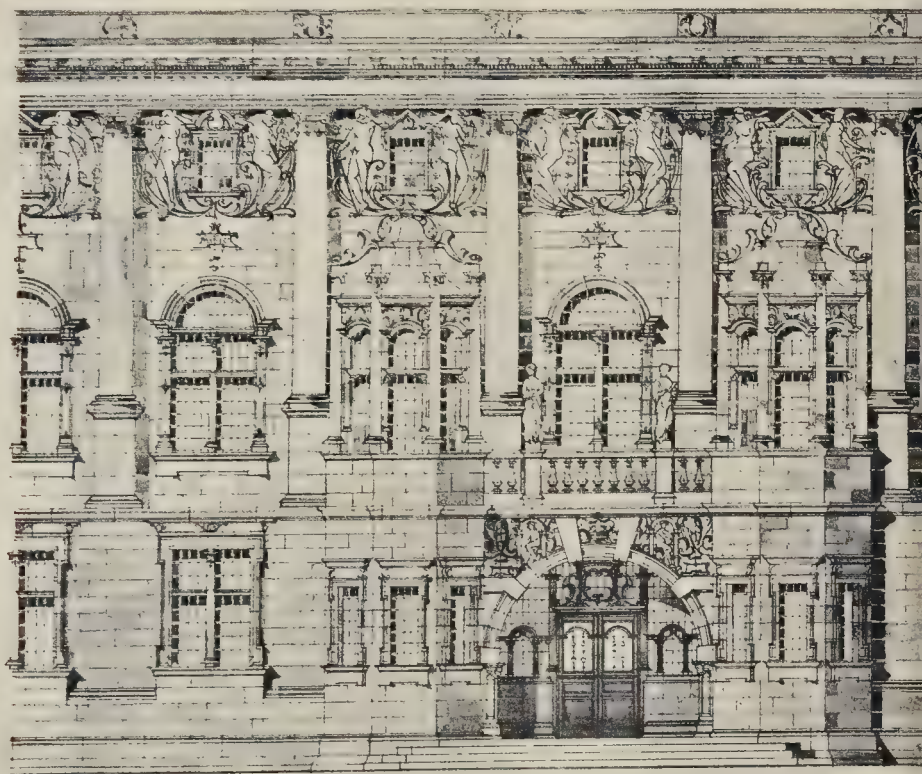
FIRST FLOOR PLAN



GROUND FLOOR PLAN

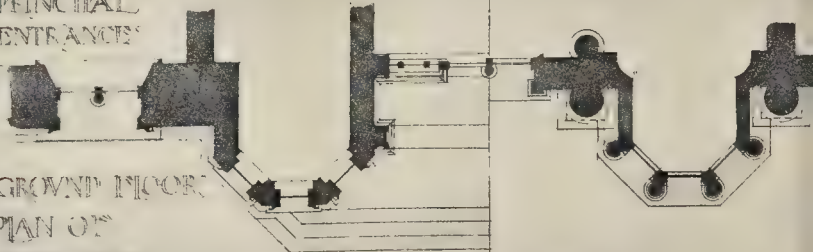


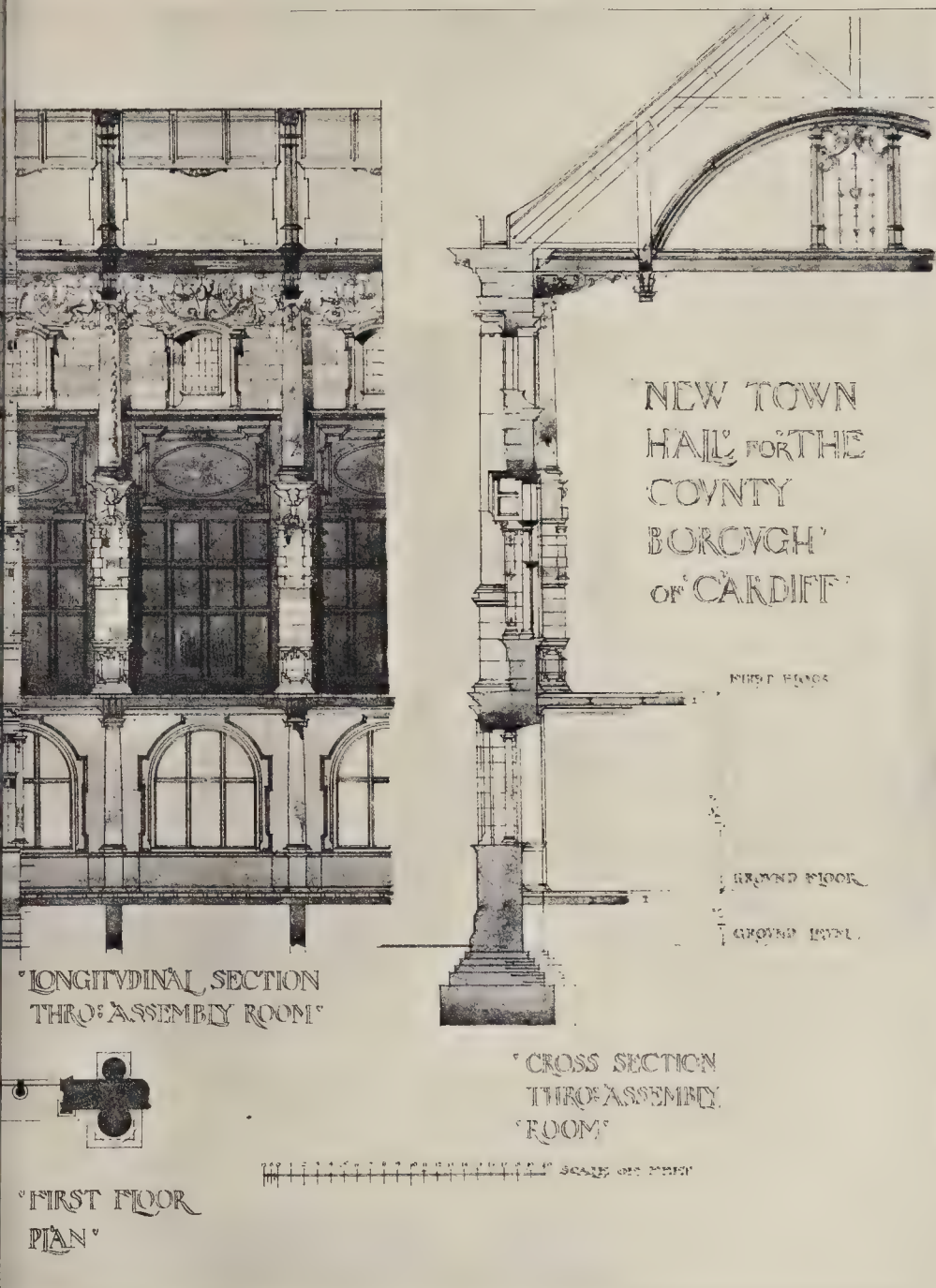
·DETAIL· ELEVATION· AND· SECTION·

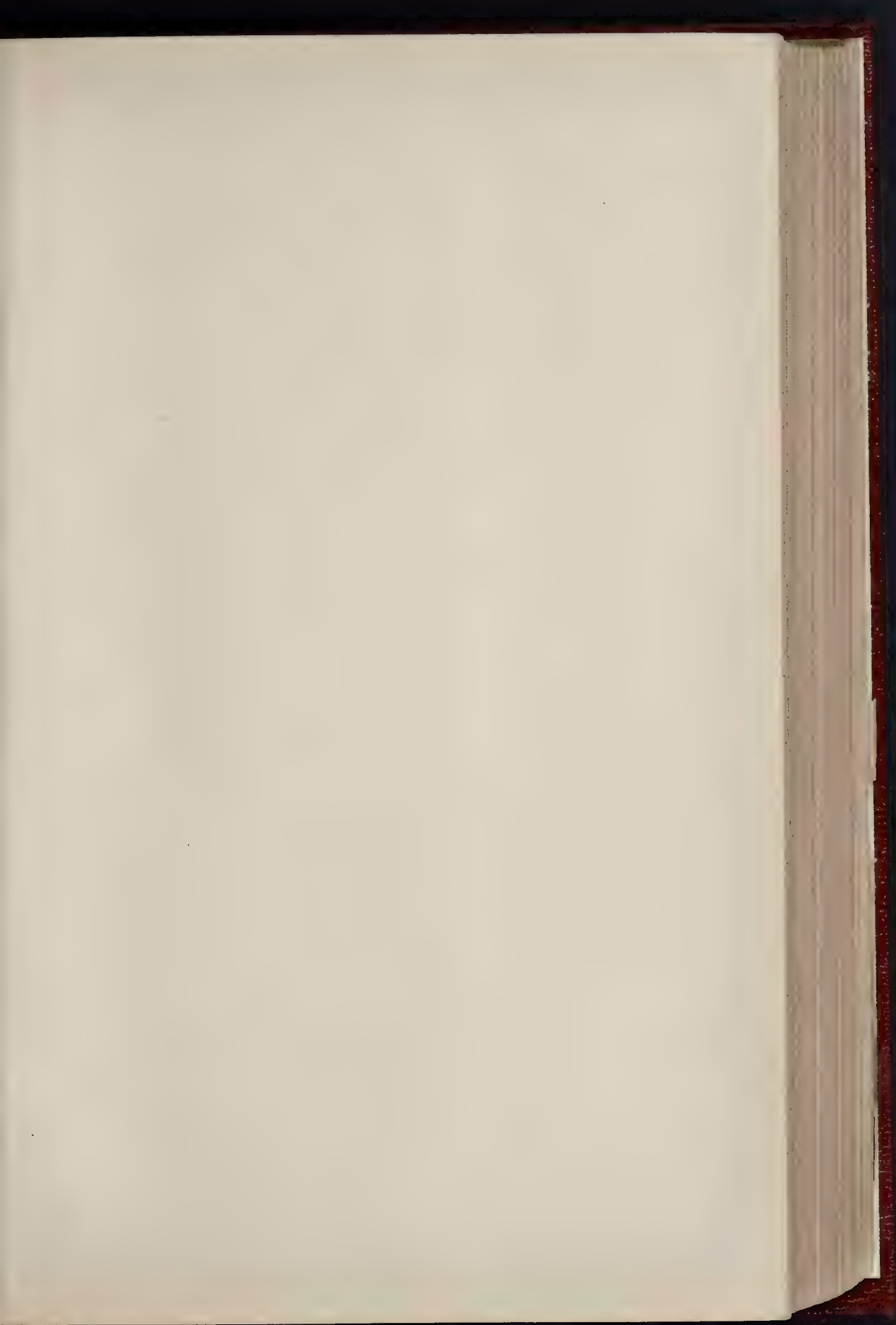


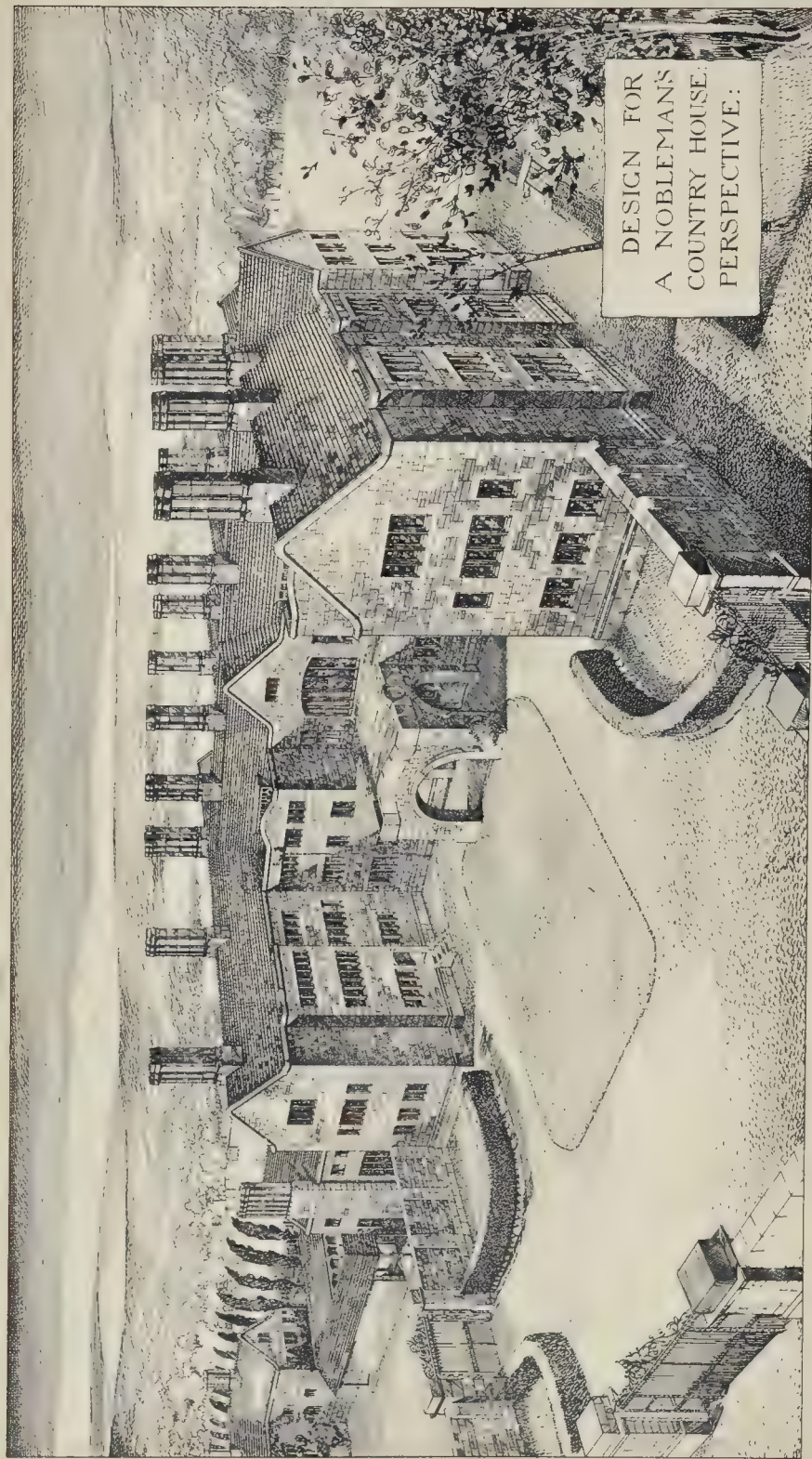
ELEVATION OF
PRINCIPAL
ENTRANCE

GROUND FLOOR
PLAN OF
ENTRANCE









DESIGN FOR
A NOBLEMAN'S
COUNTRY HOUSE.
PERSPECTIVE.

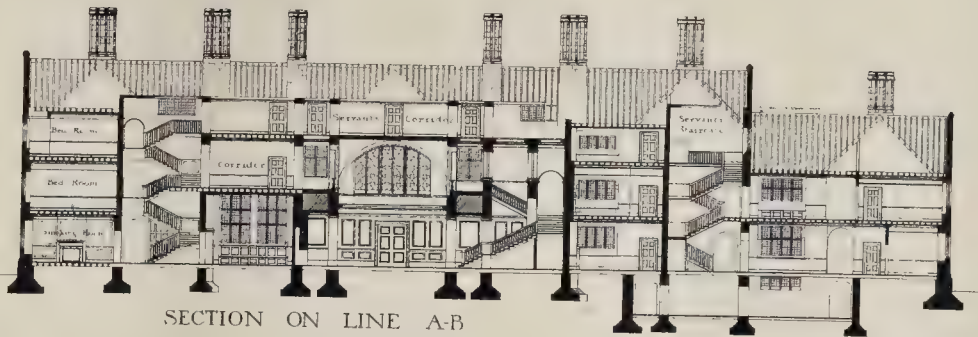
PLAN 75, 1/160. ELEV. 1/160. EAST. 1/160. WEST. 1/160. NORTH. 1/160. SOUTH. 1/160.

DESIGN FOR A NOBLEMAN'S COUNTRY HOUSE.—By MR. ARCHIBALD H. CHURCH.

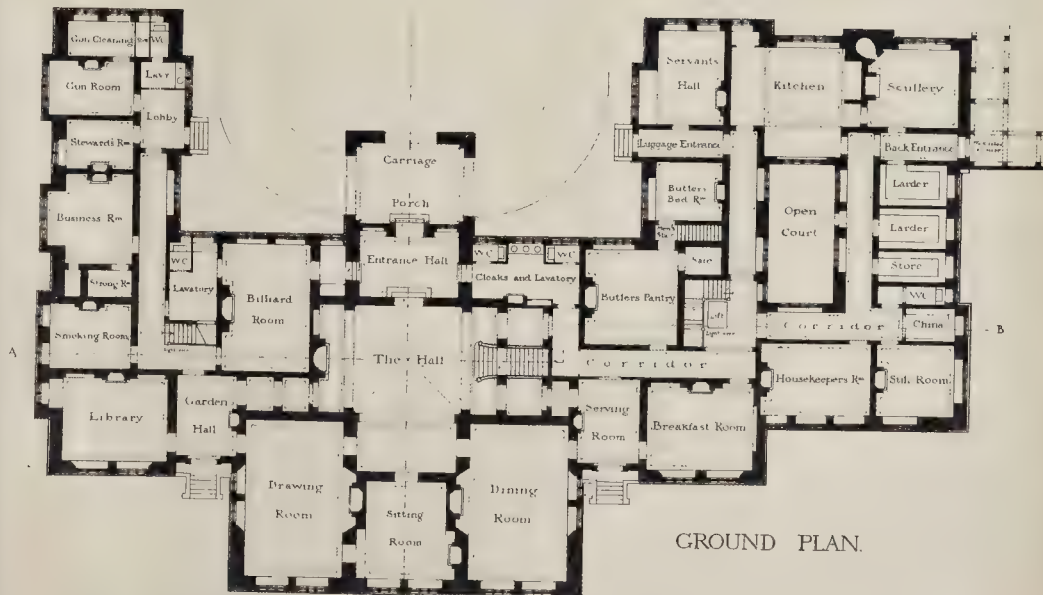
Royal Academy Gold Medal, &c.
1896. London, Sanderson, 1896.



GARDEN FRONT.



SECTION ON LINE A-B



GROUND PLAN.

PHOTO LITHO SPRAGUE & CO. 435 EAST HARRISON STREET FETTER LANE, E.C.

DESIGN FOR A NOBLEMAN'S COUNTRY HOUSE—BY MR. ARCHIBALD H. CHRISTIE

Royal Academy Gold Medal &
Traveling Studentship, 1891

Hints to Young Valuers: A Practical Treatise on the Valuation of Property. By ANTHONY RICHARD CRAGG, F.G.S., with Explanations of the Legal Principles involved, by JAMES ROBERT VERNAM MARCHANT, M.A., Barrister-at-Law. London: *The Land Agents' Record*, 1897.

THE first thing that strikes one in reading this most exhaustive and comprehensive work is the modesty of the authors in the selection of the title. While the book is full of the most valuable "hints to young valuers," we are inclined to the opinion that many practitioners who can no longer be included in this category will find, between the covers of this volume of over 600 pages, much information that will be found useful in dealing with those cases where it is difficult to find precedents, which fall to the lot of most professional men. The book, according to the authors' preface, is largely a reprint of articles in the *Land Agents' Record*, and no apology is needed from them for the republication in this form. The authors have done their work with commendable thoroughness, although there is rather a long list of errata, which, however, will probably disappear in subsequent editions.

The work embraces every phase of the practice of the valuer, from the simple valuation of new buildings at per foot cube, to the valuation of railways and mines for rating purposes, and bears the impress of being the outcome of practical experience.

While it is difficult in noticing a book which covers so much ground, to particularise, mention may be made of the chapter on "Timber and Plantations," which contains very useful information as to the character and uses of various descriptions of wood, the faults to be noted, the average values per foot cube and the expenditure in converting trees for the market compared with the value after conversion. Again, in the chapter on "Farm Valuation," the details of tilling and harvesting operations will be of interest to the valuer, as will also the comparisons between expenditure and income in the chapter on valuation for rent. Throughout the book the authors have given careful examples of reports upon the thousand and one different matters that come before the professional valuer, together with figures showing the outgoings and incomings on every description of property; these, of course, can only be taken as approximate guides, owing to the variations in different parts of the country. In the chapter on "Valuation of Landed Estates for Sale," in addition to much valuable information as to the cost of repairs, the student is given a list of the various details to be looked to, as to the state of the buildings, that many an experienced valuer will appreciate.

Amongst those chapters of general interest, that on "Dilapidations" will appeal to most of those professional men for whom the work is designed, and the authors have managed to compress in a comparatively short chapter, a fund of information that cannot fail to be of great value, while the portion of the chapter with the sub-heading "Survey of Dilapidations" will be much appreciated by the young surveyor when he receives, with much trepidation, his instructions either to make a claim, or to oppose one as the case may be. The much-quoted question of "Fixtures" has also a chapter devoted to it.

The young surveyor will also doubtless much appreciate the various guides in looking for the advantages and disadvantages in forming opinions as to the valuation of different classes of property, while the various details given cannot fail to be of value to those of more mature experience.

The advantages of the collaboration of the "surveyor" and the "lawyer" is evident throughout the book, and the authors are to be congratulated on the production of a work, which will, as they hope in the preface, doubtless "supply a long-felt want," and which will, if we are not mistaken, run through many editions.

BOOKS RECEIVED.

NOTES ON CARPENTRY AND JOINERY (Adapted to meet the requirements of the City and Guilds of London Institute, the Technical Education Board of the London County Council, &c.)—Vol. I. By Thomas Jay Evans. (Chapman & Hall.)

INDUSTRIAL DEMOCRACY.—By Sidney and Beatrice Webb. 2 vols. (Longmans, Green & Co.)

HINTS TO YOUNG VALUERS.—A practical treatise on the valuation of property. By Anthony Richard Cragg, F.G.S. (*Land Agent's Record* Office.)

LOCKWOOD'S PRICE BOOK FOR 1898.—(Crosby Lockwood & Co.)

PARTY STRUCTURES.—London Building Act, 1894: Part VIII. By Sidney Perks. (The St. Bride's Press.)

Correspondence.

To the Editor of THE BUILDER.

HARD CEMENT ON WALLS.

SIR.—Mr. Crace in his letter on page 22 of your last issue, says, "new brick walls should never be plastered with Parian cement if they are to be decorated, for a destructive efflorescence will assuredly injure or destroy the decoration."

Would he kindly advise (1) whether the same remark applies to the other hard plasters of the same class such as Keen's, Martin's, &c.; (2) whether any difference in result would be obtained as between building the walls in lime mortar or Portland cement mortar; (3) whether if the cement plastering were put on the newly-built wall and both wall and plastering allowed to get thoroughly dry before painting the evil would be avoided?

A further question to be considered, not only by Mr. Crace but by others of your readers, is whether it is safe to seal up the moisture in a new internal brick wall by plastering it on both sides with such plasters as above referred to. Would not the plaster be thrown off on one or both sides? More especially in the case of a wall built with lime mortar.

H. W.

THE SOLID WOOD FLOOR.

SIR.—I notice in your publication for this week a letter signed "A. B. P." calling attention to the patent fire-resisting wood floor, of which I was the original inventor.

The idea first occurred to me when designing a wood floor for a loft over a coachhouse, the span being wide, and no possibility of using intermediate supports, and great weight-carrying power being required for storage of corn, roots, and other weighty materials; and I immediately perceived what perfect fire-resisting properties such a floor would possess.

I communicated the original idea to my friend, Mr. George Evans, and together we thought out and perfected it, and eventually, in the year 1876, obtained a joint patent for the same and introduced it to the public as "Evans & Swain's patent fire-proof floor."

We subjected one of our floors to a most severe trial on April 16, 1877, and any person interested in the matter can read an account of this trial in the *Times* for April 20, 1877, the *Railway Record*, April 21, 1877, and the *Metropolitan*, of same date.

Our floors have been used for various buildings, amongst others the East and West India Dock extension at Blackwall, and the premises of Messrs. Cow, waterproofer, &c., in Cheapside; but as yet none of them have been subjected to the test of an actual fire.

I am perfectly certain of this, that had the warehouse in which the great City fire broke out been properly designed with regard to openings, and the floors constructed on our principles, the fire would have been confined to the one department in which it first originated.

I have no monetary interest in bringing these facts to your notice, as I believe the patent has run out. I only know that I have never received a penny from it, and my friend and partner, Mr. Evans, has lost a very considerable sum through it.

ROBERT SWAIN.

SIR.—In answer to A. B. P.'s letter in your issue of the 1st inst. re method of constructing the above floors, I beg to say that reference is given to the subject in "C. F. Mitchell's Building Construction," Vol. II (p. 310), where a method is described as "Messrs. Evans & Swain's." I presume this is the same as mentioned by your correspondent, but I notice "Swain" is spelt without the letter 'e' at the end.

ANDREW SOUTH.

LICHFIELD NURSING HOME COMPETITION.

SIR.—In September last you published particulars of a small competition for a nursing home and invalids' kitchen at Lichfield. The designs were to be sent in by October 18. Mine were sent in by that date, and up to the present I have received no communication as to the result.

Surely, if such a competition as that at Cardiff can be settled in a week, the result of this one, which is only a matter of 800l., should be published by this time.

A COMPETITOR.

KING-STREET POLICE-STATION.—It is stated that the Police Commissioners have arranged to take over from the Civil Service Commissioners a plot of ground in Cannon-row, for the erection of a new station in place of that in King-street, which will be absorbed for the new Government offices on what is known as the "Parliament-street site."

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—II.

HAVING thus investigated the manner in which this formula ($W = \frac{CBD^2}{L}$)

is arrived at, and supposing our student to have mastered the formula and its meaning, the next step will be to acquire facility in the manipulation of the formula to solve any particular problem, and for this purpose we shall do well to work out a few examples. Let us take the following problem:—

What will be the breaking weight in the centre of a fir beam 6 in. by 9 in., and 12 ft.

span? Write down the formula: $W = \frac{CBD^2}{L}$

Here we have to find the value of W. We have given to us the values B=6, D=9, and L=12: we therefore substitute these values in our formula, remembering also that, as we are going to find the breaking weight in the centre, our value for C is $3\frac{1}{2}$ cwt. Thus we have $W = \frac{3\frac{1}{2} \times 6 \times 9^2}{12}$. Cancelling the 6 into the 12 we have

$$W = \frac{3\frac{1}{2} \times 9^2}{2} \\ = \frac{3 \times 9^2}{2} + \frac{1 \times 9^2}{2} \\ = 141\frac{1}{2} \text{ cwt.}$$

This is a simple enough example. Now let us suppose one a trifle more difficult:—A beam 8 in. by 12 in. has to carry a load of 5 tons distributed. Over what span can this be safely done? Again write down the formula:—

$W = \frac{CBD^2}{L}$ As in this case we wish to find the value of L, and not that of W, it is advisable to transpose our formula, which we do in this manner,—multiply both sides of the equation by L, and divide both sides by W. Thus we get:—

$$L = \frac{CBD^2}{W}$$

Here W equals 100, B=8, D=12, and as W is the safe load distributed, C has the value $1\frac{1}{2}$. Substitute these figures in our formula, and we get

$$L = \frac{1\frac{1}{2} \times 8 \times 12 \times 12}{100}$$

As our denominator here is 100, it is not worth while cancelling out, and multiplying the factors in the numerator, we get:—

$$L = \frac{14 \times 144 \times 2016}{100} = 20'16 \text{ ft.}$$

which is the answer to our problem.

Similarly we should work out any examples in which either the breadth or depth were required, but the most usual form of problem is that in which the value of both breadth and depth have to be found, and this is somewhat more difficult. Let us therefore work out an example of this kind:—

What must be the scantling of a fir beam to carry a central load of 3 tons over 15 ft. span?

Writing down our formula $W = \frac{CBD^2}{L}$,

transposing this by multiplying both sides by L and dividing by C, we get:—

$$BD^2 = \frac{W \times L}{C}$$

Here the value of W is 60, of L 15, and as W is the safe central load our appropriate value for C is $\frac{1}{2}$. Thus we have:—

$$BD^2 = \frac{60 \times 15}{\frac{1}{2}} = \frac{60 \times 15 \times 2}{1} = 1800$$

Now we come to the chief difficulty in problems of this class.

We have, as you see, only one equation from which to ascertain the values of two unknown quantities B and D; in dealing with timber beams, however, we know by experiment and experience that, to obtain the most advantageous results, certain proportions of the section will be most economical. This is stated by Hurst to be a proportion of 5 to 7 between the breadth and depth; at the examination the proportion of 2 to 3 is more usually taken, as it is also in

practice. Let us, then, assume this proportion and say:—

$$\text{Let } D = \frac{3B}{2} \text{ then:—}$$

$$BD^2 = \frac{9B^3}{4} \text{ We have already the value for}$$

$$BD^2 = \frac{60 \times 15 \times 8}{4} \text{ therefore, equating}$$

$$\text{these, we get:—} \frac{9B^3}{4} = \frac{60 \times 15 \times 8}{4} \text{ To sim-}$$

plify this equation we multiply both sides by 4 and divide by 9. Thus we get:—

$$B^3 = \frac{60 \times 15 \times 8 \times 4}{9}$$

$$= \frac{20 \times 5 \times 8 \times 4}{3}$$

$$= \frac{3200}{3}$$

$$= \frac{450}{3}$$

$$\text{and } B = \sqrt[3]{450}.$$

This cube root we can arrive at with sufficient accuracy by what is called the method of inspection, which is thus performed: looking at 450 we see that its cube root must be less than 10, because the cube of 10 is 1000, and, making a mental calculation, we see that the cube of 7 is 343 and the cube of 8 is 512. The cube root of 450 is therefore between 7 and 8 and very much nearer 8 than 7; therefore we say, in our answer to the examination question, $B = 7\frac{3}{4}$.

We have already assumed

$$D = \frac{3B}{2}$$

$$\text{therefore } D = 3 \times 7\frac{3}{4}$$

$$= 11\frac{1}{2}$$

The size of our beam, therefore, is $7\frac{3}{4} \times 11\frac{1}{2}$.

Corresponding with the formula for timber beams which we have been studying, there is a formula very similar in appearance sometimes used for rough calculations with iron girders. It is

$$W = \frac{CAD}{L} \text{ where } A \text{ is the sectional area}$$

of the bottom flange in inches, D the depth of the girder in inches, L the length of the span in feet; whilst C , the constant, is in this formula usually given in tons instead of cwts. as in the case of the timber formula. The value of C for the breaking load in the centre is, in the case of riveted plate girders, 6 tons, for box girders $6\frac{1}{2}$ tons, and for rolled iron joists 7 tons. The constant for the distributed breaking weight and for safe load, whether central or distributed, can be obtained from these in exactly the same way as in the case of the constant for the timber beam. Working out of this formula is naturally enough very similar to that we have been considering for timber beams. But there is one point of difference which the inexperienced student should be careful to notice, and that is, that in this case usually, when we require to find the size of an iron girder to do a definite piece of work, we have two unknown quantities in our formula, the A and the D , between which there is no readily applicable and universal proportion, because the A is partly made up of the thickness of the bottom flange, which has no imperatively necessary connexion with the depth or other dimensions of the girder.

The simplest way, therefore, in problems of this nature is to assume such a depth for the girder as experience has shown to be generally satisfactory. In ordinary cases iron girders have a depth of from 1-12th to 1-15th of their span, and the student may, therefore, assume the depth of his girder in this way. As an illustration we will work out a simple problem, making use of this formula, in answer to the question:—What must be the size of a rivetted girder to carry a distributed load of 20 tons over a span of 15 ft.? Using the formula

$$W = \frac{CAD}{L}; \text{ in this case we have given the}$$

values for $W = 20$, $L = 15$, and $C = 3$, because W means safe distributed load. We then assume $D = 15$, which is 1-12th of the span. Now, transposing our formula by multiplying both sides by L and dividing by $C D$ we have

$$A = \frac{WL}{CD}$$

$$= \frac{20 \times 15}{3 \times 15}$$

$$= \frac{61\frac{2}{3}}{3}$$

That is the sectional area of the bottom of the flange in inches.

This formula, although a very simple one to

remember and to use for calculating the size of iron girders, must not be supposed by the student to be one of any very great value if he desires to design his iron work with any approach to that scientific accuracy and economy which the capabilities and costliness of the material admit and necessitate. It is a formula which is useful in actual practice for rough calculations, and to the student it has a more important interest; it is a formula frequently made use of by examiners to test in a very moderate degree the mathematical abilities of the architectural student. It is clear at once that the formula gives no information as to the possibility of economising the iron or steel in the girder by placing the material only where it is wanted, or, in other words, increasing the sectional area of the girder at the parts where the greatest stress is to be resisted.

Moreover, if our student desires to put to a practical use the information he has already obtained in working out the problem given above, he will at once find that there is a variety of opinion as to how the sectional area of the bottom flange is to be calculated. In actual practice different men have different ways of calculating this sectional area of the bottom flange. Some take the sectional area of the plates plus the sectional area of the two angle irons, and deduct for the rivet holes. Others take the bottom plates and one angle iron, and make no deduction for the rivets; others, again, would estimate the sectional area of the bottom plates only, as being the value that should be given to A , leaving out of account the angle irons and rivet holes altogether. In applying this formula to rolled iron joists where there is no question of rivet holes, it is a very common practice to estimate for the value of A the sectional area of the lowest quarter of the joist, that is, the actual bottom flange and the portion of the web comprised in the lowest quarter of the joist.

OBITUARY.

MR. C. K. BEDELLS.—Dr. Thomas held an inquest on the 1st inst., on Charles K. Bedells, 65, architect and surveyor to the Harpur estate, lately residing at Toff Lodge, Hornsey-lane. The evidence showed that the deceased was taken with a fainting attack, and the concussion of the fall caused a rupture of a blood-vessel on the brain and death.—A verdict of "accidental death" was returned.

MR. W. WARRICK.—Mr. William Warbrick, a master builder of Lancaster, died at the Eastern Royal Infirmary (which institution he had built), aged 64.

MR. W. J. LINTON.—The death is announced at Newhaven, U.S.A., of Mr. William James Linton, wood engraver. Born in 1812, he was trained to the art of engraving by Mr. G. W. Bonner and Mr. Orrin Smith. With the latter he executed some of the first works of importance published in the *Illustrated London News*, and ultimately he attained the highest rank as an engraver on wood. Besides contributions to the *Examiner*, *Spectator*, and *Westminster Review* he wrote the following works amongst others:—A series of "The Works of Deceased British Artists," 1860; "Practical Hints on Wood Engraving," 1879; "A History of Wood Engraving in America," 1882; and "A Manual of Wood Engraving," 1884. For a work on the "Lake District," written by his wife, he executed a series of engravings. In 1889, he published by subscription his work on "The Masters of Wood Engraving." In 1893 appeared his "Life of Whittier," and in 1895 his own "Reminiscences." He was a member of the American Society of Painters in Water Colours and also a member of the National Academy of Design.—*Times*.

GENERAL BUILDING NEWS.

RESTORATION OF KEYSTON CHURCH, YORKSHIRE.—A further step towards the complete restoration of this church has just been completed by the repair of the roofs of the south transept and south aisle. The principal timbers have been restored in oak, following the lines of the old work, and new lead has been substituted for the old. The work has been carried out by Mr. Pettit, of Thrapston, under the superintendence of Mr. H. M. Townsend, architect, of Peterborough. The previous restoration of the spire and new roof were also executed under the advice of the same architect.

CHURCH, CLEISH, KINROSS-SHIRE.—The Parish Church of Cleish was reopened on the 19th ult., after having undergone additions and improvements. A Norman tower has been built at the south-west corner of the church, and bears the following inscription under the belfry:—"In the sixtieth year of the reign of her Majesty Queen Victoria the tower and chancel were added to this church, 1897." In the interior alterations the former galleries have

been removed and a single new one has been placed at the west end of the church. A pitch-pine pulpit occupies the north corner of the chancel arch, and the whole area of the church has been reslated with pews. The windows have been made to harmonise with those in the chancel, and are all filled in with tinted cathedral glass. The architects were Messrs. Hardy & Wright, Edinburgh; masons, Messrs. J. Miller & Sons, Cowdenbeath; joiner, Mr. Rutherford, Blairadam; painters, Messrs. Dobie & Son, Edinburgh; glaziers, Messrs. Dickson & Bell, Edinburgh; plasterer, Mr. A. E. Hutchison, Kinross; plumber and slater, Mr. G. Porteous, Kinross.

FREE CHURCH HALL, INVERNESS.—The Crown Free Church Hall, Inverness, has just been opened. Mr. James Rhind was the architect. The elevation to Kingsmill-road shows three large doors and a rose window. In the church the seats will be semi-circular, with a slope towards the centre; while in the hall, accommodation has been provided for about 400 persons.

WESLEYAN METHODIST SCHOOL CHAPEL, SHEFFIELD.—The Wesleyan Methodists of the Sheffield Park Circuit have secured a site of over 1,000 square yards in the centre of the Stanforth estate, for the purpose of erecting chapel, schools, and vestries. The trustees have decided to erect, as part of the permanent scheme, a school chapel, with two vestries, with an accommodation for 250 people. Mr. John Hardcastle prepared the plans, and Mr. William Aspland, of Handsworth, has undertaken the contract.

PRIMITIVE METHODIST CHAPEL, HIGH WYCOMBE.—A new chapel has been erected for the Westbourne-street Primitive Methodists, High Wycombe. The new edifice was built from plans prepared by Mr. T. Thurlow, architect, of High Wycombe. It is of red brick, with Bath stone dressings. Messrs. Nash & Sons, of High Wycombe, were the builders. PRIMITIVE METHODIST CHAPEL, SOMERSET.—A new chapel is being erected at Somercoates for the Primitive Methodists, from plans prepared by Mr. F. S. Antill, architect, Draycott. The whole edifice will have a seating capacity for about 300 persons, while its total cost, including the site, will be about 1,000l. The contract has been let to Messrs. E. Brothers, of Bradford, for 900l.

SCHOOL EXTENSION, DOVER.—New class-rooms have been erected in Queen-street, Dover, in the same block as the boys' schools, to provide part of the extra accommodation demanded by the Council of Education. The two new rooms provide seats for 104 pupils each. The work has been carried out by Messrs. Austin & Lewis, builders, from the designs of the architects, Messrs. Worsfold & Hayward.

ENLARGEMENT OF WARE GRAMMAR SCHOOL.—Additions to the Ware Grammar School have just been carried out. The enlargement of the school was effected as a Diamond Jubilee memorial, and the added portion consists of a class-room, porch, master's room, and new offices. Mr. E. S. Martineau, of London, was the architect, and the contract was placed in the hands of Mr. S. Goodman, builder, Ware.

PROPOSED SCHOOLS, GREAT LEVER.—It is proposed to erect new schools in Rishton-lane. The intention is first to erect schools, then will follow a church, the desire being to also provide a parsonage. Plans for the whole of the buildings are in course of preparation by Mr. R. K. Freeman, architect, Manchester.

NEW WING, DOVER HOSPITAL.—A new wing has just been added to Dover Hospital in commemoration of the Queen's Diamond Jubilee. It comprises an additional women's ward, now to be known as the Victoria Ward. This was constructed by extending an old room 30 ft., and thereby making a large ward 35 ft. by 60 ft. To this is attached a bathroom, sink, and lavatory. On the ground floor similar sanitary arrangements have been added, and the old bath-room, a small apartment, will in future be utilised as a pantry. In addition, a separate building, known as the isolation ward, opening out of the passage between the men's wards on the ground floor, has been constructed for the use of any infected patients. The work has been carried out, in accordance with plans prepared by Messrs. Fry & Gardiner, by Messrs. Austin & Lewis, builders and contractors.

CRYDON RURAL DISTRICT ISOLATION HOSPITAL.—At Beddington Corner, Mitcham, on the 1st inst., the foundation stone of an Isolation Hospital for the Croydon Rural District Council was laid by Mr. James Williams, Chairman of the Council. The buildings will comprise an entrance lodge, administrative block, with accommodation for doctor, matron, nine nurses, and six servants. Three ward blocks, with accommodation for twenty-eight patients, mortuary, discharging room, and stable, laundry, and disinfecting block. The latter will serve as a disinfecting station for the whole district, and will be fitted with a Washington Lyons patent disinfectant. An underground rain-water tank of 15,000 gallons capacity is provided to collect the rain-water for use in the laundry. The architects are Messrs. R. M. Chart & Son, of Croydon, and the contractors, Messrs. D. Stewart & Sons, of Wallington, the amount of their contract being 15,878l.

NEW BANK, WREXHAM.—The new premises for Part's Bank, Wrexham, are situated at the top of High-street. The ground floor, with the exception of the side entrance passage and staircase to the

upper floors, is given up to the bank, and consists of a banking-room 24 ft. square, and manager's room, a strong-room and plate-store-room, voucher store, private room, lavatory for officials, heating apparatus, and coal store, are situated in the basement, to which access is provided by a staircase below the banking-room, and a door leading to the bank. Above the banking-room are the offices, and care-taker's accommodation in an attic formed entirely in the roof. The exterior façades are executed entirely in stone of two shades of colour, from the Ambury quarries of the contractors, Messrs. Davies Bros., and are treated in a phase of English Renaissance. The basement, ground and first floors, are constructed of concrete embedding rolled steel joists. The public space and main vestibule are finished in encaustic tiles by Mr. J. C. Edwards, who also executed the wall tiling to the side entrance vestibule, staircase passages, and lavatories. The two lower staircases are constructed of concrete. The exterior carving is the work of Mr. F. G. Floyd, of Manchester. The whole of the structural work has been carried out by Messrs. Davies Bros., of Wrexham, who have also executed the oak fittings to the interior of the banking-room. The heating apparatus and lead lights to banking-room have been executed by Messrs. A. Seward & Co., of Lancaster, and the ceiling and cornices, &c., by Messrs. Thomas Cordingley & Sons, of Bradford. The places to banking-room and to offices on first floor are supplied by the Electric Fireproof Company, of London, and the gasfitting and ornamental iron-work by Messrs. Hardman, Powell, & Co., of Birmingham. Messrs. Waygood & Co. supplied the lift, and Messrs. Chubb & Co. the armour-plated doors to strong room and plate store. The window panes to the upper floors were manufactured by Messrs. R. L. Williams & Co., of Chester. The work has been carried out from the plans and under the superintendence of Mr. J. H. Swainson, architect, of Wrexham.

BRADFORD BUILDING AND STONE TRADES.—There has been a large amount of building done in Bradford during the past year. Of some of the more important buildings erected may be named a large extension to the dyeworks of Messrs. E. Ripley & Son, Bowling; the new loom works for Mr. G. H. Hodgson, at Frizinghall; a large block of shop premises on the Springfield estate, Manningham-lane, for Mr. D. W. Asman; a large pile of warehouses in Union-street, for Mr. George Newby; the nurses' block at the Royal Infirmary; nurses' homes at the Bradford Workhouse; the St. Catherine's Home, Manningham; and the restoration of Midland-buildings after the recent fire. During the year there has also been a considerable extension of house building on the outskirts of the city, chiefly of better-class artisans' dwellings, and the demand still continues. In consequence, several projects are afoot for opening up building ground, notably in the vicinity of Legrams. Notices for advances of wages have been received from stone-masons and joiners, also from the masons' labourers, to take effect next May. The stone trade has been good during the past year, both locally and for the London trade, and prices have hardened a little, but not much, during the year.

BUILDING TRADE IN BRECHIN.—The building trade in Brechin during the past year has been fairly active. At the junction of Damacre-road and South-street the Gardner Memorial Church, which is nearing completion so far as the mason work is concerned—completes the improvements at St. Ninian's-square. Another building finished during the year is the new Joint Infectious Disease Hospital, a brick erection. At the corner of Panmure-street and South-street a building has been erected for the Parish Council, from plans prepared by Mr. D. Wishart Galloway, architect. The prospects for the ensuing year are stated to be not so bright as at the same period last year.

BUILDING TRADE IN BRISTOL.—In Bristol the district the building trade has been marked during the past year by considerable activity, and although few buildings of great size or importance have been erected in the city, the trade generally has been good—probably better than for some years past. Prices have ruled slightly higher and considerably steadier. There have been no serious labour disputes, but certain branches of the trade have been affected by the existing strike in the engineering industry.

There has been well employed, and the supply of labour has been good. Speculative building has continued with customary activity, and several large estates have been laid out, the most important of these probably being that situate at the extreme end of Durdham Down, on the Westbury-road. Other portions of the city are considerably extending, notably, Brislington, Eastville, and Bishopston. Church building has not been so active as in former years, although a considerable amount of work has been done in that direction. The Church of St. Anselm, at Clifton, has been completed and opened; the ancient tower of St. Thomas has been thoroughly renovated; the restoration of the Cathedral has been continued, and a further portion of that work has been undertaken by Messrs. Cowlin & Son. Considerable improvements have been effected in the city, most notably in Baldwin-street, where new offices have been erected for the Board of Trade and

Inland Revenue Departments. The extensive additions to the lunatic asylum at Fishponds have been commenced.

BUILDING TRADE, COVENTRY.—The building trade in Coventry, in 1896, like the cycle industry, was unprecedentedly active. Sufficient workmen could not for a long time be obtained, and materials were scarce and dear. The beginning of the past year found builders almost as busy. Though the mild weather of the winter permitted of work being carried on uninterruptedly, there was plenty of work for the succeeding spring and summer. It may be said that trade has been brisk nearly the hands as in 1896, very few less. The conditions under which building has been carried on, and the character of the work, underwent considerable alteration in the last twelve months. In 1896, it was a difficult matter at times to get hands, and materials, particularly bricks, fetched prices that made their manufacture exceptionally remunerative. In 1897 there has been little trouble of this kind. There are plenty of workmen, and the price of bricks is much lower. Brickmakers, attracted by the extensive building operations, have sprung up in all directions, and the present output should be equal to any reasonable demands for some years to come. In 1896 the class of property put up consisted in great part of factories or extensions to factories. House building was somewhat neglected, with the result that there was a house famine. The year just closed has been devoted mainly to the erection of artisans' dwellings, of which an unusual number have been put up. Land has been developed in all directions. What the trade of 1898 will be like it is impossible to say. In the last few weeks there has been with some builders an appreciable falling off of work, and there seems to be an opinion that, after spring, building operations will sink to an ordinary level. It is improbable that many new cycle factories will be required next year, or for several years, and few extensions are likely to be necessary just yet after the additions that were almost generally made in 1896 and in the past year. Neither can the present demand for houses continue for ever.—*Coventry Herald.*

BUILDING TRADE, DUMFRIES.—The following is the estimated cost of buildings for which plans have been passed by the Dean of Guild Court during the past year:—Dwelling-houses, 11,203*l.*; business premises, 11,600*l.*; hotels, 1,150*l.*; school, 6,000*l.*; public baths and washhouse, 3,550*l.*; offices, stables, &c., 20*l.*—total, 32,523*l.* This represents the largest amount of building which has been sanctioned in any single year since the institution of the Court by the Police Act of 1892.

BUILDING TRADE, GLASGOW.—The building trades of Glasgow have been exceptionally busy during the past year. The total value of buildings passed through the Dean of Guild Court amounts to the aggregate of 1,851,000*l.*, being an increase of half a million sterling over the corresponding period last year. A large increase is taking place in the number of two-roomed tenements. In one, three, and four-roomed houses there has also been an increase, although not so marked as in the former class. The relations between the masters and the men have been on the whole satisfactory. This is in great measure due, it is stated, to the fact that they meet early each year in friendly conference and adjust the standard rate of wages and all other matters where friction has arisen between them. There has been a scarcity of labour in every department of the building trade during the past year, and artisans' wages never were higher.

THE BUILDING TRADE IN HALIFAX.—As was the case last year, the building trade here has been active throughout in Halifax, and this state of things is likely to continue for some time to come. A considerable number of dwelling houses have been erected during the year, and recently plans of many more have been passed. One of the large undertakings, in addition to the ordinary work, is the building of a workhouse hospital, which is now in progress. The Corporation are also finding work for a number of men in connexion with the tramways, &c. The same circumstance which was noted last year is again referred to by the masters, who state that there has been no difficulty in procuring unskilled labourers, but some employers have not been able at all times to secure the services of a requisite number of masons. It follows, as a matter of course almost, that joiners have met with plenty of work, and that they have shared in the activity which has characterised the building trade. It is worthy of mention that this year business failures have been comparatively few in the town and neighbourhood, and in no instance has the deficiency been very great.—*Leeds Mercury.*

BUILDING TRADE IN HUDDERSFIELD.—All the workmen of the Huddersfield district would have been fully employed at home the past year but for the strike of masons and labourers, which lasted fifteen of the summer weeks, ending in an increase of wages. Not very many houses have been erected, there being a large number still to let. Prospects are tolerably good for the present year. Almost all public works to be early undertaken will be the extension of Huddersfield Infirmary and of the Corporation electric lighting works.

BUILDING IN HULL.—The building trade in Hull has been exceedingly brisk during the past year, and workmen have been fully employed. Several mills,

principally for the flour trade, have been built on the east bank of the River Hull. A large number of houses have been built in both East and West Hull, but the only large building erected of importance, apart from the mills, is the new Palace Theatre, on the Anlaby-road, at a cost of 50,000*l.*

THE BUILDING TRADE IN INVERNESS.—For the past few years the building trade in Inverness has been attended with remarkable briskness. In the commencement and completion of important buildings the past year has indeed been specially noteworthy. Opening the year with abundance of work on hand, contractors have been fully employed. On October 15 last St. Stephen's Church, which has been erected in Barnhill district, was opened. The edifice cost about 3,400*l.* The Crown Free Church Hall has also been opened, and considerable progress is being made with the remodelling and enlarging of the old Free East Church in Academy-street. The Tweedmouth Memorial Chapel at the Northern Infirmary is also nearing completion. New premises for the trustees of the late Messrs. Strothers are being erected in Academy-street. Recently the Highland Railway Company purchased the house adjoining the Old Academy, and fronting Queensgate, with the object of forming a new entrance to the proposed new through station, and along this new roadway the trustees of Messrs. Strothers have erected a long range of warehouses. The new block, which is to cost 7,000*l.*, will have a frontage of 70 ft. to Academy-street and a frontage of 50 ft. to the railway thoroughfare. In Castle-street, there have been improvements during the year, and the same remark applies to the Exchange, Eastgate, Rose-street, and many other thoroughfares. Tenement building has also been very brisk, and plans have been passed for the erection of several large blocks of houses in various parts of the town. There is good reason to believe that the outlook for 1898 is as bright as it was at the beginning of last year, and therefore the building trade may expect to enjoy another period of unbroken prosperity. It is contemplated to erect new prison buildings at Inverness.—*Dundee Advertiser.*

BUILDING TRADE, LEEDS.—The building trade of Leeds and district has been brisker during the past twelve months than for many years. The supply of materials and labour has fallen considerably short of the demand. Owing to the stoppage of work for about twenty-two weeks in 1896, occasioned by the bricklayers' and labourers' strike, business had not regained its normal condition at the beginning of last year—a fact which, combined with the great increase of building work at the same period, placed serious obstacles in the way of contractors making satisfactory progress with the works under their charge. Employers have experienced much difficulty in obtaining a sufficient number of good skilled workmen to keep pace with the contracts offered to them, and, in some instances, they have been compelled to decline contracts on account of the expense of and delay in obtaining labour and necessary materials. Brickmaking firms and stone quarry masters have failed to meet the large demands made upon them. All the brickyards in the city have been in full swing during the whole of the year, and large quantities of material have been procured from Harrogate, Bradford, Wakefield, Laisterdyke, and other places. Notwithstanding this assistance partial stoppages have arisen. The standard price of bricks has not been altered by any general combination of makers, though firms have been able to make their own special terms and to sell to their best customers at advanced rates. The latter have readily agreed to the demand in the hope of securing a fair share of the limited output. The demand for fine clay goods and glazed bricks has also been good. The Leeds quarry owners have been unable to meet the demand for outside building dimension stone, and in numerous cases serious delay has resulted. Local quarries have become fewer in number, and the average output much reduced. Bricklayers' wages remain the same as in 1896, namely 9d. per hour. The bricklayers' labourers have recently received an advance of a farthing per hour, in accordance with the promise made by the employers last year. The standard wage is now 9½d. per hour. The joiners have given six months' notice, to expire in May, for an advance from 8d. to 8½d. per hour, and a demand has also been made by the stonemasons for an advance from 8½d. to 9d. per hour. Plasterers are receiving from 9d. to 10d. per hour, and labourers 7d. There have been no strikes during the year, but minor differences as to working regulations seem to be a frequent source of complaint. The Corporation have shown considerable enterprise by the vigorous way in which they have taken in hand the improvement of many important streets. Great progress has been made during the year; some of the surplus lands have been disposed of, and much more is expected to be done during the next twelve months. The Leeds Estate Company are making rapid progress with the development of their sites in Briggate and Vicar-lane, and the present general favourable circumstances would seem to indicate a large and busy trade for the builders of Leeds in this year.—*Yorkshire Post.*

BUILDING IN MANCHESTER.—There has been a large amount of building in and around Manchester during the past year. Warehouses and shops to take the place of former structures of the kind which have been pulled down have been erected in con-

siderable numbers, and the tendency to employ iron wherever possible, and, to a certain extent, glass, has made further progress. The building of cottage property on a large scale has continued. There is a growing tendency towards specialism observable in the letting and accepting of contracts, it being often customary to give one firm the brickwork only, another the carpentering, and a third the decorative work.

BUILDING TRADE, NEWCASTLE.—The past year has been one of average activity in the building work carried forward in Newcastle, and of the enterprises that have engaged the occupation of architects and the building trade not the least important have been those concerned with places of worship, and the erection of business premises on the site of chapels deserted owing to the migration of population to neighbourhoods more distant from the centre of the city. Thus, on the land that served so long as the site for the John Knox Presbyterian Church, a large hotel and suites of offices have been built; the Clayton-street Congregational Church has given place to the warehouses and offices of Messrs. John Graham & Company; and a somewhat similar transfiguration is being carried into effect in New Bridge-street, where the Trinity Presbyterian Church stood. New schools continue to be built in the residential parts of Newcastle. Institutions, charitable and medical, find work for architects and builders, and there is the prospect of a commencement with the new infirmary to build and equip which Mr. John Hall made his offer of 100,000. Upon the Quay-side the Exchange on the Sandhill is to undergo structural reformation, and a new Exchange will ere long be proceeded with in and about the site of the Three Indian Kings.

BUILDING TRADE, NOTTINGHAM.—Building operations in Nottingham have been brisk during 1897, and the number of plans passed relating to new erections has been 2,060. During the year 733 new houses, including some shops, have been certified for habitation. New streets are about to be opened out at Sneinton, the plans having been recently passed. Plans have lately been received for similar developments at Leaton and at Bulwell, near to the Forest. Building operations are very brisk in the Meadows, 175 cottage houses being erected by the Great Central Railway Company, and a similar number by the Great Northern.

BUILDING IN SHEFFIELD.—In no previous year have the local builders been busier in Sheffield than in 1897, and in no corresponding period of any recent year have men—labourers, masons, bricklayers, and joiners—been scarcer than at present. In every part of the suburbs dozens of new houses have made their appearance, and in the centre of the city, too, several new and extensive premises have been erected. No less than 1,426 houses have been passed during the past year by the authorities as safe for persons to reside in. The district in which, of late, most of the new houses have been erected is, perhaps, Abbeydale. Meersbrook, though not coming within the city boundaries, has greatly increased in size of late, and what were open spaces and playgrounds for children a few years ago are now covered with houses. After these two districts come Firvale, Stanforth-road, Darnall, and Hunter's Bar. Round about the neighbourhood of the latter the builders have been extremely busy lately, and their operations extend as far as Banner Cross in one direction, and almost to Knamoor in another. On the town side of Hunter's Bar house property is rapidly making its appearance at Stalker Lees, below the Cemetery—ground which until recently was occupied by cottage gardeners—and on one portion of this land a new Board School is being erected. The increase of house property at Crookes, Walkley, and Hillsborough has only been normal during the past year, but in regard to the two first-named districts it is anticipated that when the tramway system is extended new property will spring up very quickly. The completion of the widening of High-street has resulted in the erection of large business premises on the new street line. The School Board have completed one or two Board schools, and the Guardians have opened a block of cottage homes. The great scheme of the city for the coming year is the demolition of what is known as the "condemned area," situate in the centre of the city. The Corporation will remove the houses and rebuild the new streets a number of cottage houses. The wages of the joiners, bricklayers, masons, and labourers have undergone no change during the year, the present rate being—Labourers 6d. per hour, masons 9d., bricklayers 9d., joiners 5½d.

NEW CONSTITUTIONAL CLUB, HALIFAX.—A new Constitutional club, which has been erected at Ovenden, Halifax, was opened recently. The premises have been built from designs by Mr. J. F. Walsh, architect, Halifax, at a cost of about 2,500.

NEW ROYAL INFIRMARY BUILDINGS, GLASGOW.—The arrangements for the reconstruction of the Royal Infirmary, as proposed by the Glasgow Corporation, in commemoration of the sixtieth year of the reign of her Majesty, are being gradually matured. A block plan has been prepared by Mr. James Thomson, architect, which proceeds on the idea that the new infirmary shall be constructed on the pavilion principle. The several blocks run from east to west on the site, and they are connected from north to south by a covered way. For the kitchens, engine-house, &c., accommodation will be

found at the eastern boundary, which is on a lower level than the portion of the site towards Castle street; and on this portion of the ground space will also be found for an additional ward for special cases. The plans have received the sanction of the committee of the subscribers, and they will be submitted to the Directors of the Infirmary for their approval.—*Glasgow Herald.*

LODGINGS FOR THE JUDGES OF THE MANCHESTER ASSIZE.—The Hollies, a family residence in Vine-street, Kersal, the future lodgings for the judges attending the Manchester Assizes, is being altered and improved from the designs of Mr. J. D. Harker, architect, of Manchester.

COMMEMORATION HALL, ROLLESTON, STAFFORDSHIRE.—A village hall has just been erected at Rolleston, in the Burton-road. It consists of a hall capable of seating 250 persons, a billiard and games room fitted, and a reading-room and library. The hall is provided with a stage. The architect was Mr. A. Eaton, of Derby, and the contractor Mr. Kershaw, of Burton.

SANITARY AND ENGINEERING NEWS.

SEWERAGE OF ETON.—The Urban District Council of Eton have instructed Mr. E. Bailey Denton to prepare plans for the erection of a new pumping station and pumping machinery, &c., together with an 18 in. cast-iron outfall sewer and cast-iron cylinder screening tanks; and are about to apply to the Local Government Board for the necessary loan. The new works will be situated at a distance from the town, alongside the Great Western Railway; and by the selection of this site the present outfall sewer and pumping station will be removed from the vicinity of the College playing fields. This removal, it is considered by Etonians, will be a great advantage to the College.

BISHOP AUCKLAND WATER SUPPLY.—The Bishop Auckland Urban District Council have instructed Mr. D. Balfour, M.Inst.C.E., Newcastle-on-Tyne, to report on the new filter beds, at the water works, for the supply of the town of Bishop Auckland.

SEWERAGE OF MINSTER, KENT.—The Isle of Thanet Rural District Council have instructed Messrs. Bailey Denton, Son, & Lawford, to prepare plans for the sewerage of Minster. This straggling village, where the workhouse of the Union is situated, has long been in want of efficient sewerage.

ELECTRIC LIGHTING NEWS.

CARLISLE.—Colonel Durnford recently held an inquiry at the Town Hall, on behalf of the Local Government Board, into an application by the Carlisle Corporation to borrow 30,000l. for electric lighting purposes, and 2,500l. for the provision of dwellings for persons of the labouring class who may be displaced from houses by improvements in Bridge-street, John-street, and Caldew-terrace. Professor Kennedy explained the details of the electric lighting scheme. He said the Corporation would only fix up arc lamps and would take the mains as far as private consumers' doors, leaving private consumers to fix incandescent lamps. It was anticipated that nearly all the hotels, factories, public buildings, the markets, &c., would be lighted with the new light. Mr. Marks, City Surveyor, next explained the plans of the buildings to be erected for the electric lighting station in Jane-street. The total amount of the contracts, &c., amounted to 26,351l., leaving a balance of 3,649l. for extensions, contingencies, road work, &c. The Inspector, having finished the inquiry, went to view the respective sites.

STAINED GLASS AND DECORATION.

WINDOW, CHURCH OF ST. JOHN THE BAPTIST, KINGSTONE VALE, POTNOR.—A two-light window has been placed in this church to the memory of Alice Kirby, of Kingstone Hill. The design was by Mr. H. A. Hyman, Chelsea, who has carried out the work.

CHANCEL WINDOWS, ST. ANNE'S CHURCH, NEWCASTLE.—Messrs. Wailes & Strang, of Newcastle, have recently filled with stained glass the three chancel windows of St. Anne's Church, Newcastle. They are intended as a Jubilee Memorial of the Queen's reign.

MEMORIAL WINDOW, ANDROSSAN NEW PARISH CHURCH.—A memorial window has been introduced in the new parish church, Androssan. The subject is "The Good Shepherd." The window is the work of Messrs. Wm. Melkie & Sons, Glasgow.

WINDOW, NETTLEHAM CHURCH, LINCOLNSHIRE.—A double-lighted memorial stained glass window has been placed in the north aisle of this church. The window is the gift of Mrs. Hodgson Fowler, of Durham, and has been carried out by Messrs. W. & C. Powell, of London and Lincoln. The subject of the first light is William of Wykeham, holding in his left hand a crozier, and in his right a book. The subject of the second light is William Waynflete. The bishop holds in his left hand a view of Magdalen College, Oxford, as seen from the bridge, with a crozier leaning on his shoulder.

FOREIGN.

FRANCE.—The Minister of Public Instruction has just inaugurated the trophy at the new Sorbonne, a great apartment 120 metres in length, on the first story of the building facing Rue Saint Jacques. It is decorated with an allegorical ceiling by M. Guillaume Dubufe. The jury appointed to judge the competition for the *Prix de Reconnaissance des Architectes Français* has awarded this prize to M. Jausse, pupil of MM. Daubet and Esque. The design was for an American embarkment depot.

The sixth exhibition of lady artists is now on view at the Georges Petit Gallery, in the Rue de Sèze. It will remain open till January 22.—M. Fremiet has just finished the model for the monument of Jules Simon, which is to be erected in the State gallery of the Senate at the Luxembourg.—The "Conseil Général de la Seine" has just awarded a prize for the competition opened by the Union Syndicate des Architectes, for the object of building fireproof buildings, and of making existing buildings fireproof.—The Municipal Administration intends shortly to cut out of the large reservoir, which extends along the Boulevard de Batignolles near the Rue de Constantinople, and to replace it by revenue buildings.—The new Mairie at Levallois-Perret, built by M. Jamain, architect, is shortly to be inaugurated. This fine building, which is in the Louis XIV. style, is surrounded by a large square. The expense of erecting it has amounted to about two millions of francs.—The old mill of La Reine Blanche at Poissy is shortly to be destroyed; it is the last of the old buildings erected in the middle ages on the old bridge of the town, and which, like the old Pont Neuf at Paris, formed quite a street.—M. F. Genay, architect, of Nancy, has been elected for 1898, President of the Société des Architectes de l'Est de la France.

The jury on the competition opened by the Municipality of Bordeaux, for the erection of a monumental fountain on the place Larrieu, have awarded the first prize to MM. Verlet, Barbot, and Bauhaïn; the second, to MM. Bate and Seguin; the third prize to M. Raval Larche. The designs of MM. Thy, Rispal, Morin, Goustaux, and Desbois have been mentioned.—The painter Charles Boivin has just organised an interesting exhibition at Tunis, consisting of the pictures he has painted during his excursion in the South of Tunis.—The death of M. Charles Lafforgue is announced, at the age of sixty. He was a member of the Société Centrale des Architectes. M. Lafforgue was a pupil at the École des Beaux Arts, and afterwards inspector of all the large works in the Louvre and Tuileries. He belongs to the school of the "Fouilles." He became later on one of the most active subscribers in the public work, the "Topographie of Old Paris." Some important buildings are also his, notably the house which makes the angle of the Quay Voltaire and the Rue du Bac.

NEW YORK.—The third exhibition of the National Sculpture Society of the United States will be held in the galleries of the building of the American Fine Arts Society, 215, West Fifty-seventh-street, New York, beginning April 30, 1898, and will be open for two weeks. The scope of the exhibition will include works of sculpture, examples of applied sculpture, and architecture in stone, bronze, silver and metal work, and photographs of sculpture in America. The designs submitted in the competition for a design for a sun-dial, instituted by Mr. T. Kelly, of New York, in which a very wide interest has been manifested, will form one of the notable features of the exhibition. Exhibits will be received on April 25 and 26. All further information can be obtained from the secretary of the Society, Mr. Barr Ferree, 112, Wall-street, New York.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. G. Maxwell Lawford, of 13, Victoria-street, Westminster, has entered into partnership with Mr. E. Bailey Denton, and they will in future carry on practice under the name of Messrs. E. Bailey Denton, Son, & Lawford, Civil Engineers, at Palace-chambers, 9, Bridge-street, Westminster, S.W.—Messrs. William Eve & Son, architects, of 10, Union-court, London, have taken into partnership Mr. Frank Norman Eve (the youngest son of the senior partner) and the title of the firm will in future be William Eve & Sons.—We regret to announce the death of Mr. Brighten Binyon, of Ipswich, who has been compelled to relinquish his practice on account of ill-health. He has transferred his practice, as from December 1, 1897, to his former assistant, Mr. George H. Burgess, who will carry it on at the same address, Prince-street, Chamber, Ipswich.—Messrs. Edgar Keeling, Teale, & Co., art metal workers, &c., have removed from their former address in Gray's Inn-road to "Ravenscourt Art Metal Works," Ravenscourt-square, W.—Messrs. E. E. Pither & Co., of 38, Mortimer-street, have purchased the patent right, stock-in-trade, and all patterns of the Stockport Fire Company, and are now transferring that business from 100, Shaftesbury-

venue to the "Radiant Stove" Depot, at 36, Mortimer-street, W.

LAND TRANSFER ACTS, 1875 AND 1897.—In the *London Gazette* of December 28 are published, "as urgent," a set of Provisional Rules, together with a schedule of nineteen forms of notices, inhibitions, instruments of transfer, &c. The new rules came into force on January 1 current, and in all cases of discrepancy will prevail over the Land Registry Rules of 1875 and 1880. The Land Transfer Act passed last session came into operation with the beginning of this year.

MUSWELL HILL AND PALACE RAILWAY.—The Company have prepared a Bill for making a line from the end of their line near the north-east end of Alexandra Palace to the south end of Edith-road, in Wood Green parish, with three junctions from the new line at Wood Green tunnel, and at Edith-road, to join the up and down lines of the Edith branch of the Great Northern Railway, and the Great Eastern Railway at Palace-gate Station.

LABOUR MARKET IN THE COLONIES.—The January circular of the Emigrants' Information Office (31, Broadway, Westminster) state that in New South Wales there is no demand for more labour, and many workmen at Sydney are unable to find employment. Reports from Melbourne, Biscuit, and other towns and districts in Victoria state that there is no demand for more labour; gold miners, however, have been busy; and in South Australia there has been a remarkable revival in gold-mining during the last year or two: the total yield of gold is still small, but it was nearly four times as large in 1896 as it was in 1895. There is no demand for more mechanics or farm labourers. In Queensland demand for carpenters, bricklayers, and other numerous railway and other works which are now in progress are helping to provide labourers with work. An agricultural college has been recently established under Government at Gatton, where students may learn farming for a small fee, and other steps are being taken to promote agricultural settlement. In Western Australia there is a good demand for carpenters, bricklayers, and other mechanics; a large number of public works are being carried out by the Government, which provide work for artisans, navies, and other labourers. Saw-mill hands have been very busy in the timber districts, and some of the goldfields have been in want of experienced miners. In Tasmania the important saw-milling industry of the Huon district in the south-west of the colony has greatly improved of late, and work has been brisk. A report from the mining town of Zeehan, on the west coast, states: "There is a good demand for country carpenters, and a fair one for blacksmiths; good miners can always get work." In New Zealand, the building and engineering trades have been well employed lately in most of the large centres and smaller country towns; but the supply of local men has been generally sufficient.

THE PLUMBERS' COMPANY.—At the last quarterly meeting of the Worshipful Company of Plumbers the Registration Committee were received by the Master and Wardens at the Guildhall, and were afterwards entertained at dinner under the presidency of Alderman Richard Hind. Present, Mr. Taylor, the representatives of the National Association of Master Plumbers and the United Operative Plumbers' Association of Great Britain and Ireland, were among those present. Mr. Bishop, Past Master of the Company, spoke of registration as distinguishing a skilled calling from a trade one. Mr. W. Timms referred to the old race of plumbers being better trained in workmanship than the present day. Mr. George Taylor expressed the opinion that the leading workmen of the period are equal to their predecessors in point of manual skill and superior in technical knowledge. He urged the development of more practical instruction among the younger members of the craft. The Master of the Company spoke of apprenticeship being essential to the training of the plumber competent to execute sanitary work with safety to the public. Professor Garnett said the plumbers were foremost among those connected with the building trades in recognising the value of technical instruction, and he pointed out that the Technical Education Board had encouraged the establishment of classes for instruction in building. Mr. Vacher instanced the Liverpool Corporation as one among the larger municipal bodies which were alive to the importance of the plumbers' registration system as a branch of public health work.

CORNISH ARCHITECTURE.—Mr. E. Sedding delivered a lecture before the Plymouth Institution on the 23rd ult., on "Ecclesiastical Doorways, chiefly in the twelfth century." In the most primitive habitation of man traces of a doorway might always be found, the lecturer traced the progress of Assyrian, Egyptian, Greek, and Roman designs from the last of which Gothic inspiration was derived. There are no Roman remains in Cornwall. None of the Northern invaders who infested this island after the departure of the Romans left any architectural remains of their occupations, except the Saxons, who were chiefly wood builders, and in consequence little of such work remains. Of their stone structures several examples are scattered throughout England, but none in Cornwall. It was well for art that the Normans remodelled the feeble but characteristic Saxon architecture. They were

born masons, and in England found a splendid field for exercising their genius. Of their work examples are found in Cornwall at St. Germans, Mylor, Looe, St. Cleer, and Cury. They always worked in the stone they were accustomed to—sandstones. No granite work of theirs appears in Cornwall, except it may be an occasional font. No fine first pointed examples appear in Cornwall, but in the succeeding style are some fine though not ornamental doorways in the county. The best are at Lostwithiel and Egloskwyth churches, the latter being clean cut and in fine condition. The lecturer having traced the subsequent growth of architecture, contrasted that in the North of England with architecture in Cornwall, and mentioned that there were only three frescoes in the county, one being at Fowey and another at Lostwithiel, and he concluded by remarking that it would be an excellent thing if some great lay body or society would take up the work of saving historic architecture from ruin and destruction. He had tried to exercise his little influence in that direction. Unless they did their best in Devon and Cornwall in watching the matter there would be left simply mock edifices of the thirteenth, fourteenth, and fifteenth centuries.—*Western Morning News.*

ABERDEEN GRANITE TRADE.—The returns as to the import and export of granite at the port of Aberdeen for the financial year ending September 30 last show a gratifying increase as compared with the preceding twelve months. Of rough foreign granite (chiefly from Norway and Sweden) the total quantity imported was 13,824 tons, or 3,483 tons more than the import in 1896. With regard to the exports, polished granite, the most valuable form in which this stone is sent out, showed an increase of 438 tons, the total quantity exported having been 8,982 tons, as against 8,524 tons last year. The most marked advance, however, is in causeway sets, the exports of which amounted to 31,403 tons, or 9,376 tons more than in 1896, when the total was 22,024. The figures for 1896 showed a decrease of 3,028 tons when compared with the preceding year, and this it was thought, was due to the increased use of wood paving in London, the introduction of foreign sets, and the strike of the local sett-makers. In view of the very substantial increase in this year's exports, it would seem as if the strike had been the main cause of the falling off in 1896, and not the fact of Aberdeen granite sets going out of favour. The quantity of kerb, pavement, and building stones exported shows a decrease of 337 tons, the total having been 4,236 tons as against 4,573 in 1896. Rubble and chips show a still further decrease, the exports this year having totalled 11,217 tons, compared with 16,935 last year, a reduction of 5,718 tons. On granite waste slabs, or adamant, however, there is an increase of 892 tons, the figures being 1,840 tons as against 948 in 1896. The total quantity of granite exported is therefore 57,678 tons, or 4,584 more than last year, when the total was 53,094 tons.—*Aberdeen Journal.*

THE ENGINEERING TRADE.—According to Messrs. Matheson & Grant's half-yearly "Engineering Trades Report," the demand for almost all products of the engineering trades had, by the spring of 1897, taken on a vigorous and extraordinary course, and was more profitable to employers and employed had it not been restricted, and in some important branches entirely neutralised, by the strike of the London workmen for an eight-hours day without diminution of wages, and though the dispute has already had the good result of re-organising many labour-saving appliances, orders of large magnitude have been placed abroad, and the ordinary course has been come to England. Prices in iron and steel have risen slightly during the last half-year, and the low rates for pig-iron and rolled steel have done much to encourage certain branches of engineering. In structural steel work, bridge builders and others are well employed, and prices are better than they have been for the last five years, during which period manufacturers have had to accept remuneration quite insufficient to repay their trouble and outlay, especially when the risks of difficult or dangerous erection have to be borne. In supplying Japan, Australia, and South America the competition of the United States is keener than ever. Mechanical engineers in almost all departments continue busy. Railway equipment, hydraulic and other machinery for engineers and steel makers, electric lighting, electric transmission, and mining plant are among the branches of manufacture which have been most active. Machine tool makers have during the last year been actively engaged, not only in maintaining the engineering plant of the country, but in introducing many new inventions for improving and cheapening production. In Portland cement manufacture the home and export demands now exceed the whole producing power of the London district, at present more than 25,000 tons weekly, and prices are about 25 per cent. higher than in January last.

MASTER BUILDERS AND FEDERATION.—A Hereford telegram states that Mr. Thomas F. Rider, President of the National Association of Master Builders of Great Britain, had the following communication to be read at the first dinner of the Hereford Association:—"The present condition of the relations between capital and labour makes these associations necessary in every town of importance. At present there is comparative peace, and the masters should close up their ranks and prepare for

the inevitable contest. The engineers set a splendid example, and until the employers in the building trade make it equally clear that they intend to be masters over their own business, and whilst recognising trades-unions in their legitimate sphere, will submit to no dictation on the part of those associations in carrying on trade, there will be nothing but this irritating condition of affairs, ruinous to employers and employed alike." Mr. A. Krauss, of Bristol, President of the West of England and South Wales Federation, who was present, said that in reference to the Employers' Liability Act the federation were approaching the architects to have a clause in quantities similar to fire insurance claims. He urged builders never to sign contracts without an arbitration clause. He deplored the engineers' dispute. Trade was leaving the country. Why could not an engineers' union and federation be formed so as to be an instrument of peace and not of war? The Bristol builders had a consolidation rule, so that whenever a difference arose with the men they met in conference, and invariably an amicable settlement was arrived at.—*Daily Chronicle.*

THE TIMBER TRADE IN 1897.—According to Messrs. Foy, Morgan, & Co.'s annual Wood Report, the past year eclipses all records both of import and consumption, but it is doubtful whether in its net results it has proved as profitable to traders as even an average season; while, as compared with the preceding year, 1897 has been distinctly disappointing to importers and dealers alike, owing to the fluctuation of prices in all departments. In regard to Sweden, the Colonies took a fair amount of deal sizes off the market during the early months of the year, and thus relieved the market here of a size which is annually getting more difficult to sell. The universal employment of Australian hardwood for paving still more restricts the use of pine, deal, which is everywhere being displaced by the more durable wood. From St. Petersburg the import was somewhat larger than last year, but, notwithstanding prices were well maintained, and the usual fall in value of 3 by 9 1st red, which takes place about August, was much less marked than for some years. For White Sea deals the demand was always good. Whitewood was very largely sold to the coast, and what came into London went off fairly well. Finnish battens sold well during the summer, and the quantity imported was well within the scope of the demand. Of Canadian pine, more than the market could consume has again found its way to London, which is practically a "dumping ground" for a large quantity of oddments and such goods as are unsaleable on forward contracts. During the summer the inevitable fall in prices was evidently at hand, and as soon as a cargo or two went up to auction, prices fell till oddments of pine were cheaper than spruce. Now that there are so many woods which compete with pine among cabinet-makers, the market is totally unable to assimilate the heavy extra quantities which in former years it could, on an emergency, successfully cope with at a very small reduction in price. The stocks are now ample for the present rate of consumption, and if shippers desire the London market to retain any ability to stand the stress of arrivals during the autumn, they must make up their minds to keep away consignments in the future. In consequence of the heavy extra quantities which in former years it could, on an emergency, successfully cope with at a very small reduction in price. The stocks are now ample for the present rate of consumption, and if shippers desire the London market to retain any ability to stand the stress of arrivals during the autumn, they must make up their minds to keep away consignments in the future. 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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Prizes.	Designs to be delivered.
Dispensary and Residence, Crumlin, Ireland	Antrim Union	not stated	Jan. 13
Police Station	Barrick & Co. (Printed Corp.)	50l. 25s.	Mar. 14

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, Ac. Supplied by.	Tenders to be delivered.
Water Supply Works	Cowbridge (Glenn) R.D.C.	J. Hurley, Esq., 10, Bridge-end-road, Tollymore	Jan. 10
Reservoir (8,000 yards), St. Cytus		Monro	do
Glazed Stoneware Water-cistern Pans and Iron Cisterns	Croydon Union	Union Office, Mayfield, Thornton Heath, Surrey	do
Two Villas, Adelaide Park, Belfast		Jas. J. Lindsay, Architect, 6, Calverley-st., Belfast	do
Cottage, Abertou, N.B.		Road & Witter, Architects	Jan. 11
Quadrant Iron Fencing	Willenden D.C.	O.C. Robson, Public Offices, Dyas-st., Ashurst, N.W.	do
Public Baths, Ac.	Radcliffe (Lancs.) U.D.C.	Engineer, Council's Office, Jenkins & Mar, E.E. 16, Brunel, Aberdeen	do
House, Main of Athurb, Bruckley, Aberdeen		Chas. Palmer, Lyons-st., Market Harborough	do
Croquet Pavilion, Market Harborough, Leics.		W. H. Bingley, Architect, Whitefriars, Hull	do
Congregational Church and School, Prince's-avenue, Hull		J. Y. McElroy, Architect, Cornwall-st., Barrow-in-Furness	do
Laundry Extension, Rose	Barrow-in-Furness Union	Austin & Paley, Architects	do
Farmhouse, Hampson, near Galgate, Leics.	W. G. Welch	J. F. Fuller, Architect, 179, St. Brunswick-st., Dublin	Jan. 13
Enlarging Parish Church, Greatstone, Ireland	Manchester Corp.	O. N. Shaw, Town Hall	do
Gas-iron Pipes (500), Boussea, Fosse, North Parade, Bradford		Walker & Colquhoun, Architects, 27, Beaumont-st., Leeds	do
Additions to Infirmary	Billerica (Essex) U.D.C.	A. T. G. Woods, Architect, Brestwood	do
House, Wellington-street	Deverbury Union	Holman & Fox, Architects, Westgate, Dewsbury	do
Street Works, Chapel-street, Ac.	Cannock (Staffs.) U.D.C.	Barry Charles, Esq., Town Hall, Cannock	do
Building of Destructor Works, Neham-street, Ac.	Leicester Corporation	T. Holloway, Architect, Chilpenham	do
Two Houses and Shop, New-road, Chilpenham		Borough Survey, Town Hall Office, 21, Northumberland-st., Worcester, W.C.	Jan. 14
Paving, Ac. Rutland-street, Dorset	Admiralty Commrs., Kingston (Ireland)	J. Donnelly, Town Clerk, G. Gregory, Esq., 43, Waterbury-hill, Durham	do
Municipal Offices, Ac.	Commissaires	W. G. Smith & Co., Architects, Victoria Buildings, Workington	do
Water Sewer, Sherburn Hill	Leicester U.D.C.	A. J. Long, Architect, Watlington	Jan. 15
Two Villas, Town Road, Workington	M. N. Carlisle	G. F. W. Skipper, Architect, 1, London-st., Norwich	do
Additions to Workhouse	Warminster (Wilts.) Union	J. Thomas, 104, Kings-lane, Bournemouth	Jan. 17
Town Hall, East Dereham, Norfolk	Headborough Trustees	D. J. R. M. McKean, Architect, 21, Colindale, London	do
Schools, Brynawr, North Wales	County Authorities	G. W. Rogers, Silver-st., Spennymore U.D.C.	do
Church Buildings, Turfiff, Aberdeen		Superintendent at School, Witham, Essex	do
Paving, Kerling, Road Making, Ac.	Spennymore U.D.C.	A. Baxton, Esq., 22, South-upside-buildings, W.C.	do
Sanitary and Other Works at School, Witham	St. Mary's, Essex	Reid & Witter, Architects, High-street, Bath	do
Electric Light Wiring and Fittings		Victoria at Westminster	do
Cottages, Malandun, Eglis		K. W. Smith & Co., 11, Broad-st., Bristol	do
Brick and Pipe Sewers	Coveney Corporation	G. H. Tait, C.E., Lowfield-street, Darlington	Jan. 18
Refuse Destructor	Darwen (Lancs.) Corp.	D. G. Goodenall, C.E., Rugby Surveyor, Council's Offices, Bromley, Kent	do
Pipe Sewer, Osball	Stanley (Durham) U.D.C.	G. H. Brown, C.E., Boro-engineer, High-street, Rye	do
House, Ac. at Cemetery, Stone	Darford R.D.C.	A. Tamsden, Varsity Hall, Chislewick U.D.C.	Jan. 19
Road Stone	Rugby U.D.C.	City Engineer, Municipal Buildings, Cardiff	do
Sewering, Levelling, Paving, Ac.	Bromley U.D.C.	H. Treacher, Architect, Queen-street, Cardiff	do
Granite Setts, Ac. (2,000 tons), Rye	St. Helen's (Lancs.) Corporation	Lomas & Lomas, C.E. 19, Grosvenor-chambers, Manchester	do
Additions to school, Uldmore, near Rye	Uldmore Sch. Bd.		do
Paving, Paving Down, Removal of House	Chislewick U.D.C.		do
Works and Stores, Varnoff Bridge Works, Bile Air	Leeds Corporation		do
School, Llanfyll, Caerlawn, Wales	Glam. C.C.		do
Widening Fenced Bridge	Glossop Corp.		do
Sewage Outfall Works			do

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, Ac. Supplied by.	Tenders to be delivered.
Sewers (2 Contracts)	Newmarket U.D.C.	T. W. Metcalf, Surveyor, Town Hall	Jan. 1
*External Iron Staircase and other Fire Appliances	West Ham Union	F. N. Hillier, Offices, Union-st., Leytonstone, E.	do
Waterworks	Narva Town Commrs.	H. H. Bailey, C.E., Narva	Jan. 20
*Sundry Work and Repairs	St. Davion's Union, Surrey	King-st. Chesapeake, E.C.	do
Additions to Business Premises, Huddersfield	B. Brown and Others	J. Kirk & Sons, Architects, Huddersfield	do
Building Work at Infirmary, East Dulwich-grove, S.E.	Guardians of St. Davion's, Surrey	G. D. Stevenson, Architect, 15, King-st. Chesapeake, E.C.	do
Villa, East of Garston station, N.B.		D. Matheson, East of Garston	Jan. 22
School, Flushing, Cornwall		W. Swift, Architect, 23, Lemon-st., Truro	do
Free Church, Lochmaben, N.B.		T. E. Watson, National Bank, Lochmaben	do
*Quarantine and Granite	Beckenham U.D.C.	J. A. Angell, Council's Offices	Jan. 24
*Pipe Riser, Manholes, Ac. Various Work at Sewage Works, Oak-tron Poles, Portland Cement, Coke Besses, Fox Gravel, Slack, Ac.	Hendon U.D.C.	S. B. Grinley, Public Offices, Hendon, N.W.	do
*Additions and Alterations to Asylum, Two Lodges, Coal Road, Ac.	Asylum Com. L.C.C.	The Clerg, 21, Whitehall-place, S.W.	do
*Passenger station, Ac. Highbury	Lancs. & Yorks Ry. Co.	Chief Engr. Hunt's Bank, Manchester	Jan. 3
*Brick Sewer and Other Works	London County Council	Engineer's Department, Architect's Dept., 77, Pall Mall East, S.W.	do
*Block of Dwellings		E. H. Farmer, Town Clerk, G. H. Fisher, C.E. Town Hall, S.W.	do
Lodge, Derby Park	Boyle (Lancs.) Corp.	W. H. Handley, Architect, 10, Whitehall-place, S.W.	do
*Enlargement of Winchester Fuel Office	Comrs. of H. M. Works	Branchford Bailey	do
Basement of Dead Boat Market, New York-street	Leeds Corp.	J. H. Hinde, Esq., Gas Office, Leeds	do
Gasometer, Ac.	Cathcart Gas Co. Ltd.	O. R. Vaughan, Architect, 35, Tottenham-cum, E. Road	Jan. 26
Engineer's House, Mitham	Holborn Union	J. Ladd, 7, Doughty-st. E. Kensington, W.C.	Jan. 27
*Extension of Infirmary	Bromley Union	J. W. Ward, Esq., 123, London-wall, E.C.	Jan. 31
Shelter, East Park	Wolverhampton Corp.	Architect's Department, spring gardens, S.W.	do
*School Buildings	East Ham Sch. Bd.		do
*Refectory House at Tooting Common and Myatt Field	London County Council		do
Painting and Repairs at Blackheath, Dover-st.			do
*School (5 miles), Poynton	do		do
*Earthenware Drains, Lamp Shafts, Ac.	do		do
*Vagant Wablers, Beller House, Altona, United to Wablers, Ac.	do		do
*Infirmary	do		do
*Fittings and Furniture for Public Library	do		do
*New House, Bridge, Sewers, Ac.	do		do
Three Houses, Ramsway-hill, Ramsway, Yorks	do		do
Road Works, Thom-st. Road, Ireland	do		do
Roads and Sewers, Ganton, Cardiff	do		do
Block of Rooms, Pump House Hotel, Llandudno, Wales	do		do
Shops, Ramsway-street, Leeds	do		do
Two Shops and Five Houses, Katharine-street, Belfast	do		do
Thirteen Houses and Shop, Ballymore-street, Belfast	do		do
Alterations, Ac. to Licensed Premises, Lord-street, Belfast	do		do
Re-building Licensed Premises, Old Lodge-road, Belfast	do		do

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Inspector of Roads	Tullington Vestry	20s. rising to 30s. weekly	Jan. 15
*Drumheadman	Public Works Dept. Gwent Coast	250s. rising to 300s. per ann.	Jan. 17
*Two General Borough Engineer's Assistants	Salford Corporation	1200s. per annum	Jan. 30
*Boro Surveyor and Engineer	Stockton-on-Tees Corp.	300s. per ann.	do

Those marked with an asterisk (*) are advertised in this Number. Competitions, pp. —. Contracts, pp. iv, vi, viii, & ix. Public Appointments, pp. xvi, & xix.

ments, however, the character of the market is apt to be changed with far greater rapidity than when the bulk of the mahogany was carried by sailing vessels, as it is not unusual for large quantities of wood to be placed upon the market quite unexpectedly. From Honduras the importations this year have been heavy, amounting to nearly 90 per cent. more than in 1896. The bulk of the wood has come forward during the last few months. In Mexican importations there has been a falling away of something like 20 per cent., as compared with the figures for the previous year, and in Cuban something like 30 per cent. Further supplies are much needed, though it is unlikely that till the end of the insurance month will be forthcoming. From St. Domingo the importations this year have been almost equal to last, and prices have been well maintained. The importations of African mahogany have continued to increase, and the total quantity brought in last year is about three times that of 1896. In Nicaragua there has been an increase of something like 100 per cent. over last year's importations of these square sawn logs, which are imported via Boston. The wood has sold well and is evidently much appreciated by a certain section of the trade.

The importations of cedar to Europe during this year show a falling off of about 10 to 15 per cent. as compared with last. The supply, however, has been more than equal to the demand. Of Greenheart the importations during the past year have been heavy, and have been in excess of the consumption. Of Sequia (Californian redwood), at the beginning of the year, there was a moderate stock in fair demand at good prices. The early arrival of another cargo, however, rendered the stock too large for the demand, which is always somewhat limited. In American hardwoods, black walnut logs of good size, quality, and manufacture are readily sold at good prices, but small or inferior logs are not wanted. In oak, there has been some fall in the value of quartered stock, and present prices are low, with comparatively little inquiry. Whitewood planks have been in fair demand at good prices, but lately values have fallen somewhat owing to excessive importation. In East Indian teak logs, the stock on hand and in course of landing is large, but the Admiralty requirement is of an important character, both as to quantity and sizes, and a brisk demand is confidently expected for shipbuilding

work as soon as the labour difficulties are settled. In teak planks, the stock was reduced to a very small quantity in the first quarter of the year, and was inadequate to meet the demand. Values steadily improved, and at length brought shipments forward on a more liberal scale. The consumption has been very active throughout the year. Of the Australian hardwoods, the importation of Kauri pine has consisted of moderate-sized parcels, and one small cargo now discharging, of which a considerable portion has been sold ex ship. The demand has been active throughout the year, and at times the supply was insufficient to satisfy requirements. The great variety of purposes for which this splendid wood is used increases annually. Jarrah wood for paving has given most satisfactory results, and the present year has witnessed an enormous increase in the demand. For several months the supply was quite inadequate, and this has led to arrangements for developing the trade to a greater extent in the future. The requirements of the provinces are now a very important factor, and the consumption is likely to be very active. There is also a prospect of Jarrah being largely used for railway sleepers.

MEETINGS.

SATURDAY, JANUARY 8.

Royal Institution.—Proceedings at Lecture on "The Principles of the Electric Telegraph."—8 p.m.
Perth Architectural Association.—Visit to New Post Office.

MONDAY, JANUARY 10.

Surveyors' Institution.—Adjourned discussion on Mr. Pundar's paper on "The Royal Commissioner's Suggested Amendments to the Agricultural Holdings Act, 1883."—8 p.m.
British Society of Architects (Carpenters' Hall).—Paper by Mr. W. Baker, 7.30.
Liverpool Architectural Society.—Mr. Beresford Pitt "The Architecture of Michelangelo."—6 p.m.
British Society of Architects.—Mr. H. Dare Bryan on "Decorative."—8 p.m.
Leeds and Yorkshire Architectural Society.—Dinner.

TUESDAY, JANUARY 11.

Institution of Civil Engineers.—Mr. E. W. Anderson "The Machinery used in the Manufacture of Cordite."—p.m.

WEDNESDAY, JANUARY 12.

Architectural Association (Discussion Section).—Mr. H. Hale on "The Symbolism of Ecclesiastical Architecture."

Birmingham Architectural Association.—Mr. P. Macgregor Chalmers on "The Abbeys and Cathedrals of Scotland," with limelight illustrations. 8 p.m.
St. Paul's Ecclesiastical Society.—The Rev. Fr. J. B. Bligh, M.A., on "A Plea for its Retention and Proper Use."—7.30 p.m.

THURSDAY, JANUARY 13.

Society of Antiquaries.—Ballot for the Election of Fellows. 8.30 p.m.
Institution of Electrical Engineers.—(1) Presentation of reports, (2) inaugural Address of the President, Mr. Joseph W. Swan, F.R.S. 8 p.m.

FRIDAY, JANUARY 14.

Architectural Association.—Mr. F. T. Baggallay on "Composition in regard to Public Buildings."—7.30 p.m.
Royal Institution.—Proceedings at Lecture (Mr. G. Gordon Mackay on "Mechanical Drawing."—8 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to application until February 15.

1,896, 2,844.—KEY FOR MITHRE AND OTHER JOINTS:—*See Patent.*—On the key surface are ribs, the key fits into the driving end, thus engaging and drawing together the materials to be joined.

1,873.—FLOOR-COVERING MATERIAL:—*O. Schmidt.*—The inventor substitutes finely-divided mica for the customary cork-powder or wood-floor.

2,526.—RAISING, LOWERING, AND HOLDING WINDOW SHUTTERS:—*T. Crooke and J. T. Nichols.*—The device, especially applicable to carriage doors, consisting of a manual jointed or angle lever, with a balance weight working on a chain over a pulley, operating in the weight of the sash or shutter.

6,577.—RIDGE AND BEVEL:—*See Patent.*—The ridge of a flat underside, or groove or cavity, for the mortar on the wall-top, the coping has on its underside a set of depending parallel ribs or flanges, between the ribs or recesses, to receive the wall-top.

1,807, 743.—LAVATORY BASINS:—*G. Chisholm, Junr.*—The basin has a well beneath its outlet, and a syphon-pipe entering its base, and covered with a bell or dome cover, the pipe extending into a bend or trap; a handle raises the lid or dome.

1,887.—SOCIÉTÉ MÉTALLURGIQUE DE CHAMPIGNOUILLES:—*See Patent.*—Lime is mixed with granulated sludge, and the mortar when set is baked in pieces; it is claimed that this material, when finely ground, gives a rapidly-setting cement with high resistance, analogous to that of Portland cement containing less than 15 per cent. of oxide of iron.

1,943.—TAPE MEASURES:—*F. W. Galley.*—A woven tape measure or measuring band, with metal strips in the warp which are wired in the weft, the warp being covered or isolated; may be used in water, even at boiling heat.

3,263.—HOSPITAL SINK OR WASHING AND SLOP CLOSET:—*Shanks.*—A vessel (resembling a pedestal water-closet), having a syphon or trap beneath its discharge combined with a bracket, or carrier, that can be turned aside, and adapted to receive a bed-pan or urine-bottle; a jet nozzle or rose, or water, is fixed to the bracket.

5,575.—A LINING BRICK FOR SWIMMING-BATHS, &c.:—*See Patent.*—The sides and ends of the glazed-face brick are furnished with channels extending around the brick between ridges or flanges.

1,877.—RIDGE AND OTHER TILES:—*S. Buck.*—The tiles are made with an inter-locking ridge and groove on the tiles taken together.

10,595.—FITTING PIPES, CHANNELS, GUTTERS, &c.:—*A. Greenwood.*—These are fashioned with a longitudinal casting rib along their external surface.

12,731.—PUMP WATER-CLOSETS:—*G. B. Hewell.*—A bowl, provided with a re-fill chamber, is combined with a re-fill chamber and to the bowl for flushing; the contrivance is more particularly adapted for marine purposes.

12,856.—SASH HOLDER AND FASTENER:—*C. Roberts.*—A rack fitted with a spring operates against another rack which has two wedges working with similar wedges on a sliding rod; a lever, fulcrumed on the window frame, is provided that the portion of the rod of gravity of the whole arrangement falls below the suspension point, by which means the level is set before operation is taken.

12,876.—ROOF TILES:—*G. E. Evans.*—The tiles are made by placing strips of clay between the pressing wedges, which latter at the same time form ribs on the tiles and leave them hollowed.

NEW APPLICATIONS.

For ending December 25.

20,051, Ward & Toms, Street or Rallall Drains or Gutters. 30,957, Dudley, Connexions of Iron Steel, and

other Structures. 30,974, Tyerman, Sash Fasteners; also 30,110, Nicholson; 30,126, Unett; and 30,120, Slater. 30,994, Chienanders, Gas Leakage Meters for Buildings. 30,999, Gieseler, Slides. 30,127, Hill, Combined Sash Lifts. 30,128, Locks. 30,131, Porter, Windows and Fasteners. 30,132, Lowering Apparatus therefor. 30,143, Henneke, Joists, Girders, &c., of Cement Strengthened with Iron, &c.; and 30,144, Flooring of Strengthened Beton or Concrete. 30,145, Adams, Latches and Fastening Devices. 30,150, Mann, Stone-Planing Machines. 30,154, Flint, a Revolving Window. 30,166, Foxall & Pearce, Spanners and Wrenches. 30,167, Watson, Sliding Window Sashes, Casements, and the like. 30,168, Reid, Portable Polishing Booths for Electing. 30,177, Althoff, Bolts for Doors, Cupboards, Cellar-Flaps, Shutters, &c. 30,193, Shrivens, Venetian Blinds. 30,207, François, Flushing tanks. 30,214, Vögel, Artificial Stone. 30,223, Nicholl, Devices for Feeding Clay or other Materials. 30,225, Gowlard, A Sash Fastener. 30,227, Howson, a Ventilating Device. 30,234, Oliver, Window Fastenings. 30,241, Ewing, Joints of Earthenware and other Pipes. 30,250, Koenemann, Vices with Adjustable Jaws. 30,259, Dames, Dust-bins and similar Refuse Containers. 30,265, Lesch & Polte, Manufacture of Tiles, &c. 30,268, Browne, Securing Limes to Window Sashes. 30,282, Billington & Newton, Circular Saws (for Metal); also 30,298, Jackson & Sutton. 30,284, Adams, Hot and Cold Taps. 30,285, Cousland, Ventilators. 30,289, Masons, Elevators and Screwing Apparatus. 30,295, Holt, Automatic Locking and Lifting Lever Combination for Lifts, Cranes, or other Machinery. 30,313, Hughes, Apparatus for holding open Doors. 30,325, Bartholdi, a Spiral Nail. 30,327, Bayen, Coverings for Walls and Ceilings. 30,331, Nicholl, Devices, Door Locks; also 30,339, Wilkes. 30,339, Rappold, Drying Apparatus for Earthenware Goods, Bricks, &c. 30,344, Willis, Fire-proof Floors. 30,354, Kemp, Automatic Gas Valves. 30,355, Viller, a Door Latch. 30,361, Boyd & Baylis, Fire-proof, Damp-proof, and Heat Non-Conducting Composition. 30,368, McPherson, Sash Fasteners. 30,369, Morrell, Door Locks and Catches. 30,378, Taylor, Attaching Cupboards, Turn Tongues to Spindles. 30,382, Knox, Combined Door Latch and Bolt. 30,383, Ward & Toms, Lavatory, Bath, and other Waste-Pipe Traps. 30,387, Kenyon, Mixing Concrete and the like. 30,389, Lanyon, a Debris Trap. 30,392, Robson, and Flap Ventilators. 30,397, Cotton & S. Todd, Siding on and Reversing Window Sashes and Frames. 30,398, David, a Door Knob and Spindle. 30,404, Barker, Disinfecting and Deodorizing Water and Deposits. 30,414, Gill, a Combined Ridge Tile and Stove or Chimney Pipe. 30,417, Brewer, Tape Measures. 30,453, Sanders, Soldering Irons. 30,455, Shuttleworths, an Automatic Window Fastener. 30,456, Harrison, Ornamental Plain Plates with Inlaid Figures or Scraps. 30,472, Thorburn, a Chimney Can or Ventilator. 30,477, Green & Wragge, Sanitary Pipe Traps with Curved Arms. 30,482, Tomlinson & Phillips, a Double Rebaud Weather-proof Joint for Reversible Windows. 30,483, Sowerbutts, an Improvement applicable to Windows, Doors, and the like, which Turn on Pivots or Hinges. 30,490, Brown, Multiple Fly Vener. 30,511, Conchani & Hope, Window Blind Rollers. 30,513, Jones, Vices. 30,531, Harrison, Chucks for Lathes and other Machine Tools. 30,535, Taylor, Circular Spirit Levels.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 22.—By W. Daw & Son (at Denbigh).

Tremerech, Flint.—Rhuall Post Office and o.a. 1 r. 2 p. u.t. 30 yrs. 8 r. 1 f. £100
2 r. 2 p. u.t. 30 yrs. 8 r. 1 f. 700
"Groesford House and 2 a. 1 r. 2 p. f. 700
Cwm, &c., Flint.—Enclosures of land, 14 a. 3 r. 2 p. f. 435
Concessions made in these. 1 g.r. for freehold ground-rent; 1 g.r. for leasehold ground-rent; 1 g.r. for improved ground-rent; 1 g.r. for ground-rent; 1 r. for rent; 1 f. for freehold; 1 f. for copyhold; 1 f. for leasehold; e.r. for estimated rental; u.t. for unimproved term; p.a. for per annum; y.s. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS

TIMBER.
Greenheart, B.C. 8/6 to 10/6
Teak, E.I. 10/6 to 15/6
Sesuvia, U.S. f.c. 1/8
Ash, Canada, load 2/5 to 4/6
Birch, do. 4/6 to 6/6
Fir, Danube, do. 4/6 to 5/6
Oak, do. 8/6 to 9/6
Canada, do. 4/6 to 6/6
Pine, Canada red 4/6 to 6/6
Do, yellow 2/6 to 4/6
Lath, Danish, 1/2 2/6 to 3/6
S. Petersburg, 5/6 to 8/6
Walnut, Flga. 2/6 to 3/6
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Particulars on Application. Chief Offices: Fitzroy Works, EUSTON ROAD, LONDON, N.W.

The Builder.

VOL. LXXIV. NO. 2898.

JAN. 15, 1898.

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Plans	Two Single-Page Photo-Lithos.
Royal Academy Silver Medal Drawings: The Library, Lambeth Palace.—By Mr. A. M. Watson	Single-Page Ink-Photo.
The "Coronet" Theatre, Notting Hill.—Mr. W. G. R. Sprague, architect	Single-Page Ink-Photo.
The Hedgehog Inn, Canal-street, Nottingham.—Messrs. Brewin & Baily, architects	Single-Page Ink-Photo.
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The Inquest on the Cripplegate Fire.



THE coroner's jury have returned a verdict that the great fire which recently devastated a large area in Cripplegate "was wilfully caused, by some person or persons unknown."

The verdict seems to have been partly arrived at by a process of exclusion of other causes; it was not from spontaneous combustion, it was not from an explosion of gas, there being, in the view of the jury, no evidence to support either conclusion; and after this, the verdict that it was "not accidental" of course almost inevitably follows. Probably the jury had some opinion in their own minds as to who was really responsible for the act, but evidence to fix it on any special person was wanting.

It is not so much our province to comment on the moral aspect of the action suggested by the verdict. No doubt the consequences of the fire went far beyond those contemplated by the incendiary. The point to be considered here is, how it came to pass that so extensive and serious a fire should have so quickly developed from a small beginning; that it should have been so easy for one unprincipled person to set a whole district in a blaze. It should be observed in the first place, that although the City Coroner had the power to order an inquest to be held as to the cause of the fire, the London County Council, had the conflagration occurred outside the City bounds, would not have had power to order a similar investigation, and we should hence bear in mind that at least in some of its institutions the Corporation is ahead of the younger body. Unfortunately, however, a Guildhall inquiry can hardly be considered the most satisfactory manner of dealing with a subject of this description; nor were its methods in this case of the practical character essential to technical work. To begin with, the Coroner, whose services are primarily associated with the City Mortuary, could not be expected to have an intimate knowledge of building construction or fires. His physical infirmities

too, unfortunately, were one of the reasons, we understand, for his interrogations being delegated to the City Solicitor, who, for all practical purposes, took the direction of the Inquiry in his stead. This official's work is also but seldom associated with technical matters. The jury, with one or two notable exceptions, also took a very lay view of the subject, and the queries of its members were limited to questions of detail, as distinct from principle. Then came the tedious form of procedure, made particularly tiresome by the taking of longhand notes, the reading of depositions, &c. The proceedings were actually spread over fourteen days, though in reality seven would have sufficed to put the questions. These questions, too, with endless repetitions, often so meaningless, were frequently of anything but a practical nature, and hours and hours could have been saved by a strong Chairman.

Then comes the question of the selection of witnesses. This was very difficult to understand. Considering, for instance, the criticisms made regarding the Fire Brigade, why were there no witnesses from outside that body, with the exception of an ex-officer of quite a subordinate rank? Considering the question of building construction, how was it that, besides the necessary attendance of the District Surveyor to the area affected, the surveyor of the ground landlord, and the architect to some of the buildings, only one outside architect was called, and this gentleman's name has certainly never been associated with fire protection, nor is it even well known to the general professional world? We believe the policy was to only call the official witnesses and those who had been actually present, but even this policy was not rigorously observed. But perhaps there was no policy after all.

Then as to the nature of the evidence, the powers under which the Inquiry was held distinctly defined that the investigation embraced the cause and circumstances of the fire, all matters connected therewith, and also the means of preventing similar fires in future. The principal evidence that was taken, however, referred solely to the cause, and some details in respect to the working of the Brigade. Such a detail as a supply of coal for the steam fire-engines occupied quite a day and a half, which, we believe, is more time than was given either to the general handling of the Brigade, or such

questions of vital importance as the construction of buildings in our warehouse districts. As to the cause of the fire, this is really of subordinate interest as far as fire protection generally is concerned, for that fires will occur either by accident or by incendiarism are well-known facts, which serve as a basis on which we have to deal with the protection of the Metropolis. The question is whether, given an outbreak of fire, we can prevent it spreading by improved forms of construction and an efficient Fire Brigade. Now, as to the Inquiry into the efficiency of the Fire Brigade, the spirit with which the investigation was met by those responsible can be best illustrated, firstly, by Colonel Rotton's statement that he considers we have the best Fire Brigade in the world; and, secondly, by a very typical sentence of Commander Wells, which practically reads as follows:—"I would like it to be distinctly understood that I am the responsible expert of the people of London, whom I serve, and that outside opinions considerably interfere with me and the Fire Brigade." Now, we understand from Colonel Rotton's evidence, that he does not profess to be a fire expert, and that his experience as Chairman of the Fire Brigade Committee is under one year. Commander Wells' experience, we believe, is under two years. Their two statements should be borne in mind by the ratepayer. He has to assume that we have the best Brigade in the world, and that criticism is inconvenient to its chief.

To turn to the evidence of the architects and surveyors who figured at this Inquiry, we have, to commence with, some very interesting statements by Mr. Vickery, the architect of some of the warehouses destroyed. For instance, he tells the jury that it is almost impossible to make a building fire-resisting if we put combustible goods into it and stack them in a manner which is common with warehouse property. In other words, he seems to think that it is useless to attempt improved construction. Another statement by Mr. Vickery is that the Cripplegate buildings were "reasonably fireproof." This is quite an instructive definition of the structures in question, remembering that the evidence show that they were cut up by well-holes, that there was not a single protected column on the site, that all the floors and staircases were of wood, that

match-boarding was used almost throughout, and further, that the partitions were of the lightest description. Is this "reasonably fire-proof"?

Fortunately these opinions were set off by Mr. Woodthorpe, who condemned the class of buildings on the Cripplegate area, but seemed to consider that he had no powers whatever to prevent a repetition of buildings of the same class. Mr. Woodthorpe would have been able to give some excellent evidence, but there seemed to be a great dread of getting anything like a practical or expert opinion from a competent man. Nevertheless, Mr. Woodthorpe's statements must have shown that he favoured modern methods of fire-resisting construction, and desired to enclose all staircases, with a view of affording a ready means of escape in case of need. A small detail, too, which came out in Mr. Woodthorpe's evidence, was to the effect that he preferred wood doors with iron coverings to the plain iron door, which, though advocated by the insurance companies, affords but little protection in a hot fire. The jury certainly missed much valuable information by the cutting down of Mr. Woodthorpe's evidence.

Next, Mr. Penfold, the Surveyor to the Goldsmiths' Company, gave some interesting evidence regarding the history of the site, and the Corporation certainly do not seem to have been alive to the great improvements which could have been effected in this district in the early seventies, when many of the buildings were practically rebuilt and the roads relaid. Mr. Penfold, by-the-by, seemed to consider the thoroughfares on his estate rather above the average in respect to width and traffic facilities. This is instructive reading, considering that most of the roads have a width of about 25 ft. But Mr. Penfold also indicated that better rents went hand in hand with an increase of width to a thoroughfare, owing, no doubt, to the better lighting and traffic facilities which would be afforded. This Company has also since then declared itself ready to help in any scheme of improvement. This is another point worth noting.

Last came the evidence of Mr. J. H. Smith, who, we believe, figured in Court as an expert, though we have certainly not heard of him in this rôle before. This is the gentleman who tells us that we should have double sashes in order to prevent the spread of fire through windows, but seems to have forgotten that on the Continent, where double casements are everywhere used, fire spreads just as readily as through our ordinary windows. His statements included one that all external walls should have "a hollow space continued round the inside from top to bottom," whatever that may be. Then, we understood him to desire some "sprinkler arrangement fixed at the top of these hollow spaces, with an automatic attachment," whatever that may mean. This improvement certainly puzzled the jury and the City Solicitor, and we are afraid it puzzles us. The embryo expert seldom seems to realise that we have to reckon with practical forms of construction, and do not wish to complicate our buildings unnecessarily with a view of obtaining better fire protection. Whatever the device is, the jury entered into an argument with Mr. Smith as to what the extra cost of it would be. It seems that Mr. Woodthorpe had left the impression that the

cost of making a building fire-resisting would increase the total expenditure by 50 per cent. Mr. Smith thought he would be able to do it at 25 per cent. Most experts, by-the-by, seem to say that 10 per cent. ought to cover everything practical; some makers of fire-resisting floors, &c., say 5 per cent.

To summarise: we have the District Surveyor's opinion that the buildings were dangerous, but that he has no power to prevent similar structures being put up; we have the freeholder's surveyor, who recognises the advantages of better planning and construction on his estate; we have the opinion of the architect of some of the buildings, who considers the buildings were "reasonably fire-proof," and, lastly, we have the "expert" who brings forward his own pet suggestions and fads. Is this the extent to which the evidence should have gone in an inquiry that ought to have ranked as one of the foremost for the future development of fire protection in the Metropolis? We are afraid not. There is little doubt that the City Solicitor and the jury fought shy of expert evidence, and perhaps they were not wrong, if the kind of expert evidence which we were to have was to be of the type given by Mr. Vickery and Mr. Smith respectively. Why were not some of the authorities on our Building Act consulted? Or men who have spent more or less of their lives in dealing with fire hazards? The expression of opinion by, say, six competent architects and surveyors, besides the District Surveyor and the freeholder's surveyor, need not have occupied more than a day, and would have given us a basis to start our reforms on.

Next to the evidence given above we should perhaps call attention to some statements by the representative of an insurance company. It has long been the complaint of architects that in wishing to introduce better forms of construction, clients generally point out that they cannot get a substantial abatement of premium to cover any extra capital expenditure on their buildings. Now this representative of the insurance company states that the merits of fire-resisting construction are recognised when the premiums are fixed. But we doubt if the recognition is substantial. Figures, unfortunately, did not come out in the evidence: they would have been highly instructive. Our impression has always been that the insurance companies are averse to improved methods of building, as they prefer doing business where premiums are high, though they may stand to lose considerably. It would certainly be of great advantage to architects if the Fire Offices Committee were to let them have some official statement as to the rebate for better classes of construction. There would then be more encouragement to persuade the client to incur an extra expenditure. As to the technical detail of this witness's evidence, we may notice that he favoured the arrangement of steel or wooden shutters to windows facing well-holes, and that he stated that the insurance companies would favourably consider a reduction of premiums, if such shutters were put up.

Another witness whose statements were of practical significance was the Engineer of the New River Company. We heard from him that we only have about 35 lbs. pressure in the mains in the Cripplegate district. We

next heard that we get our water, according to his ideas, gratis on the occasion of fires; but surely we have to pay for it indirectly in our water rates. Next we heard that the Aldersgate-street main measures 21 in., whilst the Jewin-street main is only a 7-in. one, and Hamswell-street 4-in. Surely 4 in. and 7 in. are very small with a 35 lb. pressure in a district of this description. Wells-street and Shaftesbury-place also only have mains of 4-in. diameter, and they are so-called dead-ends. Of course, the Company used to lay 3-in. mains, and a point was made of this in the evidence. But surely we do not wish to be satisfied with comparative improvements; we must have mains which fulfil modern requirements.

Turning now to Fire Brigade evidence, we think we should point out that every care was apparently taken by those in authority at this inquiry not to ask any questions which would be inconvenient to the Force, and that the little evidence of value that was obtainable was due to the jury, excepting, perhaps, as to the matter of coals. The initial stages of the fire were alone dealt with, and, in spite of the fourteen days' inquiry, we have not yet been able to put together a consecutive story as to what the fire actually did. The evidence was mainly formal, describing how the Brigade turned out, who arrived first, and so forth. It was a curious, not to say serious, feature of the inquiry to notice how the City Solicitor broke off his queries directly he seemed likely to get on what might be termed dangerous ground, and the re-examination of Commander Wells, when recalled on the last day, was actually taken up by the Solicitor of the County Council—or, in other words, the solicitor of his employer, which surely cannot have been considered very good policy. Now, no one has ever doubted that the members of the Metropolitan Fire Brigade behaved very gallantly. There was no necessity for the theatrical displays in court on this point. What we wanted to know was if the Brigade is well organised, well managed, adequate, and efficient; and not one of these questions was dealt with in the Inquiry. The matter of the deficiency of coals for the steam fire-engines occupied a day and a half, as we have already said, and, excepting these coals, a few other details, and what we have termed "formal evidence," nothing transpired at the Inquiry that would tend to give the general public confidence in the Fire Brigade. If anything, confidence was shaken by the evidence as to the powers of the Chief Officer and the powers of the Fire Brigade Committee of the County Council. Neither Commander Wells nor Colonel Rotton seemed to know their respective responsibilities, and it was quite amusing to hear how Commander Wells referred the jury to the Committee, and the Chairman of the Committee referred them to the gallant Commander. We were very pleased to hear Colonel Rotton consider Mr. Wells one of the most valuable officers we have ever had, and we were similarly pleased to hear that the Chief Officer was satisfied with his staff. We were also pleased to hear that Commander Wells was satisfied with his Committee, but surely this mutual complimenting was out of place. Should we really some day have a great catastrophe with loss of life, these mutual compliments will not help us in localising responsibility, and indicate the

person or persons who, as the saying goes, would require "hanging." It was really discreditable to see how little the Chairman of the Fire Brigade Committee knew of his Fire Brigade, and how he tried to show that the Chief Officer was really responsible, whether the Force was strong and efficient or not. The manner in which Commander Wells, on the other hand, indicated that all serious matters would be decided by the Committee, tended to show that he could not very well be held responsible for the general organisation of the force. We do not wish to deal with the organisation of the Brigade or its handling, but we should much have liked to hear if we have everything at our disposal necessary to meet a large outbreak, *i.e.*, efficient men and officers, a good system of management, a method of bringing up reinforcements rapidly, a system of so-called tactics, the proper appliances, and many other matters.

We have no doubt that the first engines were turned out punctually, and that reinforcements were promptly supplied after the usual delays which are necessary with the system employed. We have no doubt that after an hour or so the Chief Officer ought fit to get further strong reinforcements, but we should also like to know why there were only 280 men present at this fire, when the staff numbers nearly 1,000. This question was not asked at the Inquiry, though the fact has given rise to considerable comment. We are told by many experts that it is useless to think of a stronger brigade when, somehow or other, only about all the men available are used at a serious fire like this one. There have been charges as to the tactics or, rather, the absence of tactics, the great delays with getting to work with long lines of hose, and many other questions which were curiously avoided at the Guildhall Inquiry. But we do not wish to go into detail. What the Inquiry no doubt has shown us, is that the Fire Brigade is not of a very high standard at the present moment, much less the fire protection of London generally. Even with the best of Building Acts and model buildings from a fireman's point of view, we shall always require a Fire Brigade of great efficiency in the Metropolis. As it is at present, with so many dangerous structures, we have every reason to lay great stress on a well-organised and efficient force.

In addition to the main verdict, the jury made various suggestions, some of which are of considerable value, and are exceedingly creditable to a jury not composed of experts. They expressed the opinion, generally, that the unsatisfactory planning and construction of the buildings involved was one of the reasons of the conflagration developing rapidly. In connexion with the question of construction, the jury considered that the area should be rearranged so as to have greater regard to the safety of adjacent property, and that the match-lining of ceilings and walls should in future be prohibited, all ceilings to be plastered or covered with some fire-resisting material. In regard to the Fire Brigade, the way the questions were put by the coroner necessitated the plain answers that there were sufficient appliances and fire-engines at the fire, a sufficient water supply, and an insufficient coal supply. But with regard to the general handling of the Brigade, the attendance of available fire-

men, &c., nothing could be very well said under these circumstances. What the jury, however, did take upon themselves to say in the form of a rider, was that they were not satisfied that the methods and appliances of the Fire Brigade are such as they should be, and we congratulate the jury on having avoided the usual policy of general complimenting, which is so common on occasions of this kind. In addition to the expression of opinion regarding the methods and appliances of the Brigade, we have their suggestion that fire alarms be fixed on or near every post-box. This matter of post-box alarms is something like ten years old, and the jury's suggestion, which would perhaps take a year or two to carry out, would still have left us about twelve years behind other first-class installations. Next comes the suggestion that the position of the hydrants be uniformly indicated on walls and lamps throughout London; another excellent suggestion which we believe is something like twenty-five or thirty years belated. The uniform indication of hydrants has always been considered one of the first necessities to provide for the smart working of the Fire Brigade, and in many cities books are carried on the engine indicating the position of hydrants of the different districts, so that the fireman arriving would not even have to look for the hydrant when he gets to the fire, for he would know on the road exactly where to find it. Next we have the suggestion that unless we have some arrangement by which large steamers can be rapidly got to work, our system of water mains and hydrants must be improved. We think it wants improvement in dangerous districts, quite independent of the working of the steam fire-engines. A strong high-pressure system is wanted for the City area, and for certain districts in the West End and in the south of London. Gas-cocks outside all premises are suggested. This is perhaps going a little too far, as the danger of gas when alight is much over-rated, and does not materially affect a fire. What we do want are stop-cocks to every street and to every block, so that we need not pull up the roads to cut off the gas supply as was the case at the Cripplegate fire. Another suggestion is that two steamers should be kept at certain City stations. This is certainly a good one, and ought to have been introduced many years ago; but as to keeping one steamer under steam, there are certain practical difficulties. Why not chemical engines for the first attack? Next, a better system for utilising the volumes of water in the mains is suggested. This apparently refers to the construction of tanks where there are dangerous areas. The suggestion is very difficult to comply with, and it is doubtful if money expended on such tanks could not be better expended otherwise. Lastly, we have the proposal that occupiers should give the Fire Brigade facilities to become acquainted with the character of their buildings. In this we are also many years behind Continental and American cities, where the officers of districts have the necessary powers to enter premises from time to time in order to view them, and are also supplied with detailed maps, not unlike the insurance plans which the fire offices have in order to judge the risk of a policy.

We have dealt at more length with the

suggestions regarding the Fire Brigade than we anticipated would be necessary in connexion with the verdict of a jury of laymen. But the proposals have been so business-like that they command attention, and perhaps form one of the most practical results of the long inquiry. But, of course, we must remember that general organisation, general equipment, the handling of men, &c., and, above all, the duties of the Fire Brigade have not been considered.

As to the better construction of buildings, the jury have very wisely limited their recommendations in the manner indicated above. The subject is a very large one, and will require the full consideration, not only of architects and engineers, but of the representatives of the many interests involved. Steps are already being taken in this direction, and before the year is out we should have our principles of fire protection properly defined, and our testing stations properly equipped. At all events, the Cripplegate fire should serve us as an object lesson.

NOTES.

It appears that, while there is some chance at last of the South Kensington Museum new buildings being taken in hand, there is a desire on the part of the Government to spoil them if possible by insisting on their being cut down to a plain structure, on the usual English theory in regard to public buildings, that it is only necessary to have a plain utilitarian structure, and that all expenditure on architectural dignity and beauty is money wasted. The *Times* refers to and of course supports this view in a leading article of Wednesday last; the *Times* being in these matters the true representative of the English indifference to and contempt for architecture. It is doubtful, however, whether the Treasury will succeed in crushing all the architecture out of the proposed building. Mr. Aston Webb is the selected architect, and is entitled to carry out the work, and officialism will probably have some difficulty in cutting his design down to a mere utilitarian level.

Truro Cathedral.

At a meeting of the Truro Cathedral Committee last week it was decided, very properly, that Mr. F. L. Pearson, who has been his father's coadjutor in much of his work for some years, should be appointed as architect to carry out the remaining portions of the Cathedral according to the original design. In regard to the portion of the Cathedral to be next proceeded with, a resolution was carried to the effect that "If it be ultimately decided to continue the Cathedral at the present time, the Committee be authorised to spend all the money collected on the continuation of the works, and that on the completion of the nave, the West Front be regarded as the portion of the Cathedral which is the special memorial to Archbishop Benson." There had been, it will be remembered, some talk of completing at once the central tower as a memorial to Archbishop Benson; but it is far more to the purpose to get the ground plan of the Cathedral complete, and a west front is as good a memorial as a tower. Mr. Frank Pearson having stated that the preparation

of the working drawings and specification for the nave and west front would occupy six to nine months, it was finally decided that on the completion of the drawings a meeting of the Committee should be called to consider the question of tenders.

THE Vestry of Camberwell has taken up formally an idea which has been several times suggested, that it would be a public benefit for the Government to purchase the Crystal Palace and make it a national institution. It is urged that (as every one knows) the Palace is not remunerative as a private enterprise, and that it would be a real loss to the community if it were to be closed and pulled down. In this we quite agree; the Palace has played a great part in the education as well as the amusement of the masses. The Lord Mayor has proposed to call a meeting this year to consider the subject, and the suggestion of the Camberwell Vestry is being circulated among all the municipal authorities in England and Wales. There is one point, however, which seems to have been overlooked in the Camberwell circular, viz.: how long is the building going to last? Glass and iron is not a monumental form of structure, and the building is already, we fancy, costing very largely in annual repairs.

The Freedom of Labour Protection Association. We have received the first report of this Association. This body was only formed in July last, and its incorporation is certainly an important step in the organisation of the forces which are directed against the illegitimate action of trades-unions. The great object of the Association is implied in its name: to protect non-unionist labour; it does not, it would seem, seek to be actively hostile to trades-unions, but it is a part of that counter organisation which the action of trades-unions has in these later years rendered necessary. While we are altogether in sympathy with such an association in its principles, there may be occasions when it may aid employers against reasonable demands on the part of trades-unions. Its action will therefore have to be impartially watched. No one, however, can doubt that when it gets into full working order the Association may be productive of good effects in the industrial relations of capital and labour.

Condition of Public Buildings. In reference to the recent catastrophe in Canada by the collapse of the floor of a public building, Mr. Frank Caws, a well-known Sunderland architect, has addressed a very sensible letter to a local paper, calling attention to the question of the responsibility which ought to rest with the governing body or city to inspect from time to time the structural condition of buildings which have stood for a considerable period, and ascertain whether they are in a sound state. As Mr. Caws puts it:—

"When buildings are new the persons properly and immediately responsible for their strength are the architects who have planned and the builders who have erected them, and it is not a good but a bad thing to put upon the shoulders of the Borough Surveyor a share of their responsibility. To divide responsibility is to weaken it, and, as every one knows, it is always very difficult when responsibility is divided to fix the blame.

But when buildings, more especially public build-

ings, are old, the case is quite different. The architects and builders of those ancient structures are no longer to the fore, their responsibility having been fulfilled by the endurance of their work through long lapse of years, and they themselves in many cases being dead and gone. But the Borough Surveyor never dies, and upon his shoulders rightly rests the burden of responsibility and the safety of old public buildings."

In this opinion we entirely concur. Such an event as the Canadian accident ought not to be lost upon us, but ought to be taken as a grave reminder of the necessity of keeping a regular watch on public buildings, which may have been quite structurally efficient when new, but in which, in the course of years, defects may have silently developed, through unexpected causes of decay, or through the initial use of some material which was not as sound and durable as it was perhaps thought to be when the building was erected. It is to be hoped this lesson from the Canadian accident will not be lost sight of.

THE Orleans Railway Company have commenced the preparatory works for the new prolongation of their line to the Quai d'Orsay, which will follow the line of quays on the left bank of the Seine, partly in open cuttings, partly in tunnels. There will only be one intermediate station, beneath the Place St. Michel. From the Rue du Bac the underground line will part into six lines running parallel into the new station at the Cour des Comptes.

The Kaiser Wilhelm Bridge. An important bridge has lately been built in Germany to carry the new railway between Remscheid and Solingen, over the river Wupper. In general outline it very much resembles the bridge constructed over the river Douro, near Oporto, in 1876, as it consists of an arched central span of 525 ft. clear, on either side of which are smaller spans composed of ordinary lattice girders supported on steel piers. The bridge is 1,525 ft. long over all, and the rail level is at a height of 350 ft. above the river. About 5,000 tons of steel were used in its construction, and the cost of the whole work amounted to close upon 137,000*l.* The arch was erected without the use of any staging, the various members of which it is composed being hoisted into position by travelling cranes running upon the side spans, which had been already completed; consequently, the building of each half of the arch proceeded at about the same rate. The final connexion of the two halves was made on March 22 last, and this day being the centenary of the birth of Emperor William I. suggested a suitable name for the structure.

Adulteration of Portland Cement. A USEFUL paper upon the "Adulteration of Portland Cement" was recently communicated to the Society of Chemical Industry by Messrs. Stanger and Blount, the adulterants specially dealt with being Kentish rag-stone and blast-furnace slag. As the result of numerous experiments, the authors have arrived at the conclusion that blast-furnace slag is a more objectionable adulterant than rag-stone; that even the most carefully-prepared slag should be rigidly excluded from all cement which is to be sold as Portland cement, and that the addition of the ordinary, slowly-cooled

furnace-slag may be regarded as that of a useless diluent and makeweight, to say nothing of the danger arising from the slow oxidation of the sulphide of lime which the slag contains, and the consequent expansive stresses likely to occur within the cement after setting. In the case of rag-stone, it is reported that although a perfectly sound cement is merely weakened by the addition of rag-stone, there are certain cements of imperfect manufacture, which are temporarily improved by the addition of a certain proportion of rag-stone; and that, in this latter case, the improvement is brought about by the property which the rag-stone possesses of causing rapid hydration of the quicklime and unstable lime compounds in the cement. The authors consider, however, that the same improvement of the cement can be obtained by mere exposure to the atmosphere for a sufficiently prolonged period. Referring to the addition of gypsum, the authors state that they have not detected any injurious effects arising from the addition of gypsum in quantities not exceeding 2 per cent., which is sometimes resorted to in order to lengthen the setting time of the cement.

Electric Shocks. THE recent death of three workmen from low-pressure electric shocks in a chemical factory in Germany unpleasantly reminds electricians that under certain circumstances low pressures can be dangerous. The maximum possible pressure in the factory was only 230 volts alternating, and the probable pressure which produced the fatal shocks was much less than this. These accidents, which are recorded in the *Electrotechnische Zeitschrift* for December 30, prove that when the walls and floors of the building are for any reason good conductors (in the case considered they were damp) then the electric wires are a source of danger. In one of the cases the workman was turning a winch to raise an arc lamp when one of the terminals of the lamp came in contact with the pulley and he received a fatal shock. The old theory that low-pressure shocks were only dangerous to people in weak health or troubled with heart disease has now been discredited. The accepted theory is that the electricity acts on the nerves in such a way that they contract the arteries, and the blood meets so much resistance that the heart is unable to keep it circulating. The Board of Trade came in for a great deal of adverse criticism when they fixed 250 volts as the low-pressure maximum for alternating current supply, but we have plenty of material now to prove that this pressure is far from being absolutely safe. As long as a workman has dry boots on, and is standing on a fairly insulated floor, accidental contact with a wire at a pressure much greater than 250 volts will not hurt him; but if he make good contact to earth a much less pressure may be fatal. In factories where there is a liability to workmen making a good "earth," low pressure wires, switches, terminals, &c., ought to be carefully insulated.

Kew and Kensington Palaces. It is gratifying to hear that Kew and Kensington Palaces, the latter especially, are to be opened to the public as a kind of museum. Of the history of the two buildings, and the interest attaching to them, we have spoken

ty on other occasions. It is to be hoped that no attempt will be made to modernise interiors, or to do more than necessary repairs.

In St. Mary, Newington Butts, the Manor of Walworth, parish lies a plot of land, about one acre, popularly known as the "waste of Walworth," which being laid out—we believe by the Metropolitan Public Gardens Association—as public recreation ground. The purchase was made with contributions of 5,000*l.* by the London County Council and the Vestry, & 375*l.* by Mr. James Bailey, M.P. The story goes that the ground was granted to William Walworth by Richard II. The Manor of Walworth, the only one in this parish, was held, in the reigns of Edward III. and his successor, by a family who thence derived their name: Margaret de Walworth, believed to be Sir William's widow, is cited as lady of the manor in a register, 1396, of William de Wykeham, Bishop of Winchester, and Sir George Walworth died seised of it in 1474 (Escheats, 13 Edw. IV.), yet these were probably lessees under the ecclesiastical lords of the See. For Domesday Survey scribes Waleorde, 3½ hides and having church, as held by one Bainard, of the Abbot of Canterbury; it had been given to Christ Church, Canterbury, for clothing the monks, by Hitard, or Nithardus, jester of Edmund Ironside, who had bestowed it on him. In 10 Edw. II. the monks did a grant of free warren in the manor which, rated at 37*l.* 8*s.*, King Henry VIII. gave to the dean and prebendaries of Canterbury. On a demesne that appertained to the manor-house stood the old Surrey Zoological Gardens, opened in 1831 by Cross's Ménagerie, from King's Mews, naming - Cross, and finally closed in December, 1875.* On May 23, 1895, was opened the graveyard of St. Peter's Church, by Soane, 1823-5—at the cost, about 700*l.*, the Goldsmiths' Company; a great boon to the district of 632 a., with a population of 15 to the acre. Robert Browning was baptised on June 19, 1812, in York-street chapel, of which his parents were members; the chapel was opened in November, 1891, by Browning Hall, for the Walworth Settlement of the London Congregational Union.

WE record in our obituary column the death of Mr. H. Stacy Marks, who filled in English painting a place which, if not of the first importance, was at all events peculiarly his own. In his figure pictures he combined genuine humour with most conscientious and careful technical execution. These works, as a rule, were not "subject pictures," though at first sight they might be hastily classed in that category; the interest was in the treatment; in the character imparted to the figures, and in the careful treatment of all the details, which could all bear looking into, and yet all kept their place and were never obtrusive. Perhaps a better summary of his talent in this kind of picture could be found than his diploma picture, "Science is Measurement," of the old naturalist measuring the skeleton of a large bird. But the subject itself pointed to the artist's other special faculty, the artistic treatment of birds, and the picture was

* The Concert Hall was built, 1856, by Sir Horace Jones, and Jullien.

most probably suggested by his own studies in bird anatomy. And it is perhaps as a painter of birds that he will, after all, be best remembered. The bird was to him what the dog was to Landseer; and he indulged the humour of giving to the bird an expression of human character, as Landseer did to the dog. But he could dispense with this adventitious source of interest, and his purely realistic water-colour studies of birds form a remarkable collection of beautiful work, with the most delicate appreciation of colour.

MUNCACKZY'S large picture, "Ecce Homo," representing Pilate showing Christ to the people, is a kind of pendant to the previous picture of "Christ before Pilate." It is what may be called a clever and effective kind of stage picture, with no elevation of feeling or style, and painted rather to please the popular mind—a kind of family Bible illustration on a large scale—than with any higher object. It is exhibited, of course, with the usual artificial lighting which adds to the theatrical effect of this kind of picture, and with the usual printed description.

THE exhibition of "Femmes Artistes," at the Georges Petit Gallery, forms a more interesting collection than usual. Among the best works are the pastels of Mdlle. Valentine, of which the "Premier Né" is a charming composition. We may also specially notice the portraits of children by Mdlle. Carpentier, the scenes in Brittany by Mdlle. Fanny Fleury, the studies by Mdlle. Rougier and Mdlle. Isbert, the miniatures by Mdlle. Camille Isbert, and the curious though rather too symbolical paintings by Mdlle. Desbordes. The sculpture is mostly weak; the best things are "Far Niente" by Mdlle. Fresnaye and "Une Egyptienne" by Mdlle. Jozon. At the galleries of the Société de Géographie, in the Boulevard St. Germain, M. Eugène Gallois is exhibiting his drawings and water-colours made during a tour in India, Burma, and Java, some showing the effect of gilt pagodas in strong sunlight, some of them mere sketches in Indian ink in which the artist has very cleverly conveyed the effect of extent and distance. The whole exhibition is a kind of "impressionism," but in that sense very effective.

CONSIDERABLE surprise has been expressed that pictures should be taken from the Tate Gallery and the National Gallery for exhibition at Burlington House among the other works of the late Sir E. Millais. We think that this action of those who have charge of this Gallery can scarcely be supported. It is not right that public pictures should be taken to be exhibited in what is a private exhibition in London; for, after all, that is what an exhibition at Burlington House really is. If it is reasonable to take a Millais from the National Gallery and exhibit it at Burlington House, it would be equally proper to take a Raphael or a work by any other master. Once the practice is begun it may be extended indefinitely. Moreover, any person who might have been anxious to study the various works of Sir E. Millais, had the pictures at the Tate Gallery and the National Gallery been left there, could have done so without any

great trouble. It is not necessary for two pictures to be hung alongside of one another for the purposes of artistic comparison, and possibly a walk from Burlington House to Milbank would enable a student to formulate his ideas before he looked at the pictures at the Tate Gallery.

GLASGOW CATHEDRAL: VAULTING OF THE LOWER CHURCH.

THE following essay forms part of a paper read on December 16 of last year to the Glasgow Archaeological Society, by Mr. T. L. Watson. The paper was partly controversial, in reference to a passage in Messrs. M'Gibbon & Ross's "Ecclesiastical Architecture of Scotland," in which Mr. Watson's view was opposed. The controversial portion we have omitted, giving that portion of the paper which constitutes a consecutive treatment of the subject:—

"The vaulting of the choir and lower church is of five distinct dates, each separated from the others by an interval sufficient to mark the development of the style. This development is indicated by changes in the general design or plan of the vaulting, and by the introduction of new mouldings in the vaulting ribs.

The different sections in their chronological order are as follows:—

1. The south-west compartment of the lower church.
2. The aisles generally of the lower church.
3. The aisles and chapels of the choir or upper church.
4. The middle compartment of the lower church.
5. The stairs of approach to, and the whole or portions of the eastern aisle and eastern chapels of the lower church.

1. The south-west compartment of the lower church comprises two bays and a half at the west end of the south aisle. The mouldings of the vaulting ribs, referred to as A1 and A2, are pointed on the under side; they belong to about the end of the twelfth century, and the vaulting is of this period or the beginning of the thirteenth century. It has, however, been partially reconstructed, if not wholly rebuilt, at a later date.

2. The aisles of the lower church are of date 1230 to 1240. They are without ridge ribs, and their early character is otherwise apparent in their general design and execution. The mouldings of the ribs, B1 and B2, are rounded on the under side, and of the type distinctive of the period. It may be noted here that the vaulting of the central compartment must have been designed originally at the same time as that of the aisles. The vaulting is necessarily among the first things to be worked out in any vaulted building, as it determines the design and spacing of the pillars, the form of the capitals and bases, and practically every detail of its architecture. But this middle vaulting was not only designed originally at this time; it was constructed so far as the lowest or springer stone of each rib or cluster of ribs.

We have, then, the fact of a design prepared at this time for the middle vaulting, but carried out only so far as the springer stones. This design, being of the same period as the aisles, must have been of the same type of vaulting—at all events, it must have been of some type in use at the period; it was to have been carried out, and the springer stones were carried out, with the same type of mouldings as the aisle vaulting. The middle vaulting as it now exists could not have been conceived at the period of the aisle vaulting, while its mouldings, other than those of B section, had not at this time been evolved.

3. The third stage of vaulting illustrated in the Cathedral is seen in the aisles and chapels of the choir or upper church, the date of which is 1240 to 1250. This is more developed in every way than the vaulting of the lower aisles, and it is obviously later, and apparently about ten years later. It possesses the ridge rib—a feature not found in the earlier stages of vaulting—and it introduces a different type of vaulting rib, C1 and C2. This is a rich and elaborate moulding, having a double fileted roll, with hollow between, on the under side. It is the characteristic rib-moulding of the middle of the century—a moulding widely used, and of which the date is not doubtful. In the north aisle the B and C mouldings are

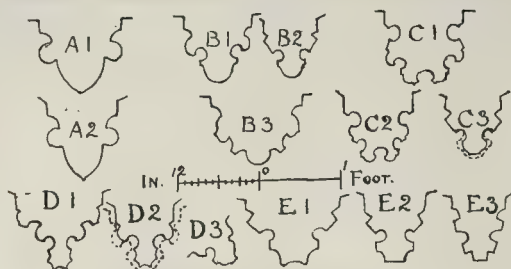


FIG. I. VAULTING RIBS OF LOWER CHURCH.

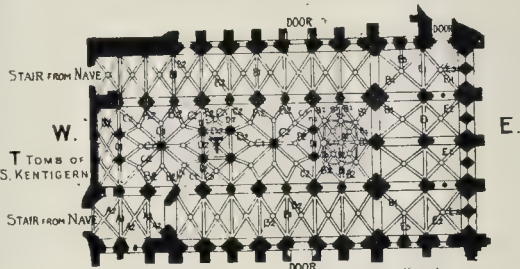


FIG. II. PLAN OF LOWER CHURCH AS IT IS.

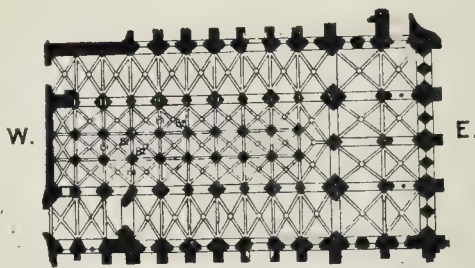
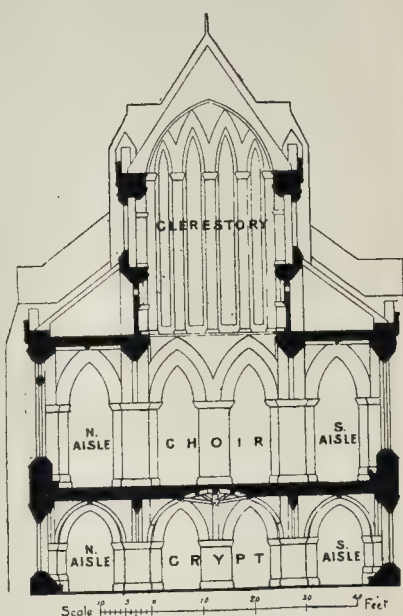


FIG. III. PLAN OF LOWER CHURCH AS FIRST DESIGNED.

Plans and Mouldings of Lower Church, Glasgow Cathedral, and Section of the Cathedral :
from "Proceedings" of Glasgow Archaeological Society.



CROSS SECTION OF CHOIR

used together, while in the south aisle the B moulding is discarded, and the C moulding only used—a fact which indicates that the vaulting of the south aisle is a little later than that of the north aisle.

4. The fourth period is reached with the vaulting of the middle compartment of the lower church as it has been carried out. This is a beautiful and intricate piece of work of the period 1250 to 1260. It requires no minute examination to decide that it is later than the vaulting of the choir aisles, and as we have seen that this again is later than the vaulting of the lower aisles, it follows that between the vaulting of the lower aisles and that of the middle compartment there is a considerable interval of time—an interval which I have estimated at twenty years. If, then, the vaulting of the middle compartment as it exists was designed about twenty years later than that of the lower aisles, it follows, even without further evidence, that its present design is not the original one, which, as we have seen, must have been made at the time of the aisle vaulting. It follows also that as the springer stones were designed and moulded to suit the original plan, they must either have been altered or cut out altogether wherever the new plan was inconsistent with the earlier one.

The rib mouldings of the middle compartment are of great variety and of three different types, B, C, and D. The B mouldings are found springing from the outer pillars and not elsewhere, except twice, where they are used opposite to, and in continuation of, ribs spring-

ing from two of the outer pillars. The inference is that their existence here is due to the old springer stones formed and built in the period of the lower aisle vaulting. The C mouldings we have had already in the choir aisle vaulting, and we find them again in the middle compartment; all the ribs springing from the pillars which occupy a central position in each of the two large squares are of this section. The D ribs are new mouldings introduced at the period to which this part of the work belongs. They are to be found in all the vaulting ribs which spring from the four pillars at the tomb of St. Kentigern, and in most of those of the eastern part of the middle compartment. It is not difficult to recognise from the sections of these ribs that they form an intermediate step between the C and E types of moulding.

One other fact may be noticed here: that the majority of the vaulting ribs which spring from the outer columns have been altered in direction. Some of these have been rather awkwardly twisted from the direction which they were originally designed to take into a new direction. Others have been cut out and replaced, presumably to adapt them to a new direction. We shall return to these later.

5. The fifth and last period of vaulting represented is that over the stairs of approach to the lower church and at the eastern aisle and chapels. The vaulting of the older vaulting of the north and south aisles, and the same plan is followed, but, where possible, with the later E mouldings instead of the B mouldings. The

vaulting over the stairs, however, is unfettered by older work, and we find it therefore characteristic of the period, both in its general design and in its mouldings. We have here not only ridge ribs but tiercerons, or ribs intermediate between the diagonal and wall ribs, which show it to be at all events rather late in the thirteenth century. The moulding of the ribs is that marked E3, and this distinctly connects it with the eastern aisle and chapels where the E1 and E2 ribs are employed, showing, as plainly as mouldings can speak, that the finishing touches of the lower vaulting were put at the western stairs and the eastern chapels at pretty nearly the same time.

In all this there is no 'theory,' but, as it seems to me, demonstrable fact, and I shall never cease to wonder that it should have occurred to any one to question it. There are five distinctly marked periods of vaulting, each introducing a new moulding in the vaulting ribs, and these mouldings form a sequence, the order of which cannot be seriously disputed. In the first section we have the A mouldings; in the second the B mouldings; in the third the B and C mouldings; in the fourth the C and D mouldings, with B mouldings where the old springers dictated their use; in the fifth section we have E mouldings only, except where the junction with earlier work required the B mouldings to be employed.

With regard to the middle compartment, even if the evidence of a change of design had been entirely effaced, we should still know that such a change had taken place, because, when the lower aisles were vaulted, there must have been a contemporary design for the middle vaulting; the work as carried out is not of contemporary design, therefore we know with certainty that the new design was substituted for an older one. So far, however, from the direct evidence having been effaced, it seems to me as clear as the evidence of the existence of the Cathedral itself.

In my papers of 1886 and 1895 a reason was suggested for the delay of the vaulting of the middle compartment, which may be referred to in a few words. Previous to 1174 only small stones were employed in building in this country. With the advent of William of Sens to Canterbury in that year, improved methods and machinery were introduced, and in the early part of the thirteenth century comparatively large stones were commonly used. In our cathedral many of the stones of the clear-story weigh about half a ton, and we must ask

themselves how these large stones were conveyed to their elevated position so far from the outer walls of the building. The mediæval builder worked always with the smallest amount of scaffolding that he could have, and what he did use was of the slightest description. The building was designed to be their own scaffolding, and such further scaffolding as might be required was supported mainly upon the walls and pillars of the building itself. The hoisting apparatus employed was mainly of the windlass and pulley variety, the screw not being in use by the middle of the thirteenth century. The stone was grappled by means of a "lewis", as shown in Villars' contemporary etch of a machine which he describes as the most powerful engine known for raising weights, and it was raised vertically to its position. The builders had not the means of swinging heavy loads horizontally in the air; they had not the scaffolding on which to carry such loads at a great height above the ground; and the loads themselves were too great to be carried far by the workmen, even if they had possessed the scaffolding. It follows that it was of prime necessity to them to be able to convey the larger stones by the hand carts then in use on the level of the ground, as nearly as possible directly under the places which the stones were to occupy on the upper walls. A glance at the cross section of the building will show that to do this involves the delay of a portion of the vaulting till the completion of the clearstory walls and sterner gable. Let it be understood that I am not seeking to prove thus that the middle vaulting was delayed. We know that it was delayed from its own evidence. I am only suggesting what appears to me to be a reasonable explanation of the fact that it was delayed. Any other means of accounting for the fact is forthcoming, let us have it, but let it not be assumed that the period of the middle vaulting is to be determined by the acceptance or rejection of my explanation why it should have been delayed.

Turning now to the east end of the lower church we find four chapels, in three of which the E vaulting ribs only are used. The north chapel has diagonal ribs of B section, while the south chapel has ribs of the E2 section. At the north and south ends of the eastern aisle we have the same peculiarity. The aisle generally is vaulted with the B1 rib, but the rib which springs from the pier between the two windows in each case is of the E2 section. It follows that the vaulting of the eastern aisle and chapels is either wholly or partly of the later date. I submit that the only intelligible explanation of the fact that we have the late moulding on these middle piers is that the work was delayed till the late period. The presence of the moulding is inconceivable on any other hypothesis. I take it, then, as proved that the middle piers of these windows, with a great part of the vaulting of the eastern aisle and chapels, were delayed until about the conclusion of the work. Two reasons may be suggested why the piers and vaulting should have been delayed; first, to provide a roadway for the conveyance of material into the building, and, second, to admit light while the middle vaulting was approaching completion. It will be noted that there is no other means of introducing materials on the level of the soil except by the two doors. But these doors are too narrow for the purpose. It is true that wide openings might have been left where the doors were to be built, or at any of the aisle windows; but this would have been useless, as the intervals between the pillars of the main arcade are also too narrow to admit of the required roads. The eastern arches are much wider, and offer the only means of carrying a serviceable roadway into the interior of the building. It has been objected that the introduction of the material by the eastern aisle involves taking it down to the lowest part of the site as a preliminary to raising it to the walls of the building. This is true, but, so far from being a disadvantage, the fall of the ground would be of the greatest assistance by permitting the formation of an inclined roadway from the point at which the stone is worked to that at which it is handed over to the hoisting apparatus. By delaying the eastern vaulting and part of the walls the collateral advantage is gained that light is admitted to the middle compartment

while that section of the vaulting is being completed. I repeat what I have said already with reference to the reason for the delay of the middle vaulting. I have given a probable reason why portions of the wall and vaulting at the east end should have been delayed; but the proof—and I submit the conclusive proof—that they were delayed lies in the fact that the vaulting ribs are of the late or E section. I can find no other convenient means of carrying on the work with the appliances at the disposal of a thirteenth century builders; but, whatever may have been the reason, the fact remains that these middle piers and the eastern vaulting were delayed, and the proof is seen in the lateness of the mouldings.

It is easy to understand how the difference of date between the vaulting of the aisles and middle compartment, as well as the change of design in the latter, should have so long escaped notice. The lower church is so dark that details cannot be seen properly without artificial light, and the points at which the change is most clearly traced—the springer stones on the inside of the main arcade—are the darkest parts of the building. It is interesting to note that a suspicion of the truth must have occurred to Fergusson. In his 'Handbook of Architecture,' second edition, 1859, pages 899-901, I find the following:—"The glory of this cathedral is its crypt, which is unrivalled in Britain, and, indeed, perhaps in Europe. As already remarked, the English crypts were built during the Norman period, or very early in the age of the Pointed style. That at Glasgow belongs to the Perfected style of the thirteenth century, and as the ground falls rapidly towards the west [this should be towards the east] 'the architect was enabled to give it all the height required, and to light it with perfect ease. Here the crypt actually extends under and beyond the whole choir. Had there been an opening in the centre of the vault (and it is by no means clear that one was not originally intended), it would be more like a German double church than anything found in England. There is a solidity in its architecture, a richness in its vaulting, and a variety of perspective in the spacing of its pillars, which make it one of the most perfect pieces of architecture in these islands.'

There is no evidence of an intention to leave an opening in the centre of the vault, but the passage suggests that Fergusson must have carried away a vague impression of a difference in date between the aisles and middle vaulting, and of a change of design in the latter. No other writer, so far as I know, had observed even so much as this previous to 1886."

SIR W. RICHMOND ON LEIGHTON AND MILLAIS.

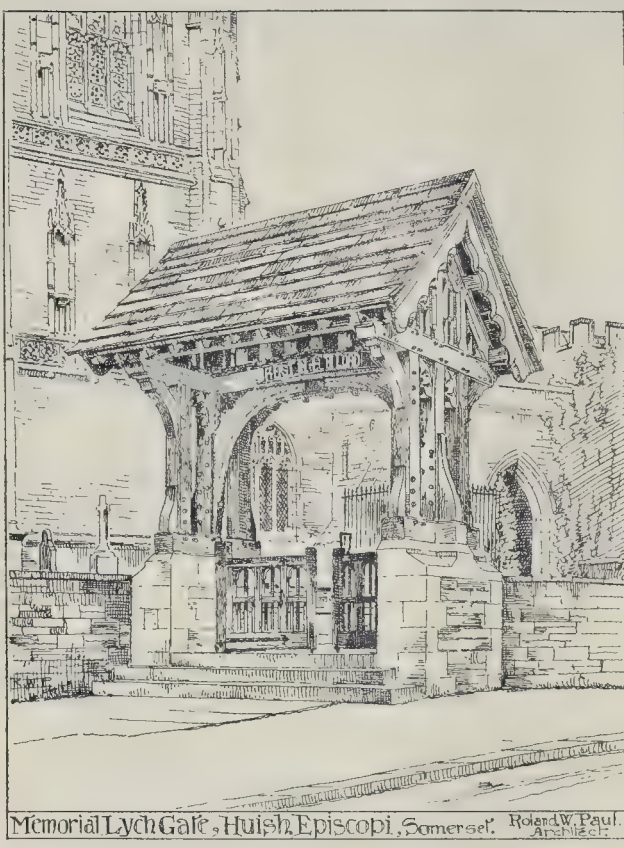
SIR W. RICHMOND'S first Royal Academy lecture, on Monday afternoon, was announced as being "in memory of two great artists," though he added the name of Morris as one who, in his influence on every-day art and in his remarkable character, was worthy to be grouped with Leighton and Millais. The lecture, however, was chiefly occupied with the two painters, and the lecturer skilfully contrived to deduce from the consideration of their works some important lessons in regard to art generally. Touching on the value of sincerity of aim in art, and referring next to the vast, he might say undiscovered boundaries of human interest open to us in art as in nature, he said the means employed might differ, but the end was the same in all true art—a "personal statement" of what the artist sees or originates. Some of us were realists, some idealists; some prosaic, some poets: all were acceptable, and the artist who was one of these was not to be blamed because he was not the other. The only question was, whether the work was well done according to its kind. To find the balance of the performance with the motive was the function of true criticism. The mind was only capable of appreciation when it had cast aside preference (in regard to aim or method) and had assumed an attitude of sympathy or discovery. Leighton's art, he went on to say, was remarkable for its consistency of aim from first to last, showing the growth and development of a mind singularly alive, from the first, to the beauty of form. His early training in the school of the German stylists gave the direction to a scholarly temperament and a singularly accumulative and logical intelligence. Definite outlines of selected shapes were analysed with

the minutest care; his drawing was restrained by considerations of form almost as verse was by considerations of metre; he made sonnets in pencil or pigments; his aim; his pictures were marked by good workmanship throughout. His first exhibited work, the "Cimabue," displayed a sense of style even rarer than that now. At that time Millais had done some of his noblest works—the "Huguenots," the "Autumn Leaves," and that marvellous masterpiece, "The Carpenter's Shop." He was trained by the Royal Academy; as a boy he rivalled Etty, he was a colourist at sixteen; at twenty he changed his style under the influence of Rossetti. Leighton was not subject to this kind of vacillation; but, different as the two artists were in temperament and genius, they obeyed, and handed on, an old but excellent maxim: "Learn to draw accurately; facility will follow;" a maxim not much before the minds of that school who had borrowed not the best but the worst from the other side of the silver streak. With all the freedom of his middle period of painting, Millais' earnest investigations into nature, and the accuracy of his eye, enabled him to employ a freedom of technique which was slight, even sketchy, but never careless. Millais could never have painted the chair, for instance, in the picture of the Arctic discoverer, if he had not in early life done such work as the "Carpenter's Shop." The more eclectic nature of Leighton's studies gave a cosmopolitan character to his art, more difficult for the British mind to accept than the wholly English style of Millais. Love of Form had never obtained a great hold on the public taste of this country in regard to the Arts, in spite of our possessing some of the greatest masters of form in our literature; and the English liking for what can be expressed in words had determined them towards a view of the art of painting primarily of a literary kind. The subject of a picture might be delightful, but that had nothing to do with its merits. It was perhaps the aloofness of Leighton's method from methods of expression common to literature which made it, to many people, difficult to understand. On the other hand, while Millais' art appealed to painters on account of its mastery and technical felicity, it appealed also to a very large public on account of his power of telling a story in a popular manner in paint. That was at the root of Millais' great success; every one could understand him.* "I have indicated," he continued, "that the impression conveyed by the art of Leighton is, in the first place, non-literary. It is built upon an emotion whose source is derived from an abstract sense of form and colour, and not from a literary formula. In that sense it is akin to music, in that they both appeal first to our æsthetic senses, and to emotions whose roots are rhythm, proportion, harmony, accent, and colour, and this definition leads one naturally to associate the aim to reveal abstract beauty (which is the province of the decorative artist and the musician) with architecture, the most abstract of the arts. And that is why, I suppose, such art is called 'decorative.' Now art which emanates from a decorative motive, and having for its first intention the regard for beauty of form and colour as sufficient in themselves to arouse hearty sympathy, as well as to complete enjoyment, has never, and probably never will, appeal to any but the cultivated few whose taste is supremely directed. That minute and delicate power of discriminating among Nature's handiwork the fine line of difference which exists between what is *quite* beautiful or *nearly* beautiful in form, is not only a very rare gift among artists, but it is, when present with them, a gift that they have sedulously to cultivate. And this is not hypercriticism, it is true, if applied to the great periods of Art even in Greece. If it is a rare artistic gift, how few indeed, outside the artistic circle, are there likely to be found, who have sufficiently refined instincts to start with, or visions sufficiently cultivated, to appreciate the rare beauties which the artist has seen and delineated, while he himself is only too keenly aware of his shortcomings, admitting at the same time the obdurate restrictions imposed upon him by clumsy tools and pigments which can but inadequately render delicate transitions from form to form, plane to plane, and tint to tint.

"You should bear in mind these thoughts which I have suggested to you, and apply them, when you remember the comprehensive exhibition of last year, and contrast the

* Or thought they could?—Ed.

* I was informed recently by a working mason, that when employed on certain repairs to the cathedral about four years ago, he cut into a lewis hole in one of the stones of the building.—T. L. W.



splendid work that it contained, with the superb show of this. Study the excellence of the work of those two great painters, and admire its difference!" The "Daphnephoria," the lecturer said, was the picture that most exhaustively combined the different elements of Leighton's art, his most homogeneous and consummate performance. Among Millais' pictures it was thought by not a few that "St. Agnes' Eve" was that in which all the qualities of his art, his poetic intuition, his resource of colour, and his strangely realistic and dramatic conception, were best illustrated. The representation of moonlight, with all its strange and weird effects of light and colour, was such as only a colourist of the first order could have achieved. Leighton's "Summer Moon" had not the same realism; it hardly did more than suggest moonlight; its calm tone and restrained colour imparted to it an abstract poetry of a different kind to the other; the former would appeal most to the painter, both appealed alike to the poet. The lecturer then touched on the successive styles of Millais, and the intellectual interest and refinement of his portraits, but recommended to students especially the study of "The Carpenter's Shop" and "Sir Isumbras." In the course of his summary of his subject, the lecturer said that it might be frankly stated that there were during three decades of this century pictures painted by Millais, Rossetti, Madox Brown, and Leighton (he was not permitted to name living painters) which were fit to hang side by side with the masterpieces of the fourteenth, fifteenth, and sixteenth centuries of Italian art. "England, the much abused, must be congratulated. Let us sometimes put in a good word for the art of our own country."

QUEEN-STREET SCHOOLS, DOVER.—We omitted to mention in the brief account of these schools in our last issue that the floors were laid with "Roger Lowe's Patent Wood Block Flooring."

LYCH GATE, HUISH EPISCOPI.

THE new lych gate here illustrated has just been completed and erected at the chief entrance to the churchyard at Huish Episcopi, near Langport, Somerset, as a memorial to the late Mr. W. B. Paul, of Wearne Wyche. The church is a well known one, with a fine western tower of Perpendicular date, and the lych gate has been carried out as far as possible in harmony with the prevailing style of the church. The upper part is of oak, and rests on two dwarf walls, 3 ft. high, of local lias with Ham stone dressings. The general design is shown in our illustration. The gables are filled with simple Perpendicular tracery, and over the tie-beam forming a connexion between the gables is an arcade, which, in its turn, carries the collars. The words "Rest in the Lord," have been introduced in undercut letters on the west face of the tie-beam. The double gates, opening from the centre, are likewise of oak, with wrought-iron hinges. Pibsbury stone has been used for the platform and steps. Three more steps, a little east of the gate, lead up to the level of the churchyard path. As will be seen by the illustration, the gate stands at a slight angle with the church, and is slightly west of the old churchyard gate now removed. The work has been carried out by Messrs. Yandle & Sons, of Martock, from the designs and under the superintendence of the architect, Mr. Roland W. Paul, of London.

MANION, ISLAND OF RUM.—A mansion house is being erected on the Island of Rum, facing the entrance to Kinloch Bay eastward, for Mr. G. Bullough. The main tower of the building is to be 60 ft. in height, and the other four towers, which occupy the corners of the rectangular building, 40 ft. A verandah, 7 ft. wide, surrounds the whole mansion house, with the exception of the west elevation. The architects are Messrs. Leeming & Leeming, London, and the contractors for the works Messrs. John Copeland & Sons, Uddingston, Glasgow.

THE HAVANA DRY DOCK.

A floating graving dock was recently constructed for the Spanish Colonial Office for use in the island of Cuba at the port of Havana, where some accommodation of this character has been rendered necessary by the insurrection, compelling the Spanish Government to send a somewhat large fleet to the Gulf of Mexico.

The dock, which was launched at the end of last October, is 450 ft. long, 82 ft. wide between the broad allars, and has a depth of water over the sill of 27 ft. 6 in. It is constructed of ordinary mild steel, and has a lifting capacity of 22 tons per foot run of length.

Unlike other floating docks, it is open at both ends, so that ships of more than 450 ft. in length can be dealt with, providing their weight is not too great. Caissons are, however, provided for closing the ends should war vessels of great tonnage and of moderate length have to be docked. The dock is said to have cost about £180,000, and an interesting feature of the undertaking is that the pumps for emptying it are driven by electricity.

This huge floating-box was towed to Cuba apparently without difficulty, but early last month, according to the report in the *Scientific American*, it began to sink slowly—until it was beneath the waters of the bay. The unexpected disappearance of the dock created great consternation in the Navy Department and in the Palace of the Captain-General. The dock went down slowly and majestically, and no one appears to know what was the matter with it. It is thought by some that the Cuban insurgents had something to do with the sinking, but this seems impossible, as the dock could be easily guarded. Fortunately those engaged on the dock had plenty of time to save themselves, but had it sunk suddenly there would probably have been great loss of life.

Over 200 men were soon working to refloat the dock, and no doubt before long it will be again ready for use.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. W. E. Willink, M.A., took the chair on the 10th inst. at the fourth ordinary meeting of the fiftieth session of the Liverpool Architectural Society, which was held in the Law Library, Union-court, and at which a paper was read by Mr. Beresford Pite, whose subject was "The Architecture of Michelangelo." Mr. Pite said that the accepted verdict of architectural historians and critics was that Michelangelo's influence was detrimental to architecture. He then enlarged upon the extent and reasons of Michelangelo's influence, the great architect's mastery of the arts of design in sculpture and painting, and the noble character of his intellect. The importance of St. Peter's at Rome was emphasised. Imitative followers without his powers or opportunities came after him. His practical faith in the unity of art was evidenced in his work in the three directions of sculpture, painting, and architecture. There were the Madonna in San Lorenzo, in Florence, and the Pietà in St. Peter's in sculpture, and the figures of the ceiling of the Sistine Chapel in painting, which were instanced as having a basis of constructive design and expressing ideas of scale, grandeur, breadth, and dignity of line in composition. Those qualities also existed in Michelangelo's architectural designs. Towards the close of his paper Mr. Pite referred to the length and variety of Michelangelo's life and the quiet power of persistence which the great artist possessed.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of this society was held on the 11th inst., at the School of Art, Arundel-street. The chair was occupied by Mr. J. Smith, vice-president; and Mr. W. C. Fenton delivered a lecture on "Sanitary engineering as applied to buildings." Mr. Fenton commenced by defining sanitary engineering as embracing everything in connexion with buildings, from the sewers in the street to the light and ventilation of the room, and everything affecting the health and well-being of the inhabitant for the time being. He urged the importance of architects and surveyors carrying out the whole of the sanitary engineering details in connexion with buildings and the development of estates. Having referred to a previous lecture on the same subject in February, 1896, he then mentioned the progress in works of



Sketches of Wrought-Iron Work, South Kensington Museum. By Mr. T. E. Hardy.

tary engineering which had taken place in, for the benefit of the inhabitants of, Sheffield. The powers conferred on the authorities by the Corporation and Public Health Acts, 1840, the Factory Acts of 1801 and 1805, and Provisional Orders (by which powers were aimed to enforce the construction of water-sets, in preference to the old privy middens) are discussed in detail. The repeal of the building by-laws, and the enforcement of the present code, were referred to as being the means of producing better work in buildings and streets in their sanitary details. By the session of the water-supply by the city, much needed improvements had been made visible in the construction of water-closets and various sanitary fittings, which had also the salutary effect of reducing the objections formerly raised against them. The lecturer alluded to the unfairness of some drains, and said that well-laid drains, with good joints, ought not to be subjected to a weight of water pressure exceeding 2 ft. In discussing various details of sanitary engineering, he referred to the construction of cesspools in the old parts of the city, and the different systems adopted in the construction of sewers in new roads and building estates, and various methods of ventilation in connexion therewith. The difficulties experienced by local authorities, architects, and owners with reference to the question of "combined drainage" were dealt with by the lecturer. The present system of ranging drainage affected by this question was not satisfactory from a sanitary point of view. The construction of house drainage, size and materials of pipes, form of inspection chamber, and the materials to be used for same, were described and discussed. The different varieties of "traps" were described, and the best ones recommended. Some towns were unprovided in connexion with this matter. The proper arrangement of inlets and outlets for the purification and ventilation of the drains was also noted, and their construction explained. Drains pipes and their joints, with proper tests to be employed, were described, and difficulties in connexion therewith met. He concluded with the hope that the views he had that night laid before the Society would result in discussion which would be for their mutual benefit, and a productive of improvement in sanitary construction. The lecture was followed by discussion, in which Messrs. Fowler, Gibbs, Thelen, Flockton, T. Winder, C. J. Innocent, W. G. Buck, J. R. Wigfull, J. B. Mitchell-Waters, and the Chairman, took part, and a vote of thanks was passed to the lecturer.—*Sheffield Independent*.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution, on Tuesday, Sir John Wolfe Barry, K.C.B., F.R.S., the President, referred, before the ordinary business, to the recent death of Sir Charles Hutton Gregory, and the following resolution, submitted by the Council, was adopted unanimously by the meeting:—"That the members of the Institution deeply regret the death of Sir Charles Hutton Gregory, K.C.M.G., Past President, whose association with the Institution during a

period of almost sixty years has been marked by unremitting interest in its welfare." The paper then read was on "The Machinery used in the Manufacture of Cordite," by Mr. E. W. Anderson, Assoc.M.Inst.C.E. The paper concluded with a description of a typical factory of moderate size, upon a plan generally suitable for private manufacturers. It was announced that two Associate members had been transferred to the class of members. At the same meeting it was reported that five candidates had been admitted as students. The monthly ballot resulted in the election of two members.

COMPETITIONS.

CHURCH, SOUTHEEND.—The plans of Mr. Charles Nicholson, of the firm of Messrs. Nicholson & Corlette, of 28, Theobalds-road, Gray's Inn, have been accepted for a new church to be erected in West Southeend. The building will accommodate between four and five hundred worshippers, and when completed will cost about 3,000*l*.

LUNATIC ASYLUM, BIRMINGHAM.—It is stated that at a meeting of the Birmingham Lunatic Asylums Committee held on the 3rd inst., it was decided to appoint an assessor to advise the committee upon the competitive plans for the new lunatic asylum Mr. G. T. Hine, of Parliament-street, Westminster.

TECHNICAL SCHOOLS, COLENE.—At a recent meeting of Colne Town Council the chairman of the Technical Instruction Committee reported that Mr. Beaumont, the assessor for the competitive plans, had made his awards, viz., that the first premium, 50*l*., should be awarded to Messrs. Woodhouse & Willoughby, Manchester, and the second, 35*l*., to Mr. T. A. Buttery, of Morley, Yorkshire.

PIER, MENAI BRIDGE.—At a recent ordinary meeting of the Menai Bridge District Council, the report was considered of the Pier Committee upon the various plans and estimates received for the erection of the new pier proposed to be built in order to meet the demands of the increasing traffic between Liverpool and North Wales.—Mr. R. G. Thomas, the chairman, reported that plans had been submitted for the following:—Messrs. Mayo & Haley, Manchester, 3,373*l*.; Mr. J. L. Roberts, London, 2,900*l*.; Mr. F. J. Webster, Westminster, 3,000*l*.; Mr. Martin de Ville, Ashton-on-Mersey, 2,097*l*.; Messrs. Featherstone & Gilmore, Westminster, 2,900*l*.; Mr. H. Woodhouse, Liverpool, 3,051*l*.; Messrs. Read & Beer, Westminster, 2,887*l*.; and Mr. John Hughes, Manchester. The Committee, on the recommendation of the Chairman, urged the Council to adopt the plans of Mr. Webster. On the motion of Mr. J. Williams, seconded by Mr. G. Hand, the report was adopted.

FIRE STATION, BOOTLE.—Twenty-two competitive plans for the proposed new fire station at Bootle have been sent in. The author of the selected plans will receive, as his award, the appointment of architect of the buildings, with commission upon the contract; and a second premium of 25 guineas is also offered. The scheme, excluding the cost of the site, which is situated in Irlam-road, is not to exceed 15,000*l*., and, in the event of the Local

Government Board refusing to sanction the borrowing of the money, the successful competitor will receive 50 guineas as remuneration for his work. In the plans of the proposed fire station, house accommodation has been made for twenty married and ten single men.

SKETCHES OF WROUGHT-IRON WORK SOUTH KENSINGTON MUSEUM.

THESE are a few characteristic bits of wrought-iron work from sketches by Mr. T. E. Hardy. The following notes will sufficiently describe them:—

1. Gate in wrought-iron work. Italian; seventeenth century.
2. Door knocker. Old French. Length 8½ in.
3. Door knocker. German; sixteenth century.
4. Handle of latch. German; seventeenth century. Length 6½ in.; height 2½ in.
5. Portion of right-handed hinge-plate. German; eighteenth century. Length 17½ in.; width 16½ in.
6. Hinge in tinned iron. German; seventeenth century. Length 5½ in.; width 3½ in.
7. Ornament for keyhole. French; late fifteenth century. Greatest length 8½ in.; width of leaf, 4½ in.
8. Portion of door-hinge. German; about 1600. Length 14½ in.; width 7½ in.

THE SURVEYORS' INSTITUTION.

An ordinary fortnightly meeting of this Institution was held on Monday evening in the temporary premises of the Institution, Savoy-street, Victoria Embankment, the President, Mr. Christopher Oakley, occupying the chair.

The minutes of the previous meeting having been read and confirmed, the President called upon Mr. A. Buck to resume the discussion—adjourned from the last meeting—on Mr. F. Punched's paper on "The Amendments of the Agricultural Holdings Act suggested in the Report of the Royal Commission on Agriculture." Letters were read on the subject from Mr. F. Punched, Mr. Channing, M.P., and Mr. Jasper Moor. The discussion was continued by Messrs. E. P. Squarey, J. A. Eggar, J. H. Sabin, and G. J. M. Burnett.

The vote of thanks having been agreed to, the President announced that the next meeting would be held on the 24th inst., when Mr. A. A. Hudson would read a paper on "Surveyors and Arbitration."

THE LONDON BUILDING ACT, 1894:

THE TRIBUNAL OF APPEAL AND ITS JURISDICTION.

The Tribunal of Appeal under the London Building Act, 1894, sat at the Arbitration-room of the Surveyors' Institution, Savoy-street, W.C., on Monday, to hear an appeal made by Major George Faynter against the notice of objection, dated November 24th, 1897, by Mr. T. H. Watson, District Surveyor for St. George's, Hanover-square, in the matter of the erection of a building on the site of Nos. 12 and 13, Grafton-street, W., under Sections 43 and 150 of the Act.

The members of the Tribunal sitting were: Messrs. Arthur Cates (Chairman), J. W. Penfold, and A. A. Hudson.

The appellant was represented by Mr. A. H. Poyser, barrister (instructed by Messrs. Sandilands & Co.), while there appeared for the respondents, Mr. Horace Avery, barrister, who was instructed by Mr. Seager Barry, from the Building Act Department of the London County Council.

At the outset, Mr. Horace Avery said he had a technical objection to raise as to the jurisdiction of the Tribunal, and went on to point out that originally the District Surveyor's objection was based on Section 150 of the Act, and the ground assigned was that the appellant proposed to deviate from the plans already certified by the District Surveyor, and that, moreover, the proposed building would be contravening Section 41, Sub-sections 1 and 2, inasmuch as no provision was made in the rear of the proposed building for sufficient open space, as required by the Act. Upon that objection the owner was taken before the magistrate at Marlborough Police-court. For Major Paynter the point was raised that the objection under Section 150 was bad, because the building which it was proposed to re-erect existed at the passing of the Act, and that, therefore, it came within the operation of Section 43. That was upheld by the magistrate, who, however, agreed to state a case. On this (Mr. Avery's) advice, no further action was taken in the direction of an appeal in the High Courts, but an amended notice was served under Sections 43 and 150. That amended notice having been served, the owners again went before the magistrate, taking as their point of objection that under this amended notice they had a right of appeal to this Tribunal. On this ground they asked the magistrate not to hear the matter. He (Mr. Avery) pressed the magistrate to hear and decide the case, but the present appellant prevailed upon the learned gentleman to adjourn the hearing in order that he might come before the Tribunal upon the amended objection. With the greatest respect to the Tribunal he (the learned counsel) submitted that the appeal obviously involved an important point of law—that relating to deviation—which should have been decided by the magistrate. Moreover, the Tribunal had to consider another point. Was Major Paynter appealing from a decision of the District Surveyor under Section 43? What, in fact, the Major was appealing against was the decision of the District Surveyor, under Section 150; and he contended that before the Tribunal could exercise jurisdiction the appellant must show that his appeal came under Section 43. He was aware that it would be said on the other side that, although the District Surveyor's decision was under Section 150, yet the fact that that official named Section 43 as having been contravened entitled them to regard the objection as a decision under Section 43. This contention could not, he submitted, be supported for one moment, for there was no trace in Section 43 of the power of a District Surveyor to give a decision except as to the correctness of plans. The learned counsel supported his contention by quoting from the regulations governing the Tribunal. The all-important question underlying this appeal was that of "deviation," but he proposed to allow that to stand aside pending the decision of the Tribunal on the preliminary point he had submitted.

Mr. Poyser contended that the "objection" of the Surveyor must, for the purposes of the Act, be regarded as a "decision." Under Section 150, it was necessary, not only for the District Surveyor to serve a notice that the Act had been contravened, but he must point out where the contravention lay in. This Mr. Watson did, naming Section 43 as the particular section contravened. That being so, it was clearly a "decision" under Section 43. He asked the Tribunal to remember that what was intended by this section, was primarily the protection of persons with vested interests, and the Tribunal was intended to guard against any onslaught upon those interests. By limiting the appeal to Section 150 the appellant would be denied this protection. He would urge, moreover, that when a question as to the jurisdiction of the Court was raised it was the duty of the Tribunal to uphold its own position until overruled, a order that the appellants might be accorded the protection it could afford. Dealing with the regulations, the learned counsel cited Section 180 of the Act to show that they were intended only to deal with the procedure of the Tribunal, and in so far as they exceeded the provisions of the Act, were undoubtedly *ultra vires*. If the Tribunal held that it had no jurisdiction under Section 43, then it would be just as well to wipe out that section altogether. He reminded the Court that in the case of Boyce it had already exercised jurisdiction under Section 43.

Mr. Avery replied that the decision in the case of Boyce was come to without arguments being heard, and went on to point out that the result of overruling his objection would be that the Marlborough street magistrate would not be bound by the decision of the Tribunal, nor would the Tribunal be bound by the decision of the magistrate. Thus, the dilemma of conflicting decisions by different Courts, the possibility of which had been studiously guarded against in drafting the Act, would arise. As to the question of deviation, it was so important that the ruling of the Higher Courts would certainly have to be taken upon it.

The Chairman remarked that in such an

eventuality it would, perhaps, be as well for the Tribunal to hear the facts.

Mr. Avery said the only facts necessary for the purpose of appeal on that point were that the notice was served and that an appeal was made to the magistrate. He certainly had no objection to the Tribunal going into the question of deviation, but if an appeal were made to the Queen's Bench upon the point of jurisdiction and the Tribunal's jurisdiction were ousted, its decision upon the question of deviation would obviously be of no practical use.

Mr. Poyser: We are so convinced of the Tribunal's power to adjudicate that we will willingly take the risk of that.

After deliberating privately, the Chairman said his colleagues and himself had given careful consideration to the arguments. It appeared to them that Section 43 contemplated a simple procedure. If the builder desired to deviate he might apply to the Council; if he did not so desire, he could proceed to give a building notice, and thus bring himself within Section 150. The Tribunal did not think that Section 43 authorised either the Council or the District Surveyor to decide whether there was or was not a deviation from the certified plan; the only jurisdiction of the Council being, on application to them, to sanction a deviation on conditions. That being the view of the Tribunal, the notice of objection stating that the building owner proposed to deviate from the certified plan, was not a decision under Section 43. Therefore, they held that they had no jurisdiction. No order was made as to costs.

Books.

Industrial Democracy. By SIDNEY and BEATRICE WEBB. In two volumes. London, New York, and Bombay: Longmans & Co., 1897.

THESE two substantial volumes may be regarded as in some senses a supplement to the same authors' "History of Trades-Unionism," which was published in 1894. It is a further instance of the time, labour, and ability which Mr. and Mrs. Webb have spent on this important subject. The object of the work is briefly stated in the opening lines of the preface:—We have attempted in these volumes to give a scientific analysis of Trades-Unionism in the United Kingdom. Both the title and the so-called scientific analysis are in some senses misleading. In saying this, we in no way wish to detract from the value and merit of this book; but if any one will consider for a moment he will perceive that the words "industrial democracy" are exceedingly vague, and when he has perused the work he will find that it is rather a consideration and a description of the trades-unions of the United Kingdom than a scientific analysis. "Trades-Unions Considered" would a century ago have been the title which would have been given to the work.

The first four chapters fall under the heading which comprises Part I.—of "Trades-Union Structure," and the third chapter is called "The Unit of Government." This seems to be a good instance of the pseudo-scientific character of the book. The real gist of the chapter is to show how the area of a trades-union is based on the extent of a trade, and is not limited by local boundaries. An interesting account is given of the way in which local divisions have been overcome, and of the difficulties which have stood in the way of the present extent of trades-unions. But it is absurd to speak in this way of the unit of government. The unit in local government at the present day is the Parish Council, but the fact that a trades-union has no local boundaries does not make the trade-union a unit in workmen's organisation. But these criticisms as to the manner of the work cannot, we repeat, impair its substantial value.

Perhaps one of the most striking points which is brought out by this book is that of the great power of the permanent officials of a trade-union. "The setting apart of one man to do the clerical work destroyed the possibility of equal and identical service by all the members, and laid the foundation of a separate governing class." Once chosen for this post the general secretary could rely with confidence, unless he proved himself obviously unfit or grossly incompetent, on being annually elected. The paramount necessity of efficient administration has co-operated with this permanence in producing a progressive differentiation of an official governing class, more and more marked off by character, training, and duties from the bulk of

the members. The annual election of the general secretary by a popular vote, far from leading to frequent rotation of office and equal service by all the members, has in fact, invariably resulted in permanence of tenure exceeding even that of the English Civil servant. There cannot be a doubt that this commanding position of the general secretary has had a very remarkable effect on the position of many trades-unions. It has placed what may be termed the policy of the union over and over again in the hands of single man, ambitious, energetic, and to a large extent outside the actual influences which affect the body of unionists. If, for example, we take strikes, a general secretary becomes much like a military General; to gain an object he is prepared to sacrifice his men. He is not an actual wage-earner himself. He has policies and aims to carry out which may be actually adverse to the present prosperity of his union, though they may affect something important in the remote future. On the other hand, no doubt, the efficiency of the unions is largely attributable "to the existence of the adequate, highly-trained, and relatively well-paid and permanent civil service." No doubt, also, a secretary must watch the movements among his industrial constituents, though at the same time he can largely bend those movements so as to forward his own policy.

A chapter of special interest to the readers of this Journal is that which is entitled "Sanitation and Safety." There cannot be a doubt that trades-unions have done much both for the health and the safety of manual workers, though in regard to health there has been such a general spirit of progress throughout every class of the community, that we do not think any great credit can be given to the trades-unions in this respect. They have reflected a feeling general throughout the country. It would be interesting while on this part of the subject to advert to another point, namely, why should the State insist on workmen having healthy buildings to work in and yet not fix a standard rate of wages and a normal day? It is obvious that there is an essential difference, the particulars of which might be developed at length. It is sufficient here to note this point, since it shows how many interesting subjects of consideration are raised in the book, which could not have been published at a more opportune moment. What is needed is that every one should formulate his opinions on the subject of trades-unions by considering the facts relating to them. In no other works than those of Mr. and Mrs. Webb is it possible to find such a mass of important information presented in such a form that any intelligent person may find his facts for himself.

The Year's Art, 1898. Compiled by A. C. R. CARTER. London: Virtue & Co. 1898.

THIS is the nineteenth annual issue of this useful publication; which contains, as usual, a record of the principal events of the year in the artistic world, with statistical information as to the various artistic societies of the kingdom. An alphabetical list is given of the exhibitors of the Royal Academy, and a list of all the Chantry bequest purchases since the first application of the fund; a list of the art sales of 1897, and of engravings and etchings published during the year, &c., &c. The volume, like several of its predecessors, is interleaved with portraits of well-known artists. The small illustrations, a number on one page, of works exhibited during the year, are less numerous than they were in former issues, and appear to be confined to illustrations of provincial exhibitions; it is perhaps supposed that the London exhibitions are sufficiently commemorated in the various illustrated records of them already published. The volume contains an article on the Art of the past year, by the Editor, and "Notes on Architecture in 1897," by Mr. H. Heathcote Statham. The successive volumes of this publication will form in time a very valuable repository of information as to the art exhibitions of former years, and the dates of various paintings and other works of art.

Notes on Carpentry and Joinery. By THOMAS JAY EVANS. Vol. I.—First Stage or Elementary Course. London: Chapman & Hall, 1897.

If such were needed, this book is a justification of the position taken up by the Royal Institute

British Architects, the University of London, and other bodies who hold examinations without providing classes, lectures, or other tuition—the instruction of those who come to be examined. It was only last year, for the first time, that The City and Guilds of London Institute held an examination of a preliminary or elementary character to indicate the kind of studies that should be pursued by a boy on leaving school and intending to learn the trade of a carpenter or joiner; and in this volume which has just appeared there is given a very complete course of instruction in the subjects required for that examination.

The author states in the preface that “these notes have been primarily prepared to assist students who are preparing for the various examinations in carpentry and joinery of the City and Guilds of London Institute, The Worshipful Company of Carpenters, and the Technical Education Board of the London County Council; but it is hoped that others who are engaged in the building trades will find them useful.” This hope is one that can hardly fail of realisation, for we have rarely seen expressed with an equal amount of clearness and lucidity the absolutely necessary knowledge of geometry, plane and solid, including isometric projection, that is given in this very admirable manual. And every student of construction, whether he intends to earn his livelihood as an architect or as a builder, ought to make himself thoroughly conversant with the subject as explained in this book.

There are also some useful chapters on the resolution of forces, the mechanical contrivances, and simple statical problems. The few blemishes that occur in literary expression can be forgiven in a book of this kind which explains clearly so many things that the student ought to know, but we hope that when the new edition is required the author will amend the faulty construction of his pointed arches, all of which he shows with keystone instead of central joint, a mistake which carpenters too often make when they try to draw masonry. *Ne sutor ultra crepidam.*

Lockwood's Builders' Price Book for 1898. Edited by FRANCIS T. W. MILLER, A.R.I.B.A., London: Crosby Lockwood & Son. 1898.

This annual volume, which has now taken its position amongst the builder's price-books, is again before us, and well sustains its reputation. The work appears to have been carefully revised to bring it up to date, and the prices are fairly consistent throughout the book. A twenty per cent. profit is apparently the basis upon which generally the prices are made up. It would be well if the Editor were to state at the outset, the approximate (at least) profit allowed.

In addition to the prices of general builders' work, there are many for those articles of special manufacture which are in frequent use. These would have been of more value if it had been stated whether the prices given are based upon the “nett” or “list” prices. Doubtless, for trade reasons, there would be some difficulty in obtaining with any definiteness the discounts allowed; but these, as is well known, vary so considerably—sufficient to make an immense difference in the prices to be allowed to the contractor—the want of these particulars somewhat detracts from the value of the information to the architect, for whom, amongst others mentioned on the title page, the work is designed. This remark especially applies to the prices for “Tubes and fittings” on page 362 and following pages, where the difference between “nett” and “list” prices is generally not less than from 65 to 70 per cent.

The somewhat eulogistic descriptions of some few of these special articles might well be omitted, as, in addition to the fact that the work is not intended to be an aid in specifying, there should be no suspicion of advertising out of the regular advertising pages.

The full detailed list of prices for labours on stone, and the very complete chapter on electric lighting, call for special mention. There is a good deal of information given which, while not strictly pertaining to prices, will make the work of value as a book of reference, amongst which the chapter on “Legal Notes and Memoranda” may be mentioned.

The book is, on the whole, well arranged, and contains practically the price of everything that is likely to come under the notice of the surveyor or builder in estimating.

Sprague's Pocket Diary and Architects' and Surveyors' Memorandum Book. London: Sprague & Co. 1898.

This is the annual re-issue of a really pocket-size diary, with space for short memoranda, and to which are attached a good many pages of useful memoranda as to building materials, weight of various substances, sizes for girders and roof timbers, a schedule of breaking loads of iron columns, safe loads on girders and rolled joists, &c., &c.

TRADE CATALOGUES.

MESSRS. COLLEDGE & BRIDGEN (Wolverhampton) send us their catalogue of locks, door furniture, and builders' hardware. A good many of the designs for door-plates, knob-handles, and brass pull handles, deserve attention as being in a better style of design than is generally seen in a miscellaneous catalogue, especially in the case of the brass pulls, though some of these are a little spoiled by cutting the ends of the plates into ornamental shapes; they would be better in a simple form; but there is an evident attention given to design. The “Collins panic door fittings” have a large plate marked “push,” the pushing of which sets free the lock and fastenings generally; this is the best way of providing for opening an emergency door, as it gives a clear and unmistakable direction what to do. Various door checks and spring hinges are included in the catalogue; door bolts of various kinds (the brass hall door bolts and the large malleable iron bolts are good in design), brass sash fasteners and iron and brass casement fasteners, quadrant stays, casement and skylight openers, espagnolette and French window bolts, brass drawer pulls (the simplest designs of these are the best—some of them are over-ornamented), knockers, bell handles and bell-pulls of various types, copper link and steel ribbon sash lines, waste-preventing cisterns, iron and brass pumps, wrought-iron safes, &c. The catalogue is well illustrated, and appears to represent good work throughout.—Messrs. Geo. Wright & Co. send us their illustrated catalogue of grates and stoves, &c. The wood mantels are good; those for iron are too much an imitation of stone or wood patterns; there should be a special character of design for cast-iron work of this kind. The “interior grates” and swing canopy grates are nearly all in a good style, and should have the attention of architects who require grates of this kind out of stock in hand, and the same applies to the basket and dog grates. The catalogue includes also radiators, curbs, fenders, fire-iron rests, &c. There is a long list of ranges of various types, shown in drawings; two forms of independent hot-water boiler (*i.e.*, with its own fire); and a page of “directions for fixing kitcheners,” with illustrative sections. Hot plates, ovens, gas-heated hot-closets, boilers, stable and cowhouse fittings, occupy a considerable portion of the catalogue.—Mr. W. Gooding (Holloway) sends an illustrated description of his “Interchangeable Rubber Stair Treads,” consisting of an iron “keeper” with a number of square-shaped holes through which blocks of rubber are placed, which form the treading surface. When these are worn by the traffic they can be taken out and new ones inserted; or those at the centre, which are generally soonest worn, can be transferred to the sides, and the side ones placed in the centre, so as to get equal wear from all. India-rubber, of course, gives an excellent foothold.—The Hilles & Jones Company (Wilmington, Delaware) send us their catalogue, letter O., containing very well executed illustrations of a number of machine tools for foundry and engineering work on a scale, including punches; punch and shearing machines; a 5-ft. riveting press, with main frame of cast steel; patent bevel shearing machine; plate shears; multiple punches; bending and straightening machines; plate-straightening and plate-bending rolls; planing and milling machines, &c. Each machine is distinguished by a code word for telegraphic orders.—Messrs. Graham & Banks send us their new album of photographs of furniture and complete rooms, which contains a great deal that is admirable in style and make, and it may serve as a good illustration of the improvement which has developed in England in furniture design during the present generation, that such a collection as this appears in the shape of a trade catalogue. Of course there is too much of imitation of ancient styles—“Room in Louis Seize style,” “Room

in François style,” &c.; no doubt the public ask for this kind of thing, but if dealers in the position of Messrs. Graham & Banks chose, they might do a good deal to persuade people that this imitation of furniture and fittings of special ancient dates is not what they ought to want, at all events. The bedroom with white fittings (why use the barbarous word “fittings”?) is the best of the rooms, and the manner in which the bed-canopy, elliptical on plan, is connected with the ceiling cornice, gives an architectural completeness to the whole; the bed seems part of the design of the room. Among the things which we like best in the special furniture plates are the mahogany inlaid furniture (page 17), and some of the dining-room chairs in morocco (page 29), Nos. 155 and 158 especially; with regard to some of the others we may point out that although a cross-rail connecting the ends of the legs close to the floor is very monumental and structural, that rail is a nuisance to the sitter in the chair, and it is better to construct chairs so as to dispense with it. The “Sheraton inlaid furniture” on pages 19 to 21 is excellent, and one could hardly have a better model than Sheraton at his best; but why make what is processional an imitation of Sheraton? Why not try to develop a Graham & Banks' style, for that matter?

BOOKS RECEIVED.

A HISTORY OF ARCHITECTURE: By Professor Banister Fletcher and Banister F. Fletcher. Third edition, revised. (B. T. Batsford.)
THE CATHEDRAL CHURCH OF EXETER. By Percy Addleshaw. (G. Bell & Sons.)
THE YEAR'S ART: 1898. Edited by A. C. R. CARTER. (Virtue & Co.)
DILAPIDATIONS: By A. T. Macer. Second edition. (Estates Gazette office.)
FURNITURE: By Sidney Wright. Second edition. (Estates Gazette office.)
THE GARDENING YEAR BOOK. (Gardener's Magazine Office.)
SPRAGUE'S POCKET DIARY AND ARCHITECTS' AND SURVEYORS' MEMORANDUM BOOK for 1898. (Sprague & Co.)

STUDENTS' PRIZE DRAWINGS AT THE INSTITUTE.

WE shall give a special review of the students' drawings in our next issue; and in the meantime we may say that we shall be very glad to publish, as we have frequently done on former occasions, the successful designs for the various prizes.

Illustrations.

CARDIFF MUNICIPAL BUILDINGS COMPETITION.

WE publish this week the ground plans and elevations of the third premiated design for the Cardiff Town Hall and Law Courts, by Mr. A. W. Cooksey and Mr. A. Cox. We have already commented on the design in the general notice of the drawings in our issue for December 18. The authors send us the following remarks in regard to the objects they kept before them in the design:—

“In the working out of our design we endeavoured to keep as closely as possible to the general conditions. The principal entrances and façades are placed so as to face south and townwards, and each building has been designed so as to express externally its different uses. The principal entrance to the municipal buildings is in the centre of the façade, and those to the general offices on either side by a loggia into the central courtyard. This gets over the difficulty of lighting through the deep part of the ground floor under the reception-rooms.

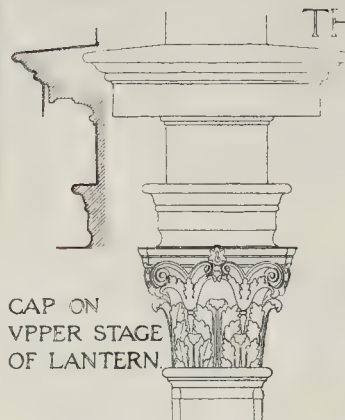
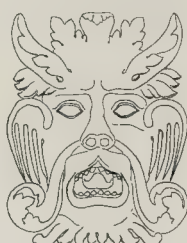
The reception-rooms are arranged *en suite*, and occupy the whole of the south frontage on the first floor, together with the mayor's parlour and deputy mayor's room.

The law and police courts are all on the ground floor. The Assize courts are approached by the principal entrance in the centre of the south front, and the police courts from the North-road.

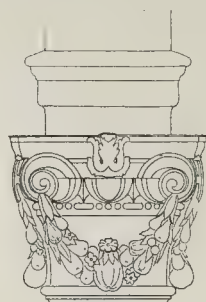
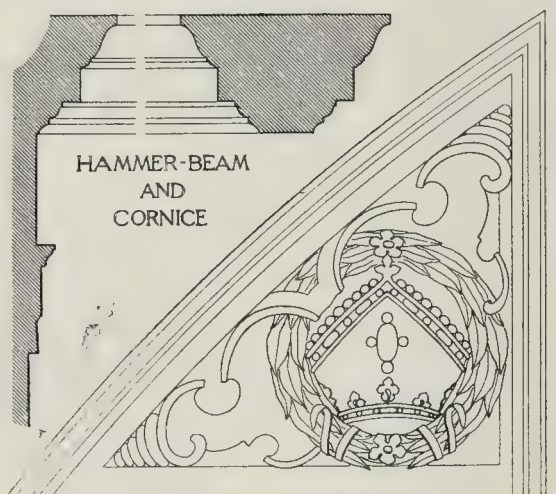
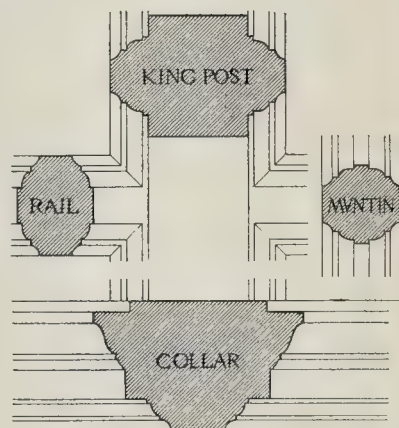
The police station is on the north side of the courts, and is entered directly from the North-road.

The judges' and magistrates', and also the solicitors' and barristers', private entrances are from the Avenue.

THE LIBRARY LAMBETH PALACE

CAP ON
UPPER STAGE
OF LANTERN.

A MASK INSIDE LANTERN

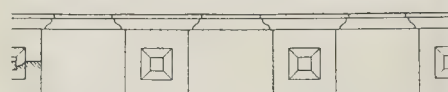
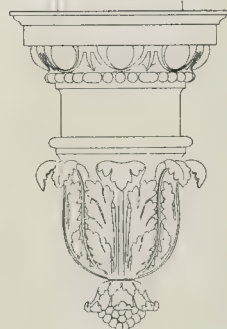
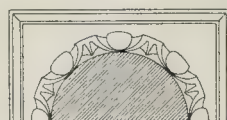
CAP ON
LOWER
STAGE.HAMMER-BEAM
AND
CORNICE

KING POST

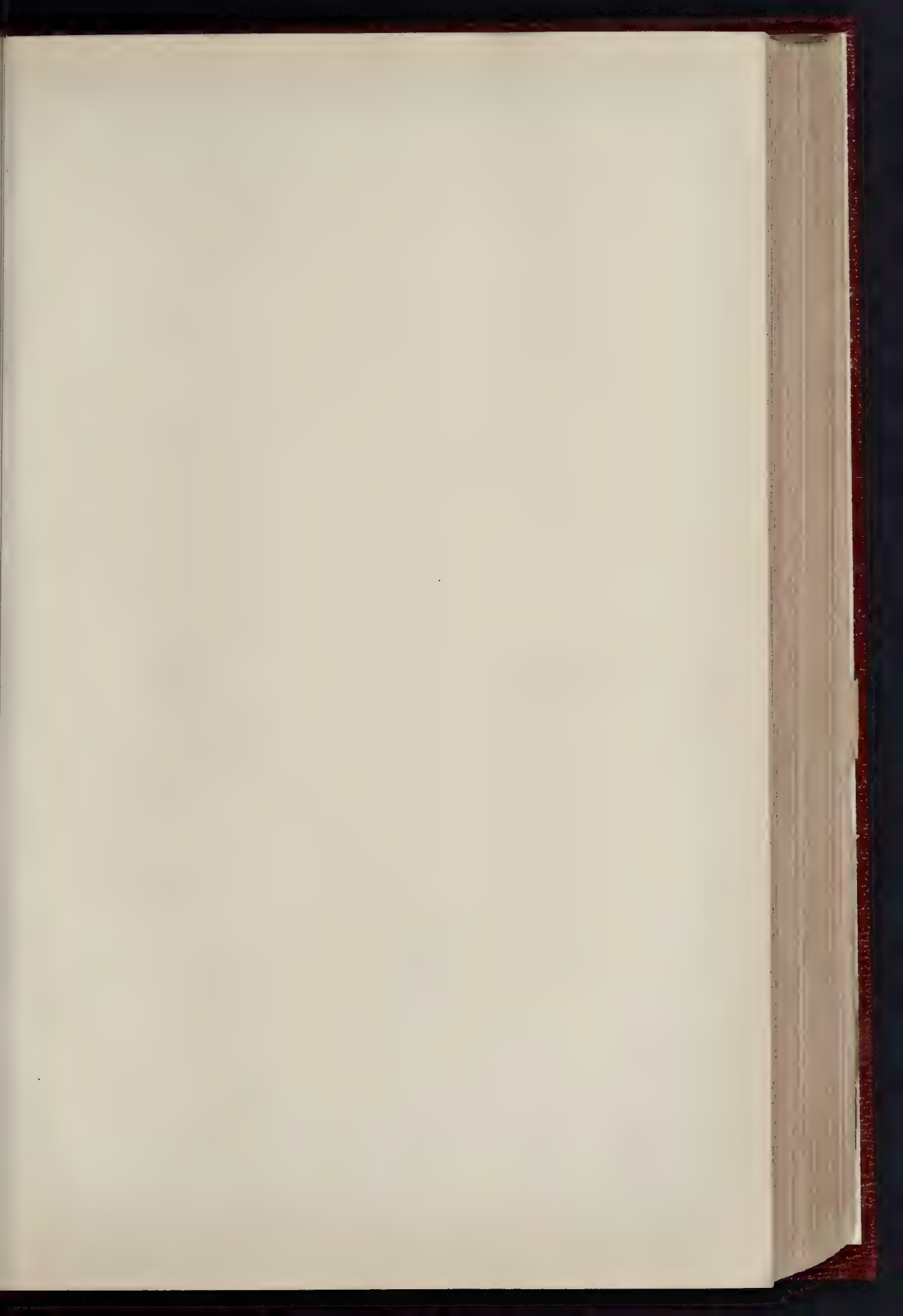
RAIL

MANTIN

COLLAR

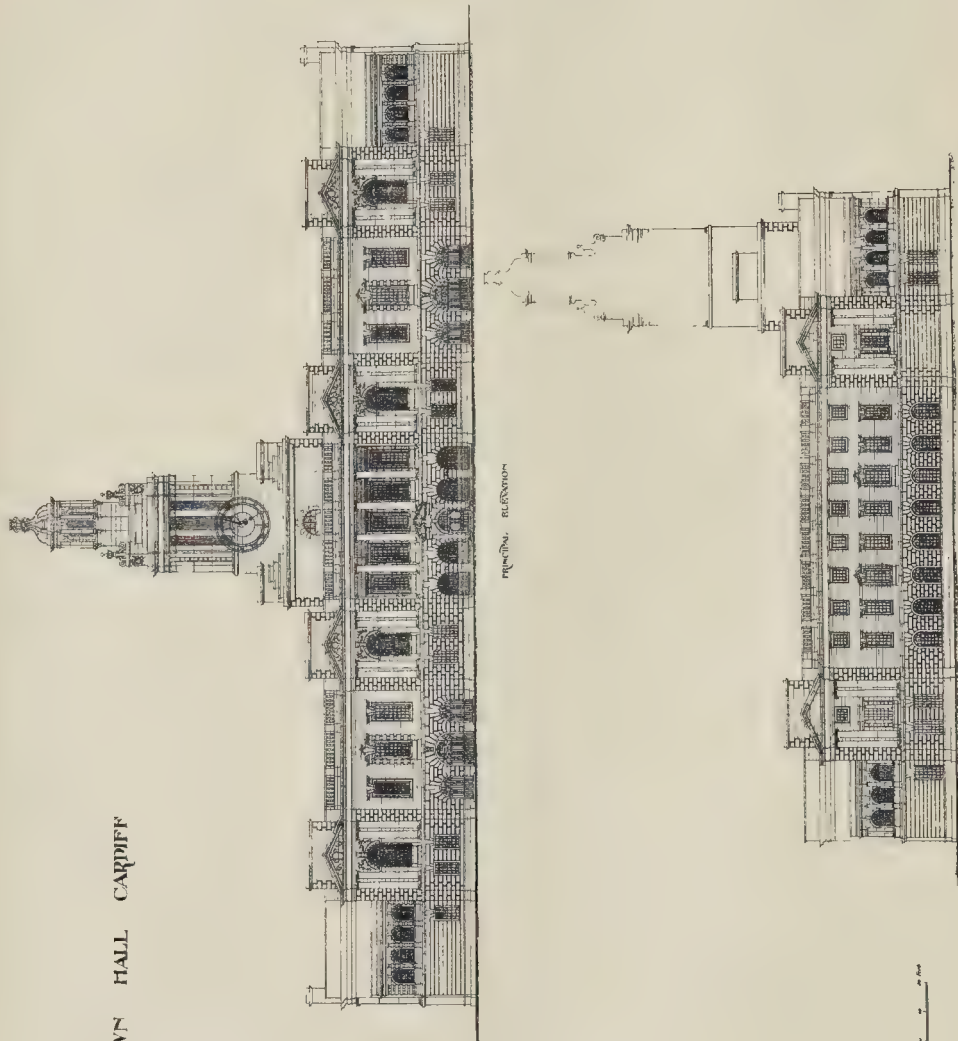
MAIN
CORNICE
AND
FRIEZE

SCALE OF FEET



THE BUILDER, JANUARY 15, 1898

NEW TOWN HALL CARDIFF



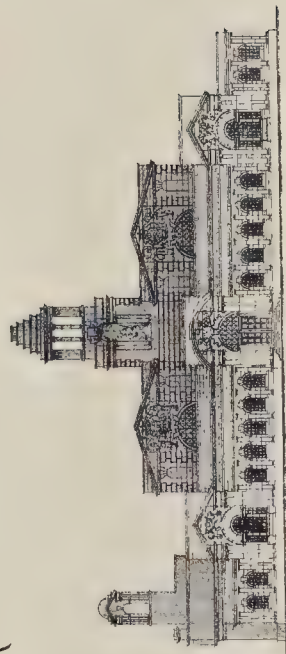
FRONT ELEVATION

ELEVATION IN MIND

PHOTOGRAPH SPRINGER C. 485 EAST HARDING STREET PITTSBURGH PA. U.S.A.

CARDIFF TOWN HALL AND LAW COURTS COMPETITION: THIRD PREMIAED DESIGN

NEW LAW COURTS ETC. CARDIFF



CENTRAL ELEVATION

PHOTO-LITHO SPRAGUE & CO. 485, EAST HADFIELD STREET, LONDON, E.C.

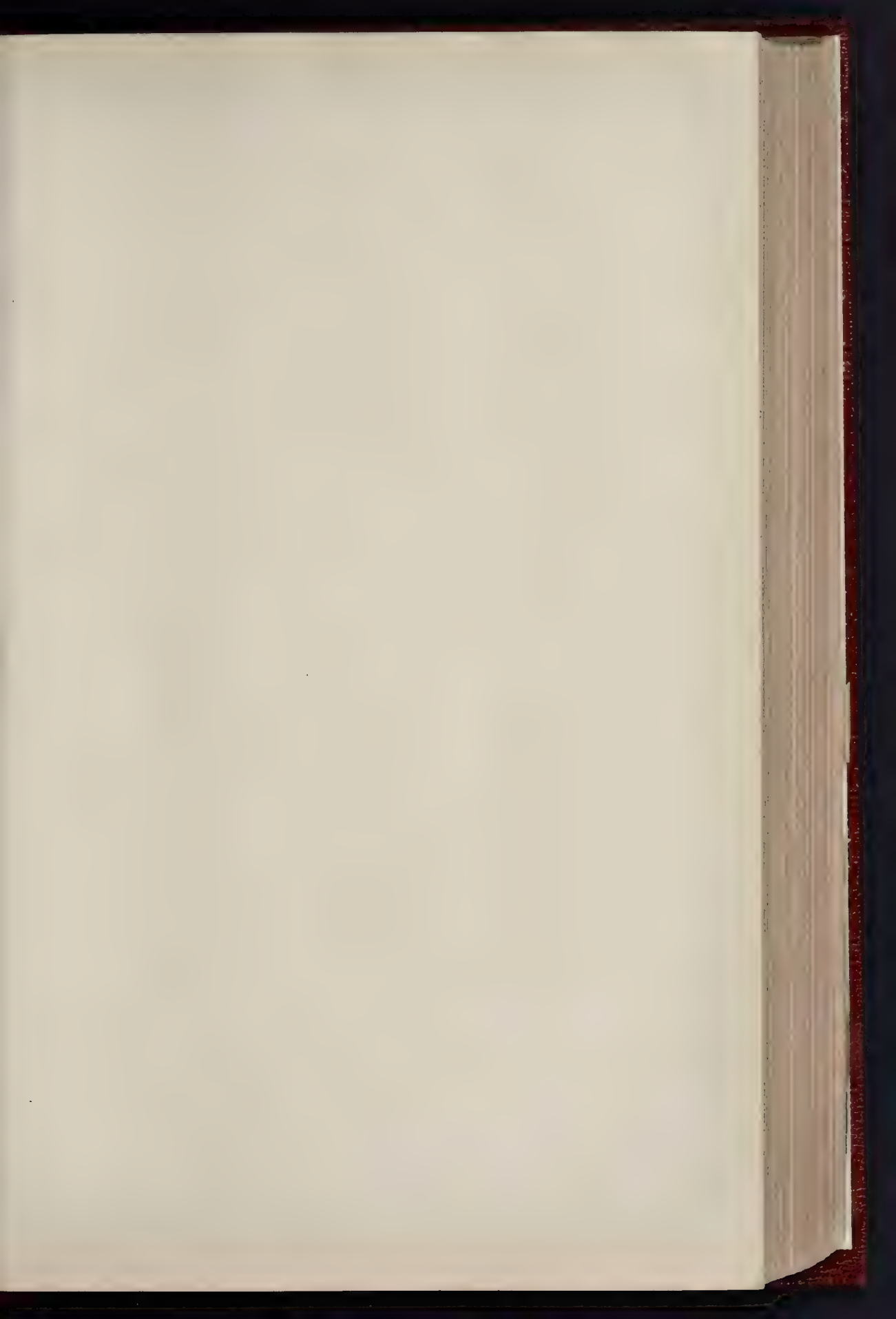


NORTH RIVER ELEVATION

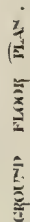
Scale of Feet
0 10 20 30 40 50 60 70 80 90 100

CARDIFF TOWN HALL AND LAW COURTS COMPETITION. THIRD PREMIAED DESIGN.

BY MR. A. W. COORSEY, A.R.I.B.A., AND MR. A. COX



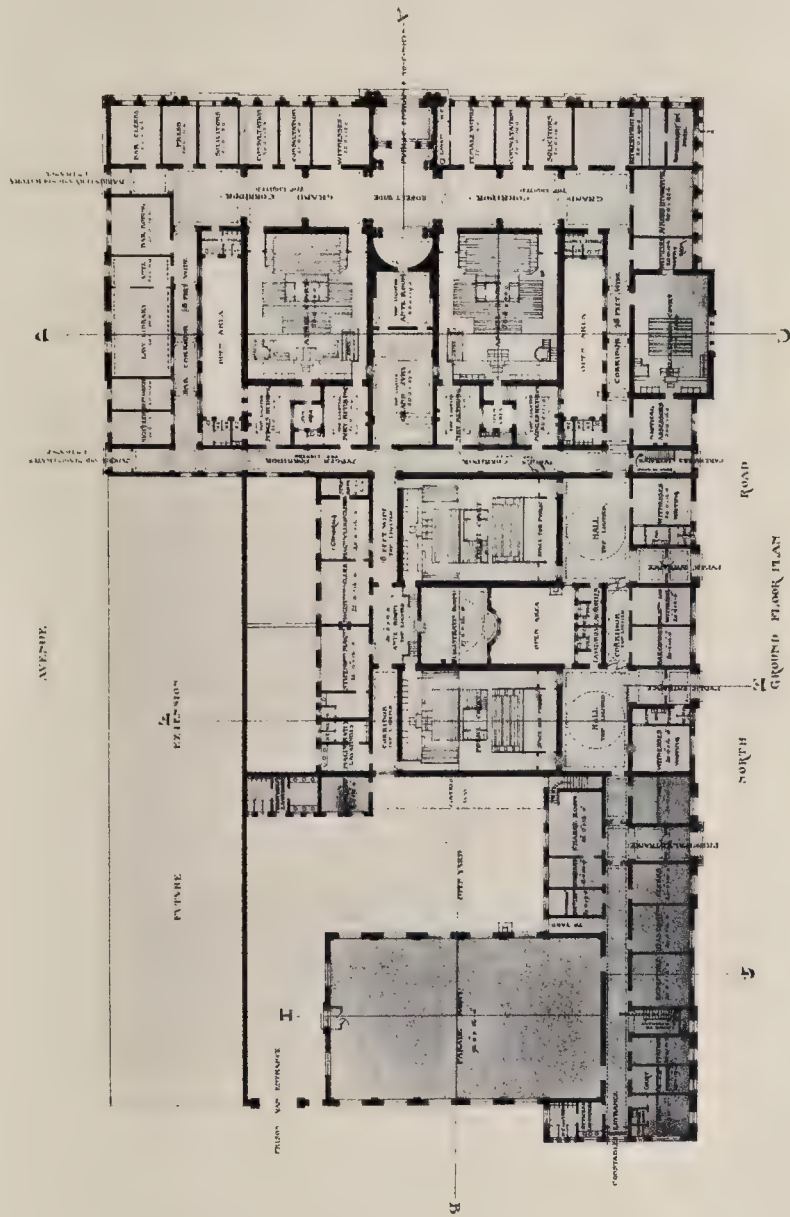
NEW TOWN HALL CARDIFF



AND PROPOSED TO GO TO A "FREE LETTER" MEETING

CARDIFF TOWN HALL AND LAW COURTS COMPETITION: THIRD PREMATED DESIGN.
By MR. A. W. COORSEY, A.R.I.B.A., AND MR. A. COX

NEW LAW COURTS ETC CARDIFF



IN PHOTOGRAPHIC COPY OF LAST EDITION, IN REVISION LINE 1.

CARDIFF TOWN HALL AND LAW COURTS COMPETITION. THIRD PREMIAED DESIGN
By MR A W COOSEY, A.R.B.A., AND MR A COX



THE LIBRARY
LAMBETH PALACE.

Scale of 0 5 10 15 20 feet

DETAIL OF CENTRAL BAY.

MEASURED & DRAWN BY

M^R A M WATSON



PHOTOGRAPHED BY SPRAGUE & CO. 485 EAST HARDING STREET FETTER LANE E.C.

THE LIBRARY LAMBETH PALACE.

MEASURED & DRAWN BY MR A M WATSON



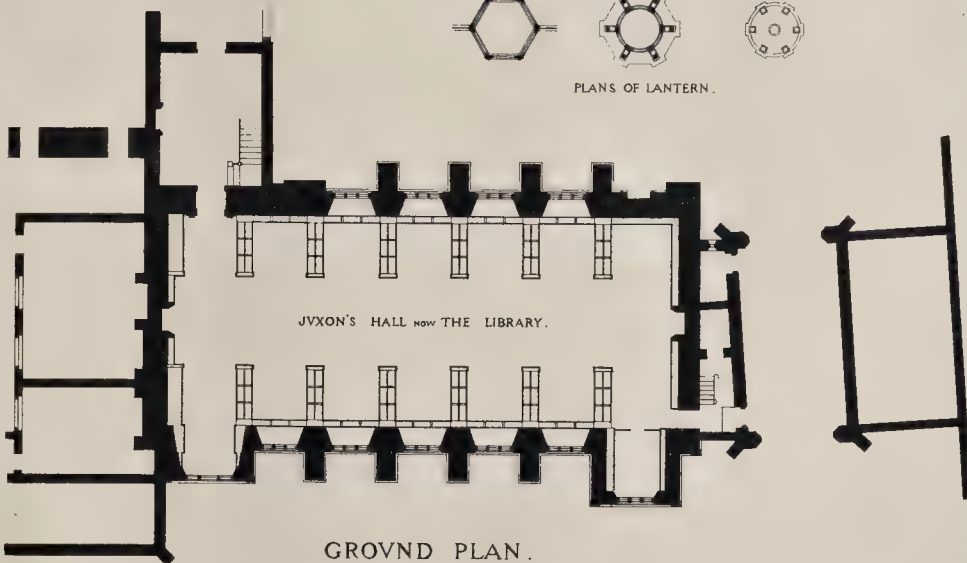
THE RIVER FRONT.



SECTION.

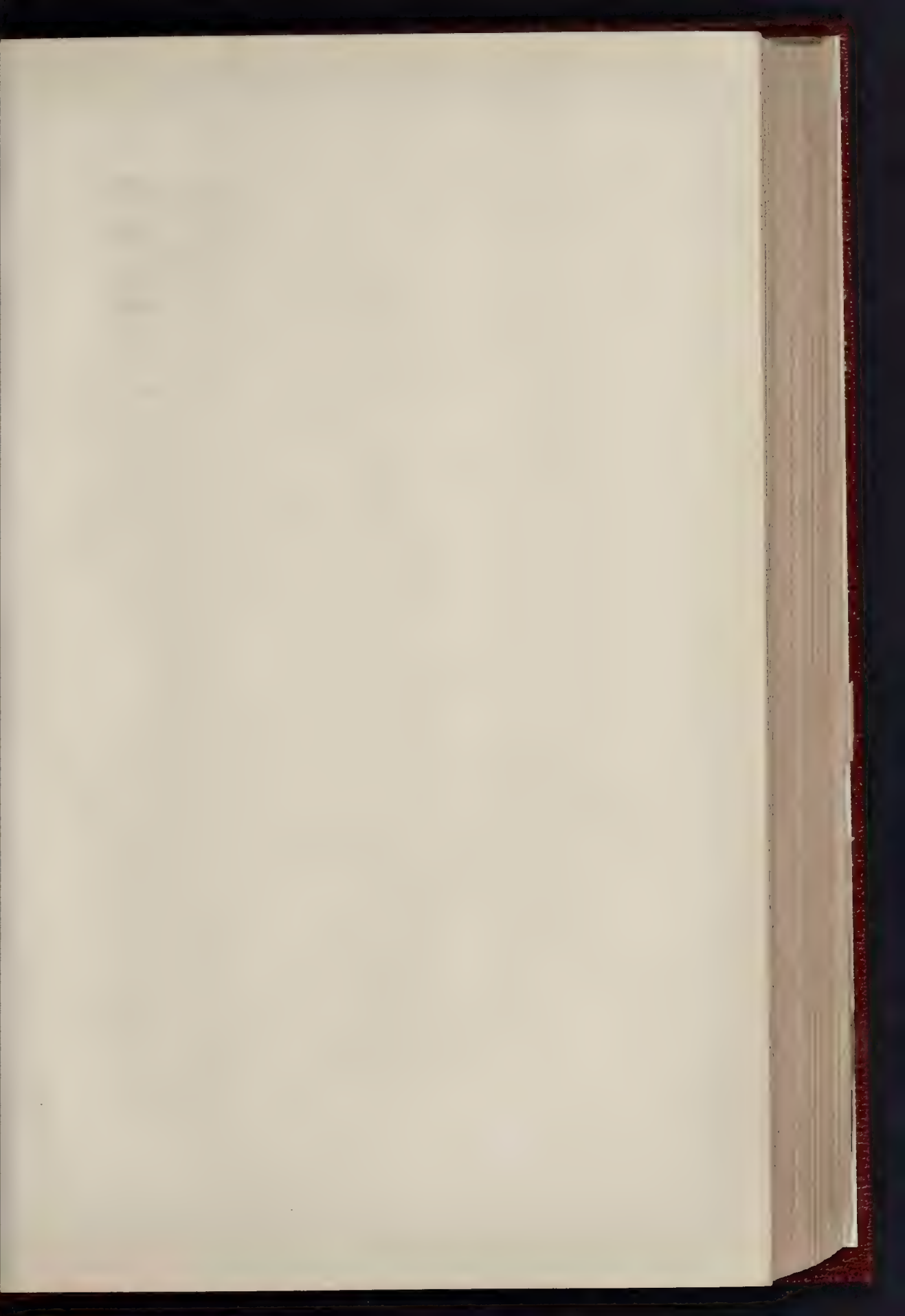


PLANS OF LANTERN.



GROUND PLAN.

Scale of 0 10 20 30 40 50 60 70 80 90 feet



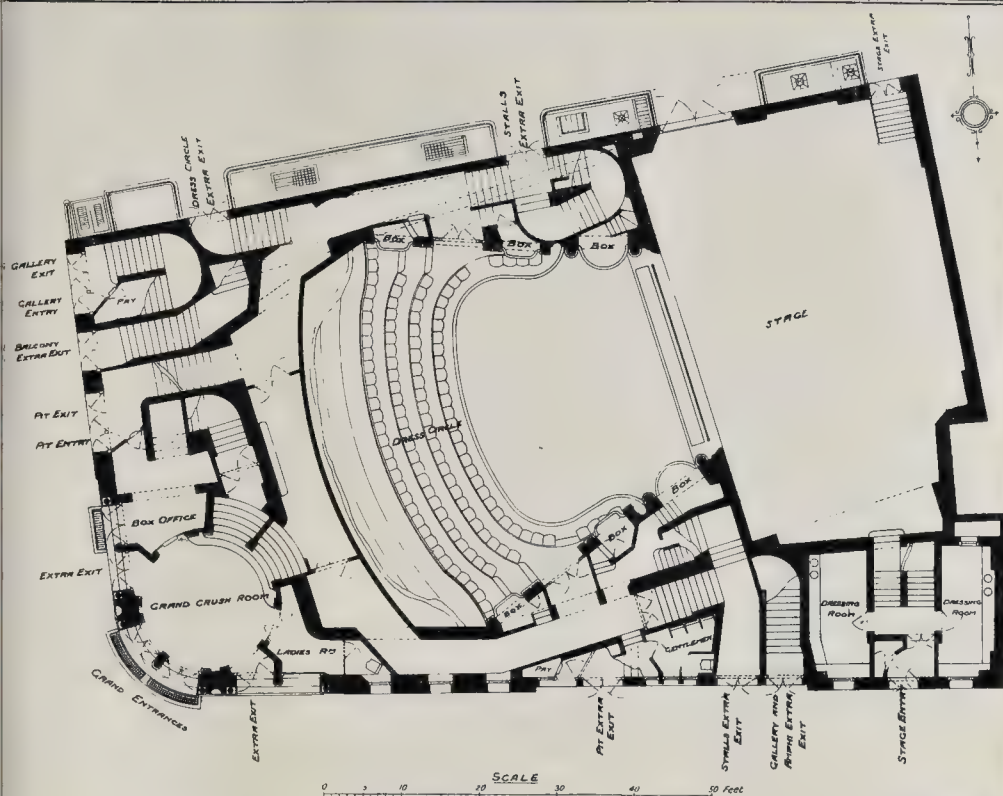
THE BUILDER, JANUARY 15, 1898



THE "CORONET" THEATRE, NOTTING HILL.—MR. W. G. R. SPENCER, ARCHT.



THE HEDGEHOG Breville
INN & BALY
CV AL ST ARCHES
NOTTINGHAM



The "Coronet" Theatre, Notting Hill. Plan.

[See next page.]

An endeavour has been made to give solidity and dignity to the elevations, and small treatment has been avoided."

THE LIBRARY, LAMBETH PALACE.

THE measured drawings of Lambeth Palace library, published in this number, are made by Mr. A. M. Watson, and are those for which, already mentioned in our columns, the Royal Academy Silver Medal for measured drawings of a building was awarded. A few notes on the history of the building may not be out of place.

Passing through John Morton's great gateway, on the old road from Westminster by the ferry to Southwark, we see that the Hall occupies nearly all the east side of the outer court of the Palace, or, more correctly, House. When appointed to Lambeth, William Juxon (1600-3) found it fairly in ruins. Parliament had sold the buildings; Colonel Thomas Scott, a regicide, one of the purchasers, had pulled down, in 1642, the original hall, cited in the Reynolds' accounts of Walter Reginald or teward (1313-27), and, more precisely, of Henry Chicheley (1414-43). That hall, repaired by Chicheley, and covered with shingle by Matthew Parker in 1570-1, is considered by many to have formed part of the buildings erected by Boniface of Savoy (1241-70). Juxon once set about its reconstruction on the same site, and mainly after the same "model," as he says in his will, "nor could all the persuasions of men versed in architecture, and of his friends," writes Ducarel, "induce him to rebuild it in the modern way." It cost him £5,500. Meanwhile Richard Bancroft (1604-10) had devised "all my books in my study over the cloisters, unto my successors . . . forever," under certain conditions framed by Francis Bacon for his successor, George Abbott (1611-33) to guard against their alienation, with reversion to Cambridge University.

* See the "Computus Ballivorum," 15 Edward II. and Henry VI.; Lambeth MSS., 1193.

In 1646, the See being then vacant after Laud's execution, the books were seized by Parliament and given to Sion College and private individuals—amongst the latter being John Thurloe and Hugh Peters. On Selden's interposition the books were collected (1647) and carried to Cambridge. Restored by the University during Gilbert Sheldon's time (1663-77), they were housed in a quadrangular gallery designed, Aubrey relates, for Sheldon by Stafford Tyndale, above the Great Cloister; since altered to make way for Howley's structural changes. Bancroft's executors bought Whitgift's books, and the library was subsequently increased with those of Abbot, Laud, Sheldon, Secker, and others. The first librarian was Henry Wharton, who, in his short life, served Sancroft, Tillotson, and Tenison in that capacity.*

To William Howley, appointed in 1828, may also be aptly given a title bestowed upon his predecessor Morton, "the building Archbishop." When Regius Professor of Divinity at Oxford he re-built the professor's house there; as Bishop of London he built the town house in St. James's-square; and made extensive restorations at Fulham. At Lambeth he employed Blore, and spent £60,000. (one-half of that sum out of his own purse) in erecting the block of private apartments, with gateway, &c., in restoring and repairing the chapel and other old buildings, and in adapting the Great Hall for purposes of the library, with a spacious fire-proof room in the new gateway, for the MSS. The door of the hall was in the nearer bay or wing—this was removed by lowering the window to correspond with that in the further bay, and a new entrance was made from the gateway. On the vane of the hexagonal lantern are a mitre and the arms of the See per pale with those of Juxon—or a cross gules between four black-boy's heads proper. On the gutter beneath the cornice is

* Amongst his successors were E. Gibson (Bishop of London in 1723); Dr. A. C. Ducarel, the historian of Lambeth; Rev. S. R. Maitland, and Dr. Wm. Stubbs (1862-7), Bishop of Oxford.

the same coat with the date, "1663." The stained and painted panes, for the most part brought from other apartments, include the coats-arms of several archbishops, and a portrait of Chicheley; at either end are panels with the arms of the See impaled with those of Bancroft—or on a bend azure 3 garbs of the first between 6 cross crosslets of the second—and Secker—*gules* a bend engrailed between 2 bull's-heads erased *or*. The tables are those of the old dining-hall. Of the library it will suffice to say here that it comprises a valuable and, in some respects, unrivalled collection, of the greatest interest to all students alike; whilst the registers, beginning with those of John Peckham (1270-92), form a unique series embracing, with but two gaps, a long record of our country's ecclesiastical story.

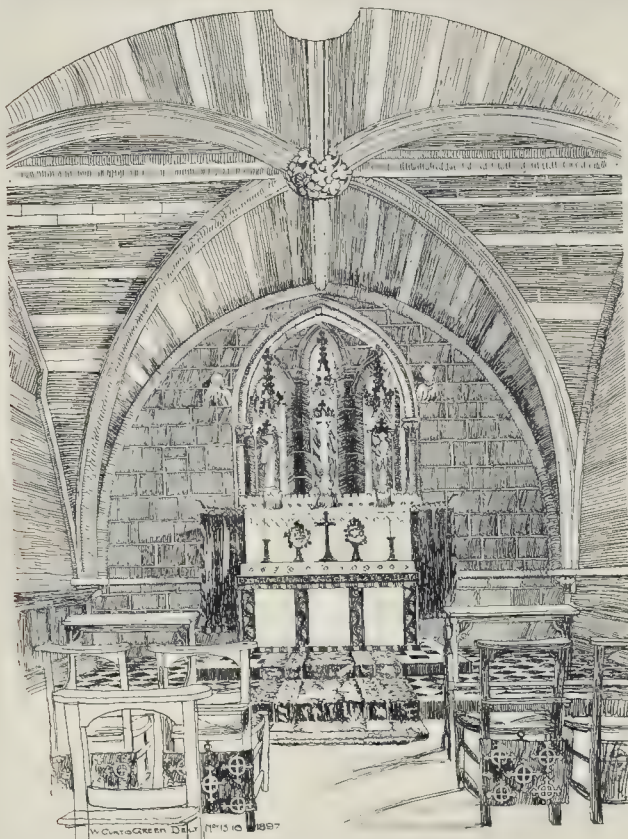
In regard to the architectural aspect and construction of the building Mr. Watson gives the following notes:—"The internal dimensions of the library are 38 ft. by 92 ft. 9 in. by 50 ft. high from the floor to the under side of longitudinal moulded rib against which the curved ceiling finishes. A space of 6 ft. 6 in. separates this inner ceiling from the ridge.

The lantern rises 16 ft. 8 in. from ridge to cornice of upper stage, and the mitre which crowns the vane is at 92 ft. from the ground. The vane measures 9 ft. long.

The lantern is entirely covered with lead, with the exception of the twelve carved oak capitals, which are painted; two only of the original capitals remain intact, the other ten are good restorations. The slate roof is modern.

The walls, which are 4 ft. 6 in. thick, plastered in the inside, are faced with red brick and Portland stone. The quoins stones are 12 in. deep, and the brick courses run nine courses=2 feet.

The entrance used to be through the projecting S.W. bay on the right (see River Front), the present window was inserted when the librarian's room was placed in this bay; the original doorway has been removed, and is built up in the opposite (E) wall."



St. Chad's Chapel, Lichfield Cathedral: as restored.

"CORONET" THEATRE, NOTTING HILL.

THE new "Coronet" Theatre, Notting Hill Gate, stands upon an almost isolated site, having frontages to the High-street, Johnson-street, and Uxbridge-street. The main elevations are treated in a free Italian Renaissance style. The interior throughout will be luxuriously decorated in Louis XVI. style.

The theatre is designed on the two-tier system, namely, pit, pit stalls, and orchestra stalls on the lowest level; dress circle and balcony forming the first tier, and gallery and amphitheatre comprising the second tier. The balcony, though forming part of the first tier, is slightly raised, giving somewhat the effect of a three-tier house, but avoiding the steep steepings so usual in the latter case. An uninterrupted view of the stage will be obtained in every part of the auditorium.

The theatre will be electrically lit throughout, and the light arranged so as to add to the general effect of the details of the decorations. A complete gas installation is also to be provided, in case of temporary failure of the electric light.

Hydrants, of fire-brigade pattern, are provided at different points, and a double asbestos and steel-framed fireproof curtain, which can be worked by one operator, divides the stage from the auditorium, with a powerful water spray to play upon same. The building will be heated on the low-pressure system, including the dressing-rooms, which latter will have hot and cold water supplies, &c. Ventilation has been carefully studied, and powerful exhausts are provided above the auditorium, roofs, &c. The building throughout, except the stage, is entirely of fireproof construction, and the tiers are supported entirely without the aid of columns.

The cost will be about 25,000*l.* complete, and it is expected the theatre will be ready for opening next October. Mr. W. G. R. Sprague is the architect.

HEDGEHOG INN, NOTTINGHAM.

THIS building is being erected on the site of the old inn, a cramped site at the corner of Canal and New Bridge-streets, in the old part of Nottingham.

The material being used is red sand bricks with stone dressings and red roof tiles.

The architects are Messrs. Brewill & Bailly, of Nottingham. The drawing was exhibited at the last Royal Academy.

ST. CHAD'S CHAPEL, LICHFIELD CATHEDRAL.

THE chapel of St. Chad, first bishop of Lichfield and patron saint of the cathedral, was destroyed when the rest of the cathedral was laid in ruins in the middle of the seventeenth century. There remained, however, indications of its former state sufficient to make the present restoration of great interest; the vaulting shafts and capitals for the springers of the stone groining, the wall ribs themselves, the beautiful Early English windows, twelve lancets in groups of three, are parts of the original chapel. The site of the old altar is clearly marked, and part of it is preserved, and there are also some very old pieces of sculpture still left. The restoration has been made under the direction of Mr. J. Oldrid Scott. The reredos—of Staffordshire alabaster—was designed by Mr. C. E. Kemp. All the windows are filled with stained glass. The new bosses and corbels are carved with subjects from the history of St. Chad. The canopied niches of

the reredos contain figures representing the Crucifixion, St. Mary, and St. John. The restoration has been made at the expense of the present Dean. The chapel was formally opened on St. Chad's Day, 1897.

The sketch gives no idea of the peeps of coloured glass in the lancet windows behind the reredos; the effect the light produces in this tiny vaulted chapel, with its rich windows and their detached shafts, is delightful. It seems a pity that the moulding of the ribs of the new vaulting should be in a later style than the preserved portions of the old building.

Correspondence.

To the Editor of THE BUILDER.

CARDIFF LAW COURTS, &c.

SIR,—May I point out (what has not yet, I think, been noted by any of the critics), that the many and great practical merits of the successful design are got, so far as the law building is concerned, by entirely ignoring one of the most important and peremptory of the conditions? In the copy before me it is twice over emphatically stated that the police department is to be attached to the law courts, but to the north of them—once in clause 3 (page 1), and again by quotation of a resolution of the Town Council (top of page 7). In the design placed first, the police department is in one block with the other, occupying all four frontages on the ground floor, and the whole of the west and part of the south on the first floor. To place this plan first, instead of rejecting it as contrary to the conditions, may be acceptable to the Town Council, whose resolution is ignored, but it is certainly most unjust to the other competitors, who obeyed and were fettered by the condition. So at least it seems to AN IMPARTIAL OUTSIDER.

* * The discrepancy is more apparent than real. If the courts had all been on the ground floor, no doubt the competitors were under orders to keep the police courts to the north. But the authors of the first premiated design adopted the system of putting the assize courts on the upper floor, leaving the greater part of the ground floor space at liberty for the police courts and their accessories. Now there was not a word in the instructions requiring that the courts should all be on one floor—any of the other competitors could have followed the same course without infringing the instructions.—Ed.

BATTERSEA BATH COMPETITION.

SIR,—In criticising the plans of the above in your issue of Saturday last, you apparently do me too much honour in stating that I had gained the second position in the competition; whereas, as a matter of fact, I was awarded the third premium only.

Although severe comment has been made upon the unsatisfactory conduct of this competition by the professional press generally, I myself refrain, for obvious reasons, from making any observations, excepting that, in the interest of the unsuccessful competitors generally, it is greatly to be regretted that the whole of the designs were not exhibited.

A. HESSELL TILTMAN.

THE RIGHT TO SKETCH IN CHURCHES.

SIR,—I believe there exists a general impression among sketchers that any one has an absolute right to enter a church, and that it is not really necessary to ask permission of the incumbent to measure or sketch.

I know this permission is frequently sought as a matter of courtesy, but with the idea that the clergy have no legal right of refusal. Too often, I fear, this simple act of politeness is omitted, on the assumption that the right to enter upon and sketch or measure is an inherited privilege to a British subject. This is not so; and for several reasons, which I will not inflict on your readers, I venture to think this erroneous notion (in which I confess I have hitherto shared) should be dissipated.

In "The Book of Church Law," by the Rev. T. H. Blunt, M.A., F.S.A., revised by Walter G. F. Phillimore, D.C.L., I find the following—

"By his induction into the real and corporal possession of his benefice in general, a rector or vicar becomes invested, in particular, with freehold rights in all the land and buildings which are enclosed within the churchyard wall or fence. The site and fabric of the church, with all that is permanently attached to the fabric are thus, in the eye of the law, the property of the incumbent for the time being. . . . The right, thus being, . . . the exclusive right of access to the church, and also (saving any established right of way) to the churchyard, so that none can lawfully exclude him from any part of them, nor any enter them of their own right, but only by his permission, so long as he is incumbent." (Book V., Chap. II., § 2).

The italics are mine.

From this it appears that no parishioner even has the right *per se* to enter the church at any time, and that permission is required, legally, to make a sketch of the exterior of a church, if it is necessary to encroach on church property.

It is not likely that the clergy will stand strictly on their legal rights, but perhaps the knowledge at they can do so, may be useful to some who use their privileges, and for whose ignorance or pughtlessness others have to suffer.

A. NEEDHAM WILSON, A.R.I.B.A.

HOUSE DECORATION.

SIR,—In answer to Mr. J. D. Crace's letter in your issue of the 1st inst., I wish to point out that I commended deferring the finishing of the decoration of a house for a season or two, by which the walls would have had time to dry. Where painting has to be executed quickly, it is a common practice to build the brickwork with Portland cement, and finish the plastering with Parian or some other cement, which is generally painted at once, but this on a wall which has not had time to dry, is, to say the least, risky; but I am disposed to think that the efflorescence referred to is caused by Portland cement having been used for the rendering or with the brickwork. The safest plan, no doubt, where space and expense need not be considered, is to batten the walls and lath, if time cannot be allowed for the walls to dry. I am not prepared to express an opinion on the rival theories of whether red, blue, and yellow, or red, blue, and green should be considered the primary colours, as expounded in the works of Chevreul and Professor Church, and my recommendation to students to read Chevreul, with the caution from Mr. Crace, may fairly stand.

L. A. SHUFFREY.

* * * The above was sent for publication last week, but arrived too late.—ED.

QUESTIONS IN QUANTITIES.

SIR,—Upon perusing the article on "Quantities and Quantity Taking" in your issue for September 14, I notice only 3 in. is allowed on each side for cutting tiles to hips and valleys.

I have measured up a quantity of tiling with London tiles, and they have always demanded 6 in. each side, and for all other cuttings also. Should cutting be allowed at verges, both in slater and tiler, and also allow for tile and half?

Should cutting be allowed at ends of roof next gable, or as slater not allowed?

In the article for November 20 it gives K. P. s. and

4 on woodwork and 4. Does 4 mean four-foot work, and is the 4 for edges?

In measuring linings, window boards, &c., should tongue be measured, or only that which is seen? STUDENT.

* * * Three inches is the usual allowance by surveyors for cuttings on each side of hips and valleys and also around deductions, and it has been the practice of the writer to allow only this width, although some tiers claim 6 in.

Cutting should not be allowed for verges, neither at the ends of a roof next gables.

K. P. s. and 4 means knot prime stop and paint four additional coats with an allowance for edges covered by the addition of 4 in. In measuring linings, window boards, &c., should be measured the full width, i.e., including the tongue.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—III.

IT is desirable that the student should have a clear understanding of the meaning of the terms that are used in treating of any subject and particularly such a subject as strength of materials; we will, therefore, proceed to explain some of the most usual terms. The principal strains with which a student will have to deal are compression, tension, transverse or cross strain, shearing, and torsion. Of these the simplest is compression, which is probably understood already, but the student must remember that in order to produce strain in a piece of material the forces exerted in the compression are equal and opposite at different parts or ends of the structure. In the case of a column, for example, the strain is produced not only by the load which rests on the column, but by that of the reaction of the base and support on which the column stands. Thus, if there be a load weighing five tons supported by the column, there must be sufficient resistance in the base or support to prevent that five tons causing movement of the column. If there were no resistance or reaction the column, of course, would move, and continue to move as long as the load were upon it. It is only the presence of the reaction or resistance of the support that forms the stress and produces the strain. But the student must be careful not to suppose that because the reaction

is equal to the load in this case, that therefore there is a stress of twice five tons applied to the column, the stress is that of five tons only. Compression then is the strain to which matter is subjected when it is pressed upon by two equal and opposite forces whose direction is towards each other.

Tension is the exact opposite to compression. Again we have equal and opposite forces, but the direction of the forces is away from each other, instead of as in compression. Tension, in short, is the result of a pull in opposite directions of equal and opposite forces. But, again, the tension is not twice that of each of the forces, but equal only to the amount of each force.

Cross or transverse strain is a more complicated matter. The first effect of a cross strain is to bend the piece of material subjected to it. In this bending the lower part of the structure has a tendency to stretch and to be elongated. The upper part has a tendency to become compressed; hence in a beam under cross strain the upper part of the beam is in compression, the lower part in tension. The greatest compression is at the top of the beam, the greatest tension at the lowest part of the beam, and as one proceeds from the top of the beam towards the centre the compression is gradually decreasing, and as one proceeds from the bottom of the beam towards the centre the tension is gradually decreasing until at some point or line between the top and bottom both compression and tension will be at their minimum; this line is called the neutral axis, along which it is generally supposed that there is neither compression nor tension. Here we have an explanation of the reason why iron and steel girders are usually made with the great bulk of the material at the top and bottom, that is in the flanges; for in this position it is most effective in resisting either the compressive strain in the upper part of the beam, or the tensile strain in the lower part of the beam.

The strain known as shearing is one to which beams are commonly subject, as well as to cross strain; but it must be clearly understood that the nature of the two is quite distinct. In shearing strain the particles of material may be said to have a tendency to separation by sliding against each other. Thus, if we assume that a beam or girder is so rigid as not to bend under the load placed upon it, it is nevertheless subjected to a shearing strain which may cause part of the beam to drop, leaving the other on the supports. This, of course, is most likely to occur at the points of support of the beam, and shearing strain in a beam is, therefore, greatest at the points of support, whilst transverse, or cross strain, is usually greatest at or near the centre of the beam.

The last of the five strains we have mentioned—torsion—is one not very frequently under the cognisance of the architect. It occurs far more frequently in machinery of all kinds where a mass of material is rotating by power applied at some point in its length, as, for example, in the case of shafting. The same kind of strain occurs in the case of a screw. It sometimes happens that a carpenter in driving a weak screw into hard wood may twist off the head; the nature of the stress which has produced that disruption is torsional.

The five strains, therefore, which we have brought to the notice of the student may be thus summarised:—

Compression—The result of pressure.
Tension—The result of pulling.
Cross Strain—The result of bending.
Shearing—The result of sliding.
Torsion—The result of twisting.

In designing structures to resist stress, the student must be careful to remember one characteristic which all material possesses when exposed to stress—the characteristic of deteriorating in strength under a continued stress. This is called by the appropriate name fatigue of material; and is closely analogous to the fatigue of muscle in the human frame. We are all conscious that a certain amount of muscular effort well within our compass will, if continued unduly, cause fatigue, prostration, and even death. So it is with material, the load which can be carried by a beam for a day, a month, or a year, will be quite sufficient to cause fracture if continued for many days, months, or years. A deterioration and loss of strength in material is experienced under the stress, just as fatigue is the result of long-con-

tinued activity of any particular muscle or set of muscles. Like muscle, also, material has the faculty of recuperation by rest and removal of stress. This faculty is closely connected with the elasticity of the material or its power of returning to its original strength and form. The operation of the elasticity of material is most noticeable when a piece of construction having been under the experience of a strain has that strain removed; as, for example, a beam may have been loaded to such an extent as to cause a visible bending or deflection. If the load is removed one of two things will follow—the beam will either, by virtue of its elasticity, return again to its original line, or it will remain deflected. In this latter case it is said to have received a permanent set, which is the result of the stress being too great for the elasticity of the material to enable it to recover. It may be taken as universally true, that when a piece of material or construction is subjected to a strain sufficient to cause a permanent set, that the strain is the occasion of considerable fatigue in the material, and will ultimately cause its collapse. As a practical result of the possibility of injurious fatigue of material, it has always been the practice amongst those who build soundly, with a view to the durability of their erections, not to load any part of their structure with more than a small proportion of the weight that would cause fracture. The figure expressing this proportion is termed the "factor of safety."

There is yet another reason why material and structures are never loaded by careful builders to more than a small proportion of their breaking strain; that is, the lack of homogeneity in material. In this quality natural materials, such as stone and timber, are more lacking than manufactured materials, such as iron and steel. By careful manipulation, a very fair approach to uniformity of strength can be obtained in manufactured articles, but this is quite impossible with the natural materials, and even the most careful selection is not sufficient to obviate the natural tendency. This fact explains the reason why it is a very common practice, in using beams of wood of considerable size, to cut them down the centre, reverse the pieces, and bolt them together again, a proceeding which experience has shown to add considerably to the reliability of the beam.

Another point which is to be taken into consideration in determining the factor of safety is the nature of the load, a distinction being made between what is called live load and dead load: in the latter, stress is uniform and continuous; in the former, it is, on the other hand, intermittent and irregular; consequently an effect of shock is produced on the structure, and—another analogy between muscle and material—just as shock decreases the vitality of the human frame, so shock decreases the vitality of material. If a student bears in mind these points we have been explaining he will understand why the following factors of safety are usually employed:—

Cast iron, dead load	$\frac{1}{4}$	of breaking load.
Cast iron, live load	$\frac{1}{2}$	" "
Wrought iron } dead load $\frac{1}{3}$	" "	" "
and steel ... } live load $\frac{1}{2}$	" "	" "
Timber, dead load	$\frac{1}{4}$	" "
Timber, live load	$\frac{1}{2}$	" "
Brickwork and } dead load $\frac{1}{10}$	" "	" "
masonry ... } live load $\frac{1}{20}$	" "	" "

The student will remember that in making use of the formula for the transverse strength of timber beams, when we were calculating the necessary scantling to carry a given load, we assumed a proportion between the breadth and depth. From experiments which have been made, it has been found that the most advantageous relation between the breadth and depth is when breadth is to depth as 5 to 7 or 2 to 3. These proportions experimentally arrived at take account of the possibility of the beam failing by lateral bending. If there were no fear of such lateral bending, it is clear from the formula, and the experiments which have led to the formula, that the best section of a beam would be one infinitely deep in relation to its breadth. And this view of the case is the reason why in the construction of our modern wooden floors we are accustomed to make our joists very thin and deep, because the joists being comparatively close together it is possible to prevent in a very great degree a lateral bending by means of strutting, either herring-bone or solid. So that joists, if efficiently strutted, need scarcely be made thicker than is sufficient to hold the nails. In

making calculations, therefore, for the scantling of floor joists which can be properly strutted, the student should not take the proportion used in the case of beams, but assume the breadth at its minimum thickness of from 2 in. to 3 in., and then calculate the necessary depth for the load. In making calculations for the strength of floors, it is customary to take the following figures as representing their load, including the weight of the floor:—

For dwelling-houses, 1 cwt. per foot super;
For public buildings, 1½ cwt. per foot super;
For warehouses, from 1½ to 2½ cwt. per foot super;

beyond which latter figures it is quite the exception to find any loads, although in certain cases warehouse floors may be loaded to even more than 2½ cwt. per super foot.

SURVEYORSHIPS.

BRIDLINGTON, YORKSHIRE.—Mr. R. Ralston Brown, C.E., Surveyor and Electrical Engineer to the Bridlington Urban District Council, has just retired from that position after eight years' service. He will commence practice as an architect. Mr. J. Freebairn Stow, C.E., Assistant Surveyor, was, at the last monthly meeting of the Council, elected Surveyor; and, as the town is shortly to be incorporated, he will become its Borough Surveyor.

THE COOPERS' COMPANY.—Mr. George Elkington has been appointed "Surveyor and Architect" (so the appointment reads) to the Worshipful Company of Coopers, in place of Mr. Barnes-Williams, who has been appointed an assistant on the Court of the Company.

OBITUARY.

SIR CHARLES HUTTON GREGORY.—By the death of Sir Charles Hutton Gregory, which occurred on the 10th inst., at the advanced age of eighty, the engineering profession has lost one of its most influential and prominent members. Son of Dr. Gregory, the eminent mathematician, he soon turned his attention to engineering, and, after being privately educated, he served an apprenticeship as a millwright to the well-known Mr. T. Bramah. He was afterwards employed in the capacity of an assistant engineer by R. Stevenson on the construction of the Manchester and Birmingham Railway, and later by J. Walker to look after the building of a graving dock at Woolwich. In 1840 he became resident engineer on the London and Croydon Railway, and subsequently superintended the making of the Croydon and Epsom line. In 1855 he was appointed by the Government to be a member of the Ordnance Select Committee, a position he held for three years, and in 1868 the members of the Institution of Civil Engineers elected him to be their President. Since that time, and until recent years, when his advanced age prevented him taking so active a part in his profession as formerly, he was consulted upon practically all the most important works which were either proposed or executed. Much of his time was given to the study of improvements in ordnance and heavy armour plate construction, and he was called upon to report on railways in France, drainage schemes in Italy, besides acting as consulting engineer in connexion with a large number of railways in Cape Colony, Ceylon, and other parts of the world. He was made C.M.G. in 1876, and a Knight of the same Order seven years later, in recognition of eminent services performed during a long and busy life.

M. LOUVET.—M. Louis Victor Louvet, architect and member of the "Société Centrale des Architectes Français," died at Versailles last week, at the age of seventy-five. M. Louvet was a pupil of Huyot, Lévêque, and Lébans, and obtained the Grand Prix de Rome in 1850 for his "Projet de Place Publique." At the Villa Medici he was a fellow student with Bonjean, Baudry, and Bertinot, and applied himself to a serious study of the remains of ancient Rome, as well as those of buildings in Greece. On his return to Paris, he took part in the competition for the rebuilding of the Opera House, in 1860, and became an "Inspecteur-Principal" under M. Charles Garnier. He was afterwards architect to the Ecole Nationale des Arts Décoratifs and to the Panthéon, and the interior decoration of that church was undertaken under his direction. He was appointed Chevalier of the Legion of Honour in 1875. For the last ten years he had given up the practice of his profession on account of ill-health.

MR. STACY MARKS.—The death of Mr. Stacy Marks, R.A., occurred on Sunday, at his residence in Regent's Park. Born in 1839, he studied drawing at Leigh's Academy in Newman-street, and gained admission in 1851 as a student to the Royal Academy, to which body and the Water-colour Society he was elected an Associate in 1872. In 1878 the deceased was elected R.A., a distinction which he relinquished to become an "honorary retired Academician" a few years ago. He was a constant exhibitor to the Royal Academy since 1853, but besides painting pictures he devoted some of

his time to decorative art. He executed mural decorations for Messrs. Clayton & Bell, designed procenium friezes for the Gaiety Theatre and other playhouses, and did part of the frieze running round the outside of the Albert Hall; and carried out work at Eaton Hall, Crewe Hall, and other private houses.

GENERAL BUILDING NEWS.

ALTERATIONS, KNIGHTON PARISH CHURCH.—Alterations and extensions have been carried out at Knighton Parish Church, Radnorshire. The nave of the church was restored about twenty years ago, but, owing to various difficulties, the chancel remained untouched. Besides the erection of a new chancel, the work includes the building of an organ-chamber. The designs were furnished by the late Mr. Pearson, R.A., and the builders were Messrs. Cadwallader & WEALE, with Mr. W. J. Crook as clerk of the works. The new chancel is 37 ft. by 25 ft., while the dimensions of the organ-chamber are 14 ft. by 12 ft., and the total cost of the extensions are a little short of 3,000l. The east window, costing upwards of 225l., was given by the parishioners, as a permanent memorial of the Queen's Diamond Jubilee. It was designed and executed by Mr. Curtis, of London. The floor of the chancel has been paved with encaustic tiles. The choir stalls are of carved oak and have been furnished by Messrs. Jones & Willis, Birmingham. A stone pulpit has been substituted in place of the old one.

REOPENING OF THE LADY CHAPEL, AYLESBURY.—The Lady Chapel of St. Mary's Church, Aylesbury, has just been reopened after restoration, from plans drawn by Mr. J. Oldrid Scott, Diocesan Architect. Tenders for the work were invited in three sections:—(1) the panelling of the Lady Chapel and erection of a new reredos at the east end on a raised dais; (2) alteration of old monks' choir, and (3) adding the old priests' vestry to the Lady Chapel. The accepted tender was that of Messrs. Webster & Cannon, of Aylesbury. The panelling round the chapel is of oak, as also is the reredos. The style which has been adopted in carrying out the alterations has been a blending of the Early English and Perpendicular. The walls have been re-coloured, and the floor of the old priests' vestry lowered 2½ in. to bring it on a level with the Lady Chapel, of which it now forms part. A temporary vestry has been formed in the north transept.

CHURCH BUILDINGS, BEARWOOD, BIRMINGHAM.—A new building which the people of St. Mary's, Bearwood, have erected, is to afford accommodation for the Sunday school, and it will serve as a meeting-place for various Church organisations. The building, which is of brick, stands contiguous to the church, and comprises a hall, with seating accommodation for 300 people, two class-rooms, and other appointments necessary to the fulfilment of the scheme. The cost has been 3,850l. The contract has been carried out by Messrs. Harley & Son, from the plans of Mr. J. H. Hawkes, of Birmingham.

NEW CATHOLIC CATHEDRAL AT LOUGHREA.—Considerable progress has been made in the work of erecting in Loughrea the new cathedral, the foundation stone of which was laid in October. The total length of the nave inside the walls will be 120 ft. and the width across the transepts will be 30 ft. by 21 ft. and the side chapels 15 ft. by 15 ft. The cost of the structure is roughly estimated at 20,000l. The plans provide for nave, sanctuary with apsidal end, aisles, transepts, baptistry, two sacristies, tower, and spire. Mr. W. H. Byrne, C.E., and Mr. Glynn, both of Dublin, are carrying out the work, the former as architect, and the latter as contractor.

RESTORATION OF MELLOR CHURCH, LANCAIRESHIRE.—This building has just been reopened after restoration. The roof and coping stones have been repaired. The Dodgson monument has been placed inside the church, and a substitute erected over the family vault, and the Hargreaves, Dodgson, and Troy windows have been protected with sheet glass. The main entrance to the church has been improved. An organ, the gift of Mrs. Yerburgh, has been built by Mr. Edwin Smith, of Blackburn. A new font has been given by Mrs. Arthur Pigbe, and is a copy of a thirteenth or fourteenth century font which was discovered buried beneath the floor of the old church at Welshpool, Montgomeryshire. Mr. Varley, of Blackburn, carved the font, and Mr. Harry Hems, of Exeter, the cover. The chancel screen, the gift of Mrs. Daniel Thwaites, is of oak. The architects for the work of restoration were Messrs. Paley & Austin, Lancaster; and Messrs. J. Hatch & Sons, Lancaster, were the contractors.

RESTORATION OF SCAWTON CHURCH, YORKSHIRE.—Scawton Church, Yorkshire, has just been reopened, by the Archbishop of York, after restoration. The church is situated on the highest part of the Hambleton Hills, and it consists of a nave and a chancel, with a south porch. The whole of the work has been carried out by local contractors, from the designs of Mr. C. Hodgson Fowler, the Diocesan Architect.

CHURCH RESTORATION AT CREATON, NORTHAMPTON.—New choir stalls, altar, and tryptich were dedicated at this church recently, and the completion

of the partial restoration of the chancel was celebrated. The architect was Sir Arthur Blomfield.

METHODIST CHURCH, SOUTHPORT.—The New Zion Independent Methodist Church, Southport, has just been reopened. The buildings, which are placed at the corner of Sussex-road and St. Luke's-road, are erected upon the site of the old chapel. The school is placed on the ground floor, which is three steps below the street level, and is 48 ft. by 30 ft., and can be divided into class-rooms with sliding partitions. There are also two class-rooms entering from the school-room. The chapel is also 48 ft. by 30 ft., is placed over the school, and is approached by a staircase and vestibule screen. A gallery is placed over, and is approached by a staircase from the vestibule. The chapel will seat 300 people. There are also two vestries entering from the chapel. The building is Renaissance in style, faced with Accrington bricks and Yorkshire stone dressings. The roof is covered with green slates. The internal woodwork and fittings are in pitchpine varnished, the whole being heated with hot water, and fitted with electric light throughout. The contractors have been let separately to local tradesmen as follows:—Brickwork, Messrs. Buck & Hodson; stonework, Mr. Richard Wright; joiners' work and fittings, Mr. W. H. Foster; slater and plaster, Mr. William Wright; plumbers and glaziers, Messrs. Drain & Gregson; lead-light windows, Mr. Holaway; hot-water fittings, Mr. Richard Sumner; painting and varnishing, Messrs. Woolfall & Rimmer; electric light, Messrs. Wild & Rothwell; ventilating, J. H. Pickup & Co., Bury. The work has been carried out from designs and under the superintendence of the architect, Mr. J. E. Sanders, Southport. The total cost will be about 2,000l.

PRESBYTERIAN CHURCH, RYE HILL, NEWCASTLE-ON-TYNE.—The Eastern Presbyterian Church, Rye Hill, Newcastle, is being reconstructed. The new church, which is being erected from the designs and under the superintendence of Messrs. Badenoch & Bruce, architects, will accommodate about 500. Two entrance porches project into the open ground in front, giving access to vestibules and staircases leading to galleries above, and are placed round three sides of the church. The existing schoolroom in the basement is not to be interfered with, but the front portion under the vestibules will be converted into a ladies' room and tea-room, with wide vestibule and entrance lobby, lavatories, &c. The whole scheme includes a hall, seated for about 150, on the vacant site to the north of the church, with minister's vestry, both being on the same level as the ground floor of the church, and on the basement level there will be infants' class-room, session room, heating chamber, and lavatories. The present contract is for the church only, Mr. Robt. Veale being the contractor. The heating will be by low pressure hot water pipes and radiators. The ventilation is by Coulsand & Mackay's climax roof ventilators, with Sheringham air inlets, and the electric light is proposed to be introduced throughout.

BAPTIST CHAPEL, BIRCHCLIFFE, HALIFAX.—A new Baptist chapel is being erected at Birchcliffe. The cost of the building, including the ground, &c., was probably be about 10,000l., and the sitting accommodation will be for about 1,000 persons. The architects are Messrs. Sutcliffe & Sutcliffe, of Hebden Bridge and Todmorden, and the clerk of works is Mr. Stansfield Tiley, of Hebden Bridge.

PRIMITIVE METHODIST CHURCH, NEWCASTLE.—On the 1st inst. Kingsley-terrace Primitive Methodist Church, Newcastle, was opened. The new church and school have been erected from the designs of Messrs. Marshall & Dick, architects, of Newcastle. The church externally appears lofty, owing to the hall being placed beneath the church and not sunk into the ground as a basement, the school being entered from the street level on the Normanton-terrace side. The main entrance to the church is from the north end, at the junction of Kingsley-terrace and Normanton-terrace, and is approached by stone steps, which gives access to a vestibule communicating with the tower stairs and entrance at the north-west corner. The church consists of nave and transepts, the bulk of the sittings being on the ground floor, a small gallery only accommodating about ninety, occupying the north end over the entrance vestibule, &c. The total accommodation is for about 500 persons. The rostrum is recessed, and has doors on either side communicating with the vestries and stairs to the hall, &c., below. An organ chamber is provided. In the rear, on the church level, are arranged the church parlour, the ministers' vestry, and the stewards' room; while a staircase communicates with a side entrance in Kingsley-terrace, and with the halls and other rooms on the ground floor. The hall occupies about three-quarters the area of the church above, and is lighted by eight windows entirely above the ground level. It is divided up by folding screens for class-room purposes. The stone used in the erection of the building is from the Kenton and Windy Nook Quarries, the exterior being rock faced with chiselled quoins and dressings. The seating of the church is of Oregon pine, stained and varnished, and the floors of the hall, &c., are of wood blocks on concrete. The heating is by low-pressure hot-water, ventilating radiators being placed in window recesses and elsewhere. An electric fan will be placed in the tower. The buildings throughout are illuminated by electric light. Mr. T.

thinson, Newcastle, is the contractor for the rock.

GORBALS FREE CHURCH, GLASGOW.—The memorial stone of Gorbals Free Church was laid recently by Lord Overton. The church is situated a central position on the eastern side of South-land-street, and between two high four-story elements. The frontage block consists of entrances, and side aisles, while the church is placed behind the main block, extending to a lane and lighted from each side.

The church itself is square on plan, with side and end galleries, and will be seated for 918 persons. It is internally divided into a nave and side aisles by columns which support the galleries and roof, and steel girders over the galleries divide the roof longitudinally into three sections. The central portion is carried up much higher than the sides. At the pulpit and two stone piers divide the space into three, the side sections forming organ chambers, while the centre is occupied by the platform, which is partly recessed and partly projected into the church. The pulpit is proposed to take the form of an open platform, with only a small reading desk in front. The church will be lighted under the gallery by a series of triplet windows divided by dwarf slabs, and over the galleries by large triplet windows with arched heads. The hall is placed on a first floor on the gallery level, and is 60 ft. by 7 ft. 6 in. A beadle's house occupies a portion of the upper floor. Besides the church and hall there are also on the basement floor two lesser halls, each 160 persons, a kitchen, store-room, and lavatory; and on the street floor, a ladies' room, vestry, and cloak-room, and a cloak-room, with lavatories, and a extra vestry is arranged at the eastern end of the church, where are also two extra exit porches leading into the lane. The style is Classic of a severe type. The stonework is of red sandstone from Kilmawick quarries. The estimated total cost is £5,000. The architect is Mr. John B. Wilson, Glasgow, and the work is being carried out under the supervision, with Mr. James Mair as clerk of works.

PRIMITIVE METHODIST CHURCH, TREDEGAR.—A new building, erected for the Primitive Methodists at Walter-street, Tredegar, was opened recently. The new chapel provides accommodation for about 200, and has a school-room at the rear. The plans were prepared by Mr. W. S. Williams, architect, Tredegar. The builders were Messrs. Edwards Bros., Tredegar.

BAPTIST CHAPEL, CAMBRIDGE.—A new chapel which has been erected in Teison-road, Cambridge, for the congregation of Particular Baptists, has just been opened. The building is of red brick with stone facings, and Perpendicular in style. The extreme internal length is 71 ft. 7 in., and the breadth 35 ft. 6 in. The building has been constructed to hold 335 persons, but at present a portion is partitioned off to provide school and class-rooms, so that the space now used as a chapel provides seating for 120. The baptistry is provided in front of the pulpit. The heating apparatus is under the vestry, and is combined with the ventilation. The cost of the building is about £5,000. The architect was Mr. Walter Bell, and the builders Messrs. Bell & Richards, of Cambridge and Saffron Walden.

CATHOLIC CHURCH, GLASGOW.—St. Patrick's Church, situated at the corner of North-street and William-street, Anderson, has just been opened. The nave is divided into seven bays, is 102 ft. long, 30 ft. wide, and, including aisles, the total width is 50 ft. The clearstory is supported by three arches of a span of 27 ft. These arches are supported by granite columns. In each of the seven bays of the clearstory is a five-light window with tracery head. The west window is divided into seven lights, and is 32 ft. high. The baptistry is placed at the end of the aisle on the gospel side, and is lit by a three-light tracery window, and the confessionals are in recesses in the aisle on the gospel side. The chancel is divided from nave by a chancel arch, and terminates with a five-sided apse, in each bay of which is a two-light window with tracery head. The side chapels are divided from chancel by an arch, over which are two two-light windows with tracery heads. Each chapel is lit by a rose window. There are two doors under the west window, approached by a flight of eight steps from North-street, and another at the end of aisle, approached from William-street. An exit door has been put at the chancel end of the aisle, leading into William-street. The organ gallery at the west end is reached by a circular stone staircase. The roof, supported by six principals, has a total height, from floor to height, of 67 ft., but is ceiled internally at a height of 57 ft. The internal length of the church is 134 ft. Accommodation is provided for over 1,000 worshippers. There is ample sacristy accommodation. The presbytery, which has just been completed, is connected to the church by a corridor from the sacristy. The church and presbytery are built of Lochaber stone, the roofs covered with slates from the Aberfoyle quarries. The church has been erected at a cost of £9,000, and both church and presbytery are lit by electric light. The whole has been designed, and carried out under the direction of Messrs. Fugitt & Fugitt, of London. Mr. Harvie was the inspector of works. The following is a list of the tradesmen:—Messrs. John Devlin & Son,

masons; Allan & Baxter, joiners; A. Bryan, slater; Fife & Allan, plumbers; D. McKenzie, plasterer; McCulloch & Co., glaziers and painters—all of Glasgow.—*Glasgow Herald.*

SCHOOL, GLEN TANA, ABERDEEN.—New school buildings have just been opened at Glen Tana. The style of the buildings is Scotch Baronial, and the architect was Mr. G. Truett, of London.

ENDOWED SCHOOL, LONG PRESTON, YORKSHIRE.—The new building of the Long Preston Endowed School was opened on the 3rd inst. by the Bishop of Ripon. The architect was Mr. C. R. Chorley, of the firm of Messrs. Chorley, Cannon, & Chorley, Leeds. The new schools are built on the central hall system, and will accommodate 152 boys and girls, 64 infants, and 41 babies. The central hall, which is lighted at the top and ends, is 53 ft. long by 24 ft. wide, and will also be used for parochial gatherings. Around the hall are the class-rooms, cookery class-room, infants' school, and babies' room. The walls are of Bradford stone, and the internal woodwork of pitch pine. The total cost has been £3,000. The following contractors have carried out the work:—Masonry and carpentry, James Russell; plumbers' work and painting, Thomas Hasbrouck; slating and plastering, William Jackman, all of Long Preston; and ironfounders' work, Messrs. Teale & Somers, Leeds.

ST. JAMES'S EPISCOPAL SCHOOL, STONEHAVEN.—The additional rooms recently added to St. James's Episcopal School, Stonehaven, were opened on the 4th inst. The addition to the school consists of two class-rooms, a teachers' room, and lavatories. The architect of the new building was Mr. J. A. Scutt, Messrs. Smith & Co., Stonehaven, carried through the mason work; and Messrs. R. Mitchell & Sons, Stonehaven, the joiner work.

PROPOSED COTTAGE HOSPITAL, SKIPTON.—It is proposed to erect a cottage hospital at Skipton, from plans prepared by Mr. E. C. H. Maidman, architect, of Edinburgh. The hospital is intended to accommodate sixteen patients, for whom three wards—one for men, one for women, and one for children—as well as two private rooms, will be provided. All the wards look to the south, and are on the ground floor; while the matron's sitting-room, nurses' sitting room, the operation room, and other apartments face north. Between the wards and the rooms to the north a corridor extends the entire length of the building. The bedrooms for the matron, nurses, and domestic servant are in the second story, which rises in the centre of the block, all the rest of the building being one story, with offices of various kinds in the basement.

WORKHOUSE INFIRMARY, NEWTON ABBOT.—The new Workhouse Infirmary at Newton Abbot has just been opened. The building comprises a central block in which are twelve rooms, 17 ft. by 14 ft., nurses' duty-rooms, &c., and two wings with two wards in each, 62 ft. long by 24 ft. wide. All are 11 ft. high. At the rear, connected by covered ways, is another building, including three lying-in wards and five bedrooms for the nurses. Two of the lying-in wards are 22 ft. by 20 ft., and the other is 15 ft. square. There is a cellar under one of the wings for the boilers and machinery for heating the building. The exterior walls are of local dressed limestone with white brick dressings, and the interior walls are of brick, a cavity being left between the two. Twelve of Bayly's fresh-air inlets have been erected in each of the wards. All four of the large wards are heated by means of Shorland's Manchester stoves, of which there are two in each ward. Fireplaces are provided in the other wards. Corridors, bathrooms, staircases, &c., are heated by steam from the six-horse power boiler in the cellar, which boiler also supplies the whole building with hot water. There are seven bath-rooms, including that in the lying-in ward, all separated from the wards by ventilation lobbies. All the corridor floors and ceilings, as well as the walls and ceilings of the staircases, are of fireproof construction, and the corridors, lobbies, and offices are lined with glazed bricks to a height of 4 ft. 6 in. On the ground floor there is a surgery. The Infirmary will accommodate 120 patients. Mr. S. Segar is the architect; and the building has been erected by Mr. F. A. Stacey, and Mr. J. Cole, of Torquay, is the clerk of the works.

THE NEW CAMBRIDGE MUSIC-HALL, LONDON.—The Cambridge Music-hall, Bishopsgate, which was burnt down some time ago, having been rebuilt, has now been reopened to the public. There are eight entrances in Commercial-street, and four separate exits are provided for the pit and gallery with an additional exit from the latter delivering into Vine-court. A saloon has been provided at the Commercial-street level. The pit and stalls' floor is about 10 ft. below the level of Commercial-street. The total seating accommodation for the stalls, pit, private boxes, circle, and gallery is 2,000 persons, with standing room in the rear of each tier for another 300. Mr. Harry Percival was the architect.

ALHAMBRA THEATRE, ATTERCLIFFE, SHEFFIELD.—This building, situated on the main road at Attercliffe, has just been opened.

The building is intended for seating accommodation for 1,600 persons. The architects for the building were Messrs. G. D. Martin and A. Blomfield Jackson. Inside, the accommodation comprises on the ground floor orchestra stalls, stalls and pit, and upstairs a large circle or balcony. The decoration is

of Moorish type. The building is fireproof throughout and the balcony is on cantilevers, with a flooring of concrete. Two modes of lighting have been adopted—an electric installation, the electricity being generated from a steam-engine and dynamo on the premises, and in addition an installation of gas for use in emergencies. As to means of entrance and exit, there are four doors from the ground floor, and two from the balcony, and a pass stair between the two parts. The stage has a separate entrance at the back of the building, and in close proximity are dressing rooms and the manager's office. Messrs. J. T. Rickett & Co. have carried out the electrical work, and the Sheffield Gas Company have fitted up the system of gas lighting. The building itself has been erected by Messrs. G. Longden & Sons, of Sheffield, the decorations, seating, and upholstery being carried out by Messrs. A. R. Dean, of Birmingham.

BUILDING TRADE, ARBOATH.—The building trade of Arboath during the past year has been in a prosperous condition, and tradesmen have been kept busy from beginning to end. The most important work that has been carried out during the year is the Free Library buildings, which are now approaching completion. Messrs. Douglas, Fraser & Son's new engineering works have been finished during the year, and are now fully occupied. There has been a large amount of work carried out during the year in alterations and additions to the various public works. Improvements on the High-street still continue. The erection of new dwelling-houses still goes on. New tenements have been erected in Lordburn, Lochland-street, Fergus-square, St. Vicens-road, and Kinnaird-street; and others are in course of erection in Ernest-street and St. Vicens-road. A large number of cottages have also been erected in various parts of the town, while others are to be begun shortly.

BUILDING IN BARNSELY.—Mr. J. H. Taylor, Borough Surveyor, has issued his return of plans passed and buildings erected in Barnsley in the past year, and since 1880. It shows that last year 90 sets of plans were deposited for 203 buildings, of which 199 were houses, five shops; two public buildings; 12 workshops; and 43 alterations. Two buildings were erected, of which 206 were houses; seven, shops; four, public buildings; seven, workshops; and 39 alterations and additions. In 1896 the number of buildings proposed was 409, and buildings erected, 348; in 1895, 428 were proposed, and 231 erected; in 1894, 340 proposed, and 214 erected. The return shows that building has gone on in Barnsley since 1890 at a much greater rate than ever before.

THE BELFAST BUILDING TRADE.—The improvement reported twelve months ago in this trade has been steadily maintained during the past year. The supply of bricks being much greater than formerly has prevented the scarcity experienced in previous years. At the same time the stocks in the yards are not unusually large for the season. Among the many new edifices which have been erected during the year we might refer to the first portion of Messrs. Anderson & McAuley's buildings, which have been completed, and are now being occupied by a firm during the rebuilding of the portion in Donegal-place. The removal of the old buildings has obliterated another of the most interesting structures in Belfast, while the clearing of the site where the Scottish Provident Institution are now erecting a block has also removed some old and familiar structures. A new bonded warehouse has been completed, and is now occupied. Messrs. J. & T. Sawers, High-street, have completed the addition to their new premises. In Castle-place may be observed Messrs. Malcomson Brothers' establishment, which is nearing completion. Messrs. Dunville & Co. have almost finished the continuation of their suite of offices in Arthur-street, which now extend through to Callender-street; and Messrs. Arnott & Co. are continuing their Bridge-street premises out into High-street by placing a block on that corner. The Mater Infirmorum Hospital is virtually completed. The Belfast and Northern Counties Railway Company have during the year improved their York-road terminus, but the work is not quite finished. It is, however, so far advanced as to enable travellers to enter and depart at the new entrance, which is nearer the city than the old one. There is a covered way for cabs and cars, also for trams. In connexion with this, we understand, the Company are also building a hotel for the convenience of their passengers arriving by late trains. Amongst the other prominent buildings which have been completed we might mention the new Presbyterian Church, York-road; the Baptist Church, Antrim-road; and the E.U. Congregational Church, Rugby-avenue. The new mission buildings, Shankill-bridge, are progressing rapidly. As to the Albert Bridge Congregational Church, it is almost ready for the roof.—*Northern Wh.*

BOLTON BUILDING TRADE.—The year just closed has, like many preceding similar periods within the present generation, been characterised by considerable activity in connexion with building operations in this borough and the adjoining districts. Including the completion of undertakings commenced before the advent of 1897 and the work still in hand by Bolton architects and contractors, the catalogue of structural extensions and renovations assumes, in the aggregate, formidable proportions, and also

shows much variety, the spread being not only in the direction of industrial and commercial development, but likewise in that of religious and educational progress so far as regards providing facilities therefor; while new warehouse, shop, and dwelling-house construction has continued to be carried out on an extensive scale. We may also mention incidentally that many of the local architects have in addition been engaged in undertakings of a miscellaneous and of a more important nature in places much further afield than our own borders.—*Bolton Chronicle.*

BUILDING TRADE IN GRIMSBY.—The most costly buildings commenced in Grimsby during the past year are the Royal Diamond Jubilee Homes, which comprise a block of twenty-nine residences, occupying a site on the Doughty Subway-road. There have been large extensions to licensed premises, and also new buildings of this class, notably the Fountain Inn, Victoria-street, Grimsby, and the Leeds Arms, at Cleethorpes. The increase of new and commodious buildings on a much more extensive and expensive scale than has been seen heretofore on the Fish Docks has been noticeable, conspicuous examples being the new premises of the Coal, Salt, and Tanning Company's engineering works and blacksmiths' shops, the Box Company's engineering works, Mr. Chas. Jeffs, jun., new smoke-house, the offices of Messrs. Moody & Kelly, and extensive premises now in course of erection for the North Eastern and International Trading Company, Limited. With reference to what we may term the speculative building of residential property, which has always been a feature of the Grimsby building trade, although this in the past year has not progressed with such leaps and bounds as formerly, yet there has been a great amount of house building by the various societies in the town.—*Grimsby News.*

BUILDING TRADE, OLDHAM.—Unlike other trades, the building trade of Oldham was uninterruptedly prosperous during the past year. This comes rather as a surprise when it is remembered that in the town no mill has been erected of late; still, many rows of streets have been made on the outskirts of Oldham, and here some hundreds of men have been continuously employed. At Royton, where two cotton mills are being erected, matters connected with building have been very busy, and all the surplus labour of the district has found employment. In 1896, there was a great scarcity of labour locally, the men preferring to go to Manchester and district, where higher wages were paid them, but at the beginning of the past year local contractors saw their error and raised the wages of their men, who now are receiving the same as workmen elsewhere. The all-round good state of the trade may be guessed when it is mentioned that in many instances local contractors have refused to tender for certain works on account of having their hands so full.—*Oldham Standard.*

ARDWICK LADS' CLUB, ANCOATS.—The foundation-stone was laid on the 27th ult. of the Ardwick Lads' and Men's Club, in Palmerston-street, Ancoats. Messrs. W. & G. Higginbottom are the architects. According to the design, the entrance to the club is to be placed in the centre of the buildings in Palmerston-street. The lads' part of the club is on the left hand side of the entrance, and consists of a gymnasium, 70 ft. long by 40 ft. wide, with a gallery on two sides for spectators, and three full-size five courts. Dressing-rooms and bath and lavatory accommodation are provided in separate rooms leading from the gymnasium. The men's department is placed on the right hand side of the entrance, and comprises a reading-room, and a billiard-room with two tables, with lavatory adjoining. A skittle-alley is also provided, leading from the billiard-room. In the back portion of the premises is a class-room, and also the caretaker's residence. On the first floor, and approached by a fireproof staircase from the vestibule, a room for meetings and entertainments is provided. There is also to be a games-room, a library, three class-rooms, a committee-room, and a private bedroom. The elevation to Palmerston-street will be of grey bricks with terra-cotta dressings. The buildings are being erected by Messrs. R. Neill & Sons.

MUSIC HALL, ISLINGTON GREEN.—Collins' Music Hall, Islington Green, has just been rebuilt, the work having been carried out in four months. The adoption of the cantilever system enabled the designer of the steel work to make a single column suffice for the support of the balcony and gallery, so that the whole 1,800 seats have an uninterrupted view of the stage. This work was designed and erected by Messrs. Drew Bear, Perks, & Co., of Queen Victoria-street. The steel work in plates and angles for the main girders are of English manufacture, and the girders themselves were made in London. Messrs. C. Deering & Son were the builders, the work having been carried out from plans and under the direction of Mr. E. A. E. Woodrow.

CO-OPERATIVE STORES, YORK.—New premises are being built by the York Equitable Industrial Society in Railway-street. The building will have frontage to Railway-street and Tanner-row of about 200 ft. It will be divided into six shops. The rear of the building will be entirely occupied by warehouses, the entrance to this portion of the establishment being in Tanner-row, through a gateway about 12 ft. wide leading to a loading yard

covered with a glass roof. Two stone staircases lead to the offices and board-room on the first floor. The second floor will be used for the workrooms, caretaker's apartments, and tea rooms for the employees. There is also on this floor an assembly hall to seat six hundred people, with a gallery at one end and platform and retiring rooms at the other. The building will be lighted by gas and electricity. There are also three steam lifts. The building will be brick, faced with red Nostell brick and sandstone, the style being freely treated Renaissance. It is estimated that the cost, exclusive of the site, will be 20,000l. Messrs. Athron & Beck, Doncaster, are the architects, and Messrs. Arnold & Sons, of the same town, the contractors.

BUILDINGS IN THE HAYMARKET, NEWCASTLE.—Works are in progress at the Haymarket for the Newcastle Breweries, Limited, covering nearly two-thirds of an acre of land, and comprising bond for wines and spirits, duty paid stores, aerated water manufactory, stabling for about forty horses, besides traction engines, boiler, engine, and dynamo houses for electric plant. The existing buildings in St. Thomas-street are to be included in the bond, and the necessary works to meet excise requirements are nearly completed. Facing the Haymarket a block of offices will be erected, the architect is Mr. Joseph Oswald, of Newcastle, and the consulting engineers for the electric plant are Messrs. Bursall & Monkhouse, of Westminster. The contractor for the works in progress is Mr. Walter Scott, of Newcastle, and the clerk of works is Mr. Edward Codling.

GREAT CORBY JUBILEE COTTAGE, CUMBERLAND.—Mrs. Hills, Corby Cottage, recently laid the foundation stone of the Great Corby Jubilee Cottage, which is being erected adjoining the Reading-room in the village as a permanent memorial of the Queen's Diamond Jubilee. The cottage will be in direct communication with the existing Assembly and Reading-rooms by means of a corridor, and it will provide accommodation for a caretaker. The work is being carried out according to plans prepared by Mr. A. W. Johnston. Local red stone is the material used, and the contractors are as follows:—Mr. Thomas Milburn, Corby, builder; Mr. Musgrave, Carlisle, joiner; Mr. C. J. Nanson, Carlisle, slater; Mr. Ferguson, Wetherall, plumber; Messrs. R. block and Sons, Carlisle, plasterers; Messrs. Nelson & Son, Carlisle, painters; and Mr. Millican, Corby, ironwork.

ST. PAUL'S NEW CHURCH ROOM, SHANKLIN.—The new church room for St. Paul's parish, Shanklin, has just been opened. The hall is constructed of local stone, with local freestone dressings, the roof being covered with red tiles. It is 60 ft. long by 28 ft. wide. There are two entrances, one at the north corner of the church, and the other at the north angle of the building. On the south side of the hall is a doorway in direct communication with the church. A platform is provided, a kitchen is underneath, and there are the usual offices. An infants' class-room about 20 ft. in width is also provided on the north side. Mr. F. Cooper was the builder, the architect being Mr. L. Colenutt.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of the Town Council has sanctioned the plans of the following new buildings in the city:—Alterations in connexion with business premises on the west side of Back Wynd for Mr. William Ferries, per Mr. John Rust, architect. Alterations at Royal Buildings, Union-street, for Mr. William Falconer, per Messrs. W. and J. Smith and Kelly, architects. Four dwelling-houses, with shops, on the west side of Menzies-road, at its junction with Craig-place, for Mr. John Park, builder (further amended plan). Additions and alterations in connexion with the premises No. 138, John-street, for Mr. James Lumsden, per Mr. Bridgeford M. Pirie, architect. Dwelling-house on the north side of Huntly-street, at its junction with Chapel-street, for Messrs. Brown & Watt, architects (amended plan). The committee had also before them plan of office, model room, &c., on the north-east side of York-street, for Hall, Russell, & Co., Limited, per Mr. John Rust, architect. The committee disapproved of the proposed floor level of the heating chamber, and fixed the level at which the floor is to be laid. The committee in other respects approved of the plan.

NEW POOR-LAW INFIRMARY, CHESTER-LE-STREET.—The Guardians of the Chester-le-Street Union have almost completed a new infirmary in connexion with their workhouse, which is to be named the "Jubilee Infirmary," in commemoration of the sixtieth year of her Majesty's reign. The administrative block is centrally situated, and of three stories. On the ground floor are situated the doctor's and nurses' rooms, ward kitchen, stores, &c. On the first floor are the nurses' duty rooms and separation wards, and on the second floor are the nurses' bedrooms, &c. On each side of this block are the male and female night and day wards, these being two stories high. The building is centrally supplied by Messrs. Blythe, of Birtley. The building is heated throughout by steam, Messrs. Henry Watson & Son, Newcastle, in conjunction with Messrs. R. Dawson & Co., Limited, Stalybridge, hot-water engineers, being the contractors for this work. Mr. C. Groves, builder, &c., Chester-le-Street, is contractor for the whole of the work except the heating. The total cost of the building will reach

9,000l. Mr. Cowe, Chester-le-Street, is the architect.

UNION SAVINGS BANK, DEVONPORT.—A new branch of this bank has been erected at Keyham. The work has been carried out by Mr. W. Littleton, from plans by Mr. H. G. Luff, architect, of Devonport.

WORKING MEN'S INSTITUTE, MILFORD, SURREY.—This building consists of a room 30 ft. by 19 ft., a committee-room, and the caretaker's apartments. At the rear are a cloak-room and lavatories. The architect is Mr. Watson, of Farnham, and the contractor, Mr. Norris, of Sunningdale.

WORKMEN'S DWELLINGS, KIRRIEMUIR.—Messrs. L. & J. Falconer, architects, Blairgowrie, have just concluded contracts for a block of workmen's houses on the South Muir, for Mr. J. Anderson, Forth, Dorset. The contractors are—Messrs. Messrs. Crabbe & Ballantine; joiner, Mr. Adam, Coupar Angus; plumber, Mrs. Adams, Kirriemuir; plasterer, Mr. D. M'Pherson; and slater, Mr. T. Donaldson.

HOTEL, BRAEMAR.—The "Five Arms Hotel," Braemar, is being rebuilt. Mr. A. Marshall MacKenzie, A.R.S.A., Aberdeen, is the architect of the building, and most of the contracts have been obtained by Aberdeen firms.

P.S.A. INSTITUTE, PRESTON.—This building, adjoining the Lancaster-road Chapel, has just been opened. The new entrance to the Institute will be from Lancaster-road instead of the Old Vicarage, and will comprise a vestibule, with staircase to the upper rooms. On the ground floor there is a gymnasium measuring 36 ft. by 34 ft., with separate access from the outside, and provided with lavatory and dressing-room accommodation. On the first floor above the gymnasium are two class-rooms or reading-rooms, which can be sub-divided by rolling shutters into four small class-rooms. Above, on the second floor, there is a billiard-room. There is also a committee-room and other accommodation. The present entrances to the old school, which were by a narrow winding staircase, will be removed and the school-room or hall on the first floor will then be carried to the building line of the Old Vicarage. On the ground floor, under the main hall, the small class-rooms are being rearranged. Messrs. Briggs & Wolstenholme, of Liverpool and Blackburn, are the architects, and Mr. Whiteside, of Preston, is the contractor.

HOTEL FOR THORNTON, LANCASHIRE.—A new hotel is to be built on the site of the "Gardner's Arms," Thornton. The contract has been let to Mr. Jonas Kirkbride, of Fleetwood, the architect being Mr. R. B. Mather, of Blackpool. The building is estimated to cost 4,000l. It will have a frontage of about 100 ft., and a depth of 50 ft.

THE SOUTH LONDON ART GALLERY AND INSTITUTE.—Sir Edward J. Foynter, F.R.A., opened on the 10th inst. the School of Arts and Crafts in connexion with the South London Art Gallery, Peckham-road, Camberwell. The site occupies a position nearly opposite the Camberwell Central Library. The purpose of the new building is two-fold—viz., to furnish a suitable entrance to the art galleries, which are situated to the rear of the site, and to supply accommodation for the Camberwell School of Arts and Crafts. The ground plan includes the modelling studio, the entrance to the galleries and schools, the director's office, men's cloak-room and conveniences. In the basement are workshops for metal-workers, enamellers, and wood-carvers. The building is executed in red brick, with Portland stone dressings, and in the gable over the entrance is placed a sculptured group, representing "Architecture," "Painting," and "Sculpture." The floors and staircases throughout are of fireproof construction. The builder is Mr. J. O. Richardson, of Peckham. The cost of the building is between six and seven thousand pounds. The architect is Mr. M. B. Adams.

VICTORIA INSTITUTE, ARUNDEL.—This building, situate in Tarrant-street, has just been opened. Mr. A. Burrell was the builder and contractor, of Arundel, and Mr. F. Wheeler, of Horsham and London, was the architect.

IMPROVEMENTS AT THE CENTRAL FREE LIBRARY, SHEFFIELD.—The Central Free Library in Tudor-street and Surrey-street, Sheffield, has just been reopened after undergoing alterations and improvements. The structural alterations have been carried out by Mr. Newbold, of the City Surveyor's department, and under the direction of Mr. C. F. Wike, the City Surveyor.

NEW LAUNDRY WORKS, PECKHAM.—New laundry premises, Southampton-street, Peckham, have just been erected for Mr. Stephen. Mr. Edward Crosse was the architect, and Mr. Benjamin Wells, builder and contractor.

SEMPRINGHAM ABBEY CHURCH.—Plans have been approved by the authorities of her Majesty's Woods and Forests Commission for rebuilding the south porch of the ancient abbey church of Sempringham, near Billingborough.

DEEP SEA MISSION INSTITUTE, GORLESTON, YARMOUTH.—On the 7th inst. memorial stones of the Jubilee Memorial Institute, which the Royal Naval Mission, Deep Sea Fisheries, has just been erecting in High-street, Gorleston, were laid. The new building is to cost 5,000l. The institute will be two-storied, of

red brick exterior. A light observation tower will be a feature at the top of the building. On the ground floor there is to be a gymnasium 50 ft. by 20 ft. on a level with the ground above will be two social rooms, with adjuncts in the form of a coffee bar, boys' workshop, &c. Mr. Sidney Rivett, of Yarmouth, is the architect.

MANCHESTER CATHEDRAL IMPROVEMENTS.—Upon inquiry at the offices in London of Mr. Basil Champneys, who is carrying out the improvements at the Manchester Cathedral, a representative of the *Manchester Evening News* was informed that satisfactory progress with the work was being made, and that the centre portion, which comprises the new porch, surmounted by a turret, and upon which the builders are at present working, will probably be completed in about six months' time. This new porch will afford direct access from the street. The porch is flanked on either side by a couple of rooms. With regard to the other additions to the west front of the building, namely, the flanking rooms on each side of the entrance porch, although the tenders have been accepted, the work for the present remains in abeyance until after the centre has been further completed. A portion of the wall on the left side of the porch (looking from the street), and which serves to raise the windows of the rooms on that side well above the level of the street, has, however, been built, but beyond that nothing is to be done for the present in connexion with that portion.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, SHREWSBURY.—Mr. W. George Willocks, C.E. (Inspector of the Local Government Board), opened an inquiry in the Guildhall, Shrewsbury, recently, in reference to the application by the Shrewsbury Town Council for permission to borrow 48,000l. for the purpose of carrying out a new scheme of water supply to the borough. Mr. Graham opened the case for the Council, and gave a detailed history of the whole water problem, which he said had been a constant source of anxiety to the Corporation for many years. The present system was universally condemned. The intake was in the town and liable to serious pollution, and the water was pumped into a service tank in Pride Hill, whence it flowed (unfiltered) by gravitation. Under the new scheme the river would be utilised as the source of supply. The intake, however, would be fixed a mile and a half above the present one, and an impounding reservoir, capable of holding a seven-days' supply, would be constructed at Shilton. There would be four filter beds, and after the water had been dealt with by these it would be pumped through a composite main into a service reservoir to be erected at Hanwood. This reservoir would be capable of holding 1,000,000 gallons, or one day's supply. Mr. Edward Brough, Taylor, engineer (of Messrs. Taylor, Sons, & Santo Crimp) gave a description of the new works. He considered the river was a proper source from which to take a water supply for the borough, and with proper and efficient filtration the Severn water would be perfectly safe and wholesome. Mr. Edward D. Marten, C.E., of Wolverhampton, gave evidence of the flow of water in the Severn at Shrewsbury. The minimum flow was estimated at 85,000,000 gallons per day. The ordinary summer flow would average about 120,000,000. By taking the 1,000,000 gallons from the river as proposed the surface of the river would not be reduced by more than one-tenth of an inch.

MANCHESTER CITY IMPROVEMENTS.—The Manchester Corporation have applied to the Local Government Board for sanction to borrow 180,000l., 170,000l. for the purposes of sewerage and sewage disposal, and 10,000l. for market purposes. An inquiry into the matter was opened some days ago at the Town Hall, Albert-square, by General H. Darley Crozier, R.E., one of the Inspectors of the Local Government Board. There was no opposition to the application. The Assistant Town Clerk (Mr. Thomas Hudson) appeared for the Corporation, and there were also present the City Surveyor (Mr. T. de Courcy Meade) and others.

ELECTRIC LIGHTING NEWS.

WEST HARTLEPOOL.—On the 4th inst. Colonel C. H. Luard, R.E., an Inspector of the Local Government Board, held an official inquiry at the Municipal Buildings, West Hartlepool, in reference to the application of the Corporation for permission to borrow 30,000l. for the purpose of lighting the borough by electricity, and 1,628l. for certain street improvements and for providing open spaces for recreation purposes. The Town Clerk (Mr. Higson Simpson) explained that the Corporation applied for powers under the Electric Lighting Act, and obtained a Preliminary Order. They had since decided to lay down an installation, and the estimate prepared by Professor Kennedy showed the total cost to be 30,000l. An acre and a quarter of land in Burn-road had been purchased for 1,600l., and it was proposed to erect upon it a generating station and other necessary offices. Professor Kennedy gave evidence.

STAINED GLASS AND DECORATION.

STAINED WINDOW, ALL SAINTS', LINCOLN.—A new stained-glass window was dedicated recently at All Saints' Church. The window is by Messrs. Heaton, Butler, & Bayne, of London. It consists of four lights. The subject in each is descriptive of a passage in the Life of Christ.

WINDOW, YARPOLE CHURCH, HEREFORDSHIRE.—A stained glass window was fixed at Christmas time in the west end of Yarpole Church, Herefordshire. The subject of the central light is "The Good Shepherd" and in the side lights are depicted "St. Cecilia" and "Charity." It is erected to the memory of the late Captain Kevill Davies and the work was entrusted to, and has been carried out by, Messrs. Jones & Willis, of Birmingham, London, and Liverpool.

FOREIGN.

FRANCE.—A committee has been formed with the object of saving the remains of Chassériau's paintings in the ruins of the Cour des Comptes, referred to in our last. The latest committee of the Union Centrale des Arts Decoratifs is organising four competitions for young girls who are training for occupations in art industry. Important repairs are being carried out at the church of St. Severin, under the direction of M. Menjot de Dammarin, architect.—The French Government is about to offer to the Sovereigns and members of the Corps Diplomatique of foreign countries a plaque commemorative of President Carnot, the engraving of which is just being completed by M. Roty.—M. Esquié has been appointed for two years to fill the place lately occupied by M. Deglane in the Conseil Général des Bâtiments Civils.—M. Cordonnier has just completed a monument which the city of Lille is about to erect on the Place Philippe-le-Bon, to the memory of Pasteur.—A competition has been instituted by the Government of the Argentine Republic for a design for the pavilion for that country in the 1900 exhibition.—The work on the new prisons at Fresnes, which (as already stated) are to replace the old Paris prisons, Mazas especially, is being actively carried on. It is probable that two of the pavilions will be ready for occupation in about six months.—M. Huet, Inspector-Général des Ponts et Chaussées, has been elected President of the "Société des Architectes et Ingénieurs Sanitaires" for 1898.—The jury in the competition for the rebuilding of the Town Hall of Fière-Champenoise has awarded the first premium to M. Paul Delarue, architect, of Paris; the second to M. Louis Vernier, of Châlons; and the third to M. Brouard, of Troyes.—A large extra-mural almshouse is to be built for the Communes of Colombes, Asnières, Gennevilliers, and Bois-Colombes.

THE GERMAN BUDGET FOR 1898.—Details of the Imperial Budget for 1898 have appeared in the *Centralblatt der Bauverwaltung*, and we see that architectural and civil engineering works undertaken at the expense of the Empire will cost over two and a-half millions sterling. This is, of course, quite independent of the expenditure by individual States, such as Prussia, Bavaria, and Saxony, who always have very large budgets for their War Departments. Of the Imperial expenditure by far the greatest item is for the army, on which over a million sterling is to be spent for barracks, stores, and similar works. The next important item is on the State railways, whose Board of Works is to expend 800,000l. In going through the items we notice that the Home Office will already be using 15,000l. on its preliminary work in connection with the great Paris Exhibition of 1900, and then 5,000l. is to be spent on frescoes and sculptures in the new Houses of Parliament, whilst there is a vote on account for a Speaker's house near the Parliament buildings. The details of the military expenditure includes an item of 60,000l. for field kitchens, being the second vote on a total expenditure of 300,000l. There are also votes on account for a large number of buildings already commenced, and we notice that large blocks are being erected at Mannheim on the Rhine, at Strasburg, at Metz, at Leipzig, and other military centres. The Railway Battalion is also getting over 50,000l. this year out of some 300,000l. for new buildings and equipment. The Budget concludes with a vote for about 75,000l. for buildings in the German Colonies. Of this sum about half goes to Railway and Harbour works at Swakopmund in Africa.

COLOMBO.—At a meeting last month of the Municipal Council a plan for the improvement of the Town Hall was laid on the table. The improvement consists in adding another block to the present building, which is only 60 ft. by 56 ft. The altered building will be 132 ft. by 100 ft., and will have a verandah all round, enclosed by a street wall and railing. The old staircase will be removed, and a new one with a corridor put up. A new council-room will also be provided. Upstairs will be the chairman's office, council hall, library, and superintendent of Works Department. On the ground floor shelters for the carriages of councillors will be built, also quarters for the municipal printing office, whilst the sanitary department will also have extended quarters. The improvements will cost about 750,000. The plans have been prepared by

Mr. Skelton, Superintendent of Works.—*Times of Ceylon.*

JOHANNESBURG.—The Permanent Buildings, in Harrison, Commissioner, and Fox-streets, erected to the order of the South African Permanent Mutual Building and Investment Society, and Messrs. Savory and Woodhouse, at a cost of 50,000l., are now receiving their finishing touches. They are by far the largest buildings in Johannesburg. The style is Renaissance. The structure consists of a basement and five upper stories, the latter containing 150 shops, offices, and private rooms. The basement is set apart for billiard and tea-rooms. Access to the upper stories will be by a lift and by a staircase. There are bathrooms and sanitary conveniences on every landing, and all the walls, partitions, floors, and ceilings are fire-proof. The architect is Mr. W. H. Stucke, and the contractor Mr. R. C. Brown.—*Johannesburg Star.*

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The offices of the Croydon Rural District Council have been removed from 49, London-road to the Town Hall, Croydon, where all communications should in future be addressed.—Mr. W. Everden, quantity surveyor, has removed from 27, Southampton-buildings, Chancery-lane, to 43, Chancery-lane, W.C.—Mr. David Balfour, M.Inst.C.E., 3, St. Nicholas-buildings, Newcastle-on-Tyne, has taken into partnership his son, Mr. D. Balfour, Jun., A.M.Inst.C.E., and the business in future will be carried on under the name of D. Balfour & Son, at the same address.—The business of Mr. Henry Sykes, engineer, 66, Bankside, S.E., has been conveyed to a limited company, as "Henry Sykes, Limited." The management will be in the same hands as before.—Mr. C. J. Innocent, Architect, Sheffield, has removed to Foster's-buildings, 22, High-street, Sheffield.

SANITARY IMPROVEMENT, LIVERPOOL.—We understand that the Sanitary Sub-Committee of the Health Committee of the Liverpool Corporation have under consideration improvements which will be of great sanitary benefit to the city. Complaints have been frequent as to the mode of disposing of the refuse collected at different dwelling-houses, and the difficulty of the removal of the deposits placed in the public streets. To obviate this the Committee have prepared a scheme by which galvanised iron receptacles will be furnished by the Corporation for each house, to be placed in the back yard. These will be removed at stated periods, and the contents carried away in the Corporation carts to the Corporation general refuse depot. The Sanitary Sub-Committee also propose to organise staffs of boys in different sections, to be stationed at different parts of the city, and, under the control of inspectors, they will collect the refuse from the streets into stationary bins, which will be emptied into the carts each day.—*Liverpool Courier.*

NEW ALTAR CANOPY AT ST. WILFRID'S, PRESTON.—A new altar canopy was opened recently at St. Wilfrid's Church, Preston. The electric light, which has been installed, was also used for the first time. The work has been carried out by Messrs. Martyn & Co., of Cheltenham, from the designs of Mr. E. Kirby, architect, Liverpool.

THE MATINEE THEATRE, LANGHAM-PLACE.—This property, together with the furniture, scenery, and other appointments, is offered for sale. The premises were re-named by their present style last April; they are, perhaps, better known as the St. George's Hall, so long associated with the entertainments given there by the late German Reeds (and Corney Grain). The premises, which some forty years ago formed a part of the Portland Bazaar and German Fair were originally built, we believe, in 1838, and were rebuilt after their destruction by fire fourteen years afterwards. Queen's Hall, opened in November, 1893, stands upon the greater portion of the fair and bazaar site.

QUEEN'S COLLEGE, HARLEY-STREET.—We understand that the board of governors propose to expend 7,000l. (towards which sum 3,000l. is still needed) in enlarging and improving their present premises. The college was established fifty years ago, and claims to be the earliest institution founded during her Majesty's reign for the higher education of women.

RENOVATION OF POPLAR BOARD OF WORKS OFFICES.—The offices of the Board of Works for the Poplar District have just been altered and renovated. The board-room has been redecorated. One portion of the contract was to re-cover the roof with zinc, and this gave an opportunity for improving the old ventilating arrangements. All the fittings for this work were from the firm of Messrs. Hendry & Paterson. The whole of the work has been carried out from the designs of Mr. Oxtoby, the Surveyor, by Messrs. Vigor & Co. The sanitary work was executed by Mr. George Jennings, Lambeth.

ARCHAEOLOGICAL DISCOVERY, REIGATE.—An interesting discovery has just been made in the town of Reigate. While some workmen were excavating for a sewer in Nutley-lane they dis-

covered a completely formed roadway about 5 ft. below the surface. The path is about 14 ft. wide, and is composed of flints, the edges of which have been trimmed to fit. By some local archaeologists the path is considered to be a continuation of the noted Pilgrim's Way to Canterbury Cathedral, which passes through the town of Reigate, and which can be seen on the side of the road leading to Reigate Hill, while others, seeing that the path is composed of flints, contend that it formed part of the old Roman road from Winchester to London. The road passed over the hill, and the district was known as Ridge Gate, altered in later years to Reigate.—*Sussex Daily News*.

REGENT-STREET POLYTECHNIC.—The annual distribution of medals, prizes, and certificates to architectural, mechanical, and electrical engineering and mathematical students of the Polytechnic Technical and Continuation School, Regent-street, was made on the 10th inst. by Mr. S. Webb, Chairman of the Technical Education Board of the London County Council. Mr. R. Mitchell, Director of Education, having briefly opened the proceedings, Mr. Webb addressed the students. He moved, therefore, that new some 120 members and students actually on the rolls of the Institution, and though they did not all spend their evenings at work there, the proportion of solid work done would surprise those who were not personally acquainted with it. In addition to the evening classes, day work was carried on which was worthy of taking rank with that of any University in the country. The day school of engineering was turning out numbers of engineers and electricians who were qualified for employment as assistants in the works and offices of engineers. The Polytechnic offered training also to the young builder, who had otherwise scarcely any means in this country of obtaining full the special training which one who aspired to take the position of a great captain of industry required. Such persons would there find a genuine technical college which was second to none in this country. He trusted that when the new University of London was called into existence institutions like the Regent-street Polytechnic would not be excluded from its scope. The prizes were then distributed.

DATE INDICATOR.—Messrs. Ashwell & Nesbit, Limited, warning, ventilating, hydraulic, and electrical engineers, have issued a useful date indicator for the present year.

SOCIETY OF MINIATURE PAINTERS.—The Private View of this Society's Third Annual Exhibition will take place at the Modern Gallery, 175, Bond-street, W., on Tuesday next, and the exhibition will open to the public on the 19th inst.

SITE FOR CARDIFF MUNICIPAL BUILDINGS.—In view of the objections that are being raised to the Cathays Park site for the new Cardiff Municipal Buildings, Mr. H. V. Lancaster, of London, one of the authors of the premiated designs, has prepared a plan of suggested approaches that would in his opinion, if adopted, meet the criticisms to a considerable extent. Mr. Lancaster's idea is to extend the Cathays Park avenue to Queen-street, with an approach thereto from a spot opposite the entrance to Frederick-street; to widen the Frederick-street end by demolishing the block of buildings that stands between Queen-street and the end of Union-street, and then to widen Union-street and Mary Ann-street all the way down to Bute-terrace. This he believes would be found an economical improvement, as it would convert a back street into an important business thoroughfare, and provide an approach in a straight line from Bute-terrace right into the Park and up to the new municipal buildings.

IRON AT HIGH TEMPERATURES.—The issue of *Nature* under date January 8 contains a paper by Mr. David K. Morris on "The Magnetic Properties and Electrical Resistance of Iron at High Temperatures."

FATAL FIRE IN GLASGOW.—A fire broke out on Friday last week, in the premises of Messrs. W. & R. Hatrick & Co., wholesale and export chemists and druggists, Renfield-street, Glasgow. The disaster resulted in considerable loss of property of materials, and also in the death of four members of the fire brigade, while two of their comrades were seriously injured. The building was the property of Messrs. Hatrick, and part of it was occupied by tenants among these being Messrs. Bankier & Co., painters and decorators. Shortly after three o'clock fire was observed in the basement flat of Messrs. Bankier's premises. The alarm was immediately given, and in a brief space members of the fire brigade belonging to two of the divisional stations of the city were set to work. By this time, however, owing to the manner in which the building was constructed and the highly inflammable nature of its contents, nearly the whole of it was in flames. The fire had rushed up the well of the hoist and caught the roof. At each end of the building is a small tower with a battlemented base. Flames issued from one of these towers, while smoke poured from most of the windows of the different flats. Within an hour the fire seemed to have been got under control. Suddenly, however, there was a dull roar right in the centre of the building. Flames shot up high in the air, and pieces of stone three or four inches in diameter were thrown right across the street. There is no doubt that if the explosion—for it undoubtedly was an explosion—had occurred

ten minutes earlier than it did, the death toll would have been much greater.

PETERBOROUGH CATHEDRAL.—The Dean and Chapter of Peterborough Cathedral have requested Mr. G. A. Bodley, A.R.A., to examine and report upon the condition of the west front of the cathedral, and also of the transepts and eastern chapel of the choir, with a view to carrying on the work of restoration. This course is necessary, owing to the death of Mr. J. L. Pearson, under whose advice the previous restorations had been carried out. Scaffolding is being erected with a view to restoring the south-west gable of the front.

CAPITAL AND LABOUR.

LANCASTER JOINERS' WAGES.—The master joiners of Lancaster have been served with a notice from the local joiners' associations, in which they are asked to concede a reduction of hours, an increase of wages, and an alteration of the boundary line. A representative of the *Lancaster Standard* waited upon one of the officials of the Union, and from him learned that at the present time the joiners in the town work 5½ hours per week, being paid at the rate of 7½d. per hour. They now ask that the time shall be reduced to 4½ hours, and that the wages be increased to 8d., the total advance represented being 1d. There are only three towns in Lancashire which are said to be situated in a position similar to that of Lancaster, such as Ulverston and Southport, in all the others the men work about the same hours, but receive 7½d. an hour more wage. The notice will not take effect until the last Friday in June, it being a six months' notice, and the men affected will number close upon 200. There are two local branches of societies, the Amalgamated Society of Carpenters and Joiners, and the General Union of Operative Carpenters, who combine in the case of a trade dispute.

LIVERPOOL PLASTERERS' STRIKE.—After two conferences under the presidency of the Lord Mayor, the Master Plasterers' Association and the Operative Plasterers' Society have decided to submit the three following matters in dispute to arbitration—viz., the apprentice question, the country rule, and the expiration of notice. They have also decided that the Lord Mayor should be invited to act as sole arbitrator, and his lordship has accepted the position. An assurance from each side agreeing to abide by the decision of the arbitrator is to be given, after which a joint meeting will be held for the consideration of the points of difference.

WAGES OF PORTSMOUTH CARPENTERS.—In accordance with an agreement arrived at in the summer between the master builders and the carpenters of Portsmouth, the latter will receive an increase in wages of a halfpenny per hour, dating from January 1.

LEGAL.

BAD MORTAR.

CHARLES ARTHUR COOK, a builder, appeared at the West London Police-court, on the 7th inst., to answer the complaint of the Acton Urban Council for using bad mortar in the construction of four houses in Colville-road, South Acton.—Mr. Hemsley, who represented the Council, said there were four summons.

It was stated by the defendant that it was the finest mortar in London. Mr. D. J. Ebbitt, the Surveyor, produced some samples which appeared black and crumbled to powder between his fingers. The by-laws of the Council required the mixture of clean sharp sand with lime, and it was stated that the defendant used foundry refuse. It was stated by experts that the use of mortar of that description affected the stability of the buildings.

Mr. T. E. Knightley, the District Surveyor of Hammersmith, gave evidence in condemnation of the mortar and produced samples of good mortar to show the difference.

The defendant said the rain had washed the lime out of the mortar of which samples were produced. Foundry ashes made good mortar.

Mr. Knightley said foundry ashes crushed and mixed with lime would make good mortar, but they were quite different from foundry refuse.

Mr. Rose was of opinion that it was bad mortar, and said the Council were quite right in taking proceedings to prevent the use of it in the construction of houses. He inflicted penalties, with costs, amounting to 7l. 9s.—*Daily News*.

THE CLAIM AGAINST THE ST. PANCRAS GUARDIANS.

The case of Drew Bear & Co. and others v. the Guardians of the Poor of St. Pancras again came before Mr. Justice Ridley in the Queen's Bench Division on the 14th inst., for the assessment of the damages to be paid by the defendants to the plaintiffs in respect of certain breaches of contract found by the Court of Appeal in connexion with the building of the St. Pancras workhouse.

The history of the case has been fully reported in former issues (see the *Builder* for November 21 and 28, and December 5, 1896, and January 23 and 30, March 6 and 13, April 17, and May 22, and November 6, 1897).

Mr. R. M. Bray, Q.C., and Mr. A. A. Hudson appeared as counsel for the plaintiffs, and Mr. English Harrison, Q.C., and Mr. William Moyes for the defendants.

Mr. Bray, in the course of his opening remarks, explained the different heads under which damages were now claimed. The first stated that, in consequence of the contractor not being able to have full and complete possession of the site, and not being allowed to continue in possession thereof, and the failure to get possession of Block A within six months from the date of the contract, caused the labour to exceed what should have been its proper cost by at least 25 to 30 per cent., being an excess of from 10 to 12½ per cent., exclusive of any rise in the price of labour or any excess of price paid for materials from the same cause, say 12½ per cent. The plaintiffs reckoned the labour at 28,631l., the defendants' experts, however, putting it at about 26,000l., but for the plaintiffs' purposes of claim the former sum was assumed, and the item of damage under this particular head worked out at 6,357l. 1,210l. was also claimed for the increased price of labour paid for materials from and after September 1, 1893, when there was a general rise in wages of a ¾d. an hour, plus 12½, the 10 per cent. profit which a contractor looked to obtain; 1,000l. was also claimed as loss sustained by the contractor in making good work injured by sub-contractors and for interference by sub-contractors; 7,555l. 10s. 10p. was claimed for materials claimed for increased price in materials from September 1, 1893, occasioned by the general rise in prices; again, 3,814l. was claimed as establishment charges, increased price of plant, and cost of supervision by 7½ per cent. on the contract; under another head 1,250l. was claimed as 1½ years' pay, at the rate of 1,000l. a year, by reason of the contractor being obliged to give his attention to the undertaking in question for eighteen months longer, owing to delay, than was originally estimated and allowed. A further sum of 1,250l. was claimed on the ground that the contractor had to employ additional capital over a much longer period which involved increased interest on considerable sums of money remaining idle. The last claim was one for 160l., being 10 per cent. loss of profit on the portion of contract for the chaplain's room, &c., which had been estimated to cost 1,600l. These items amounted in the aggregate to 16,837l.

Mr. James Brown, builder, of Cannon-street, E.C., examined, said he had carefully gone into the estimates of damage occasioned by alleged breaches of contract. The first item, 6,357l., under heads A and G, was set down for increased outlay caused by increased price of labour, due to difficulties in working. The most important factor in such a contract was that the contractor should be given uninterrupted possession of the site. In this case the area was comparatively limited, and there was a considerable rise towards the north-east. It was therefore almost impossible for a builder to commence operations except in one way, namely, to secure a clear point at an early point, and then be able to level the whole site down to a common plateau. This would save expense and labour, and would enable the foreman to keep his men together. He (witness) did not doubt that the contract price was amply sufficient to complete the work. The conditions on which the contractor was engaged to build Block C were impracticable. The fact that the mortar mill had to stand on a mound 7 ft. or 8 ft. high was most inconvenient. As the old buildings were pulled down there was absolutely no space on which to stack and sort the old materials, portions of which were to be re-used in the new works, and moreover, the builder was confined to one out of four blocks, so that the men could not be shifted to a second block in case of any stoppage. He estimated that the labour bill for work carried out in this fashion would cost at least a third more than if done in the ordinary way.

Mr. Bray: Suppose, for the sake of argument, that the agreed amount of the labour bill was 28,631l., what would the amount of damage be?

Mr. English Harrison objected to any question of figures being gone into; and, after some argument, it transpired that the defendants claimed that the labour bill should be 26,000l., certain items of joinery done at Fulkstone being objected to.

His Lordship over-ruled the objection, and urged that both sides should agree on such a matter of figures as a labour bill.

The witness, further examined, said it would not be a third of the full amount, as he conceded that certain items, such as painting, whitewashing, and distemping, would not be affected, reducing the total to, say, 22,000l. He estimated the extra cost roughly at 7,000l.; but if the sum claimed by plaintiffs was 6,357l., that would not be an over-estimate. While the works were in progress there was in September, 1893, a rise of a half-penny an hour in various duties, also in materials, and these, of course, added to the cost. Passing on to the condemnation of columns in blocks C and H, the witness explained that if the builder had had possession of all the blocks the condemnation of iron columns in one block would not have materially delayed the work,

nor have made any difference, except in convenience. The whole of K block was carried out as an independent work after the blocks in front of it had been completed, and this certainly added to the expense. To these items should be added the profit of 10 per cent., which a contractor hoped to gain and which should have been more on this undertaking. The witness then referred to the delay caused by the well sinking, which prevented the builder from getting on with the work, and more time was lost in the diversion of water-mains from the site, while blocks C and H were cut about by the independent hot-water fittings. He estimated the damages for these three sources at 1,000*l.* As to increase in establishment charges, Mr. Brown explained that they should come to 5 per cent., but in this case, owing to delay, they would be doubled. The plant should have done two such jobs, but to double the time was equal to its use on two contracts, and he should add another 2½ per cent. for this item, and something more should be added for supervision. Another 10 per cent. had to be allowed on the chaplain's house, which was not carried out by the contractor, and which building had been estimated at 1,600*l.* for this item another 600*l.* should therefore be allowed. A further sum of, say, 1,000*l.* a year should be allowed a contractor if he was kept on such a contract two and a half years instead of fifteen months. When the trustees took on the contract, materials valued at 4,000*l.* were taken over, and a large proportion of those materials were held over owing to delay, and this continued all through the contract. For this, and the delay in paying over the retention money, another 1,250*l.* should be allowed.

Mr. Brown was then cross-examined by Mr. English Harrison with a view to show that the difference in levels between the available entrance and the point witness would have preferred was not so great as had been suggested. The witness said that many of the old buildings were pulled down before he saw the site. Instead of having but one entrance there should have been three or four and at the least two. The witness stated that he did not think Mr. Fearon ought to be satisfied with 3 per cent. for establishment charges, because he did not consider it was enough. A country builder had some advantages and some disadvantages over a London builder, as he had on a London job a long way to get to the work and supervision was difficult. On the other hand, his clerks received less salary; but that was counter-balanced by the builder being a distance from the work. He had been a country builder himself, and he knew exactly where the shoe pinched. A country builder ought to charge more for establishment charges on a London job than he ought to do on a local job. He (witness) saw the plant at the end of the job. The scaffold poles and scaffold boards were used in erecting the brick work. After the blocks had been roofed, they continued up round the different jobs while all the pointing, &c., was done. When he first went on to the job, B block was half way up. One or two blocks were scaffolded at the same time, and he said there ought to have been three or four. Part of the plant he took himself, but he could not say how much; he had forgotten. He, of course, allowed for it.

Mr. Bray remarked that he could give the figures if necessary.

The witness explained that the matter had never been settled except as to a question of amount between the trustees and himself. He thought that the scaffold poles were allowed for at a shilling apiece, but he could not say how many there were. In the cost of supervision in establishment charges he had included a general foreman, but not a working foreman. Their wages were included in the 21,000*l.* which he had increased by one-third.

Are not the general foreman's wages included in that?—I cannot tell you that. I think one man was included in that as far as my memory serves.

The witness further stated that, in his opinion, Mr. Brooks was entitled to be paid for supervision, even though he did not, in fact, supervise or come to the job, because his establishment was entirely occupied by carrying on the work. Even if Mr. Brooks left the matter to Mr. Fearon, he (Mr. Brooks) was entitled to be paid, because, by doing the job, he was prevented from carrying on other work. In witness's business many jobs were carried on from beginning to finish, and he (witness) never saw them. They were carried on by men in his employ, and that was the *modus operandi* of all builders in a large way of business.

But if the builder is only in a small way of business, that would not be true? But Mr. Brooks did look after his business down at Folkestone.

Cross-examination continued. He thought that Brooks ought personally to have increased remuneration, although he did not superintend the work at St. Pancras.

The witness stated that he should like his lordship to know that the creditors had found 4,000*l.* worth of materials after they took up the contract in April, 1893, for which they had never been paid.

Mr. Harrison: Do you put down the breaking of Mr. Brooks in April, 1893, to his not getting possession of the site?—Partly.

Re-examined by Mr. Bray:

The trustees of the creditors took the place of Mr. Brooks.

And the creditors had to find the money?—They did find it.

And accordingly, in that way, the creditors are out of their money?—They are out of it.

In further re-examination by Mr. Bray the witness said that their complaint was that the stables and chaplain's room ought to have been done during the fifteen months over which the contract was to run. If the job took two and a quarter years instead of one year the builder made so much less profit, and that was practically what they were claiming for.

Mr. Fearon, called and examined, said he had investigated the damages in the case, and he had prepared the plans which were before his lordship, which were all correct. If he had had immediate possession of the whole of the site at first he should have boarded round the whole of the space, as per contract; he should have made an entrance at the north end of Kings-road, as per contract; and he should have excavated the whole of the site to the required levels. The entrance given to them in Oxford-row was objectionable because he could only get one cart in at a time under the most advantageous circumstances. The total amount of the labour-bill was 28,631*l.* Of that, about 2,000*l.* was at the shop for joinery work, and things of that kind, and not at the works. After making allowances, the labour-bill had been taken at 22,000*l.*, which witness agreed was about correct. He considered that, owing to the delay in getting possession of the site, the most of the 22,000*l.* was affected; he should put it down to at least 30 per cent. He agreed with Mr. Brown's evidence with respect to shifting gangs of men from one building to another, but he thought that gentleman was a little under the mark rather than over. He put the loss sustained by the contractor, by the sub-contractor's work, and from interference by sub-contractors, at 1,500*l.*

After September 1, 1893, when the works should have been completed, there was an all-round rise of 10 per cent. on all materials and labour, due to advances granted in the May of that year; of course, all increases of wages and in cost of timber, slates, and bricks, which occurred between May and September, while the contract was in progress, was borne by the contractor. The total amount, as shown in many cases from invoices produced, was 1,750*l.*, and on this he was entitled to another 10 per cent. as profit, or 150*l.* He had estimated the establishment charges 3 per cent., and this should be charged for all the additional time involved.

Mr. Harrison objected to this evidence, as it necessarily included the delays due, as was admitted, to the acts of the architects and their clerks of works, and by the judgment of the Court of Appeal he submitted that his lordship was prohibited from going into any question as to the consequences of the acts of architects.

His lordship replied that he should not allow the judgment of the Court of Appeal to hamper him in trying the case. The common-sense plea, and the one he meant to follow, was to hear the evidence as to all delays and interference, and to make a deduction for everything due to the acts of the architects and their clerks of works, allowing the plaintiffs only the sums due, if any, to the acts of the Guardians. He would, however, make a note of the learned counsel's objections.

The witness, further examined, said that his own salary as manager was 350*l.* a year, and Brooks's average profits for the three years preceding 1893, as shown by balance sheets made out before the contract stopped (produced), was 1,250*l.* a year.

(Cross-examined.)

The particulars of claim already filed in Court were rough calculations made since last July, and the figures given were detailed estimates made during the past week. He adhered to all the evidence given at the previous trial. The witness was closely pressed as to the ground plans, submitted with a view to show that they were inaccurate as to the basements of the old work and also to show that another and more convenient entrance could have been used. He was also cross-examined as to the price of materials and wages paid, and produced his books and receipts. Some of the most striking balance sheets were found on completion of works begun in previous years, and in the same way other expected profits on works were carried forward.

Mr. John Thomas Chappell, examined, said that he was a contractor of thirty-five years' standing, but now out of business. He had carried out several large works, including Cane Hill Asylum and Mansions (80,000*l.*), General Post Office (140,000*l.*), and Colonel North's house at Eltham (over 80,000*l.*).

Witness had examined the St. Pancras Workhouse and had inspected the contracts, plans, and specifications. The difficulty of getting possession of site and entrances on convenient levels would disorganise the whole business, and materially affect the opportunity of making a profit. The witness described in detail the order in which he should have carried out the works, provided the site was placed at his disposal uninterruptedly. The entrance provided was in a dangerous situation, and was the worst portion of the site. Again, the organisation of the men, and turning them from one block to another, was every

thing in an extensive contract. If bricks were condemned for facings, but could be utilised for internal work, as alleged, it would obviously have been a convenience if there had been space. There was some waste in handling such materials as bricks, due to want of space; but the major portion of the loss would be in labour, which was greater than would appear at first sight.

Mr. H. Holloway, a builder, of Battersea, and Mr. W. H. Bartlett, a contractor, and a partner in the firm of Perry & Co., of Tredgar Works, Bow, also gave evidence in support of the plaintiffs' case.

The hearing of the case had not concluded when we went to press.

WEST END LIGHT AND AIR CASE.

THE case of *Speirs v. Tweeddale* came before Mr. Justice North in the Chancery Division, on the 11th inst., on a motion by the plaintiff for an injunction to restrain until the trial of the action or further order the defendant, the Marquis of Tweeddale, from erecting a wall, or allowing any erection to remain on his premises, No. 6, Hill-street, Berkeley-square, so as to interfere with the light and air coming to plaintiff's premises, No. 4, Hill-street. In the course of the opening statement Mr. Macnaghten, counsel for the defendant, interposed and said that it was not proposed to go any higher with the wall at present, although the defendant intended to put a room at the back of it.

His lordship pointed out that in this case there was nothing for him to do on the motion then before the Court, and ultimately it was ordered to stand till the trial, the defendant undertaking not to go higher with the wall, there being no order made on the motion except that costs be costs in the action.

LONDON COUNTY COUNCIL v. J. WILSON.

AT the West London Police-court on Saturday last, Mr. Rose disposed of a batch of 105 summonses against Mr. Joseph Wilson, a builder, issued at the instance of the London County Council, with reference to the erection of twenty-one houses in Stephendale-road, Tounmend-road, Fulham.

The cases were formally opened some time ago and had since been standing over for an arrangement. The complaint against the defendant was that he used in the erection of the houses bad mortar and bricks, and had been guilty of other offences under the Building Act.

Mr. Seager Berry, who represented the Council, said the defendant had carried out remedial works and was doing all he could loyally to complete them. He (Mr. Berry) left the matter in the hands of the magistrate to fix the penalties and costs.

Mr. Macmorran, Q.C., for the defendant, agreed to the arrangement, but mentioned that the remedial works had cost him 1,000*l.*, which was rather hard upon him, as the houses were erected under the supervision of the District Surveyor.

Mr. Rose then fixed nominal penalties in each group of summonses, amounting in the whole to 4*l.* 4*s.* with 18 guineas costs.

Asked by Mr. Berry to express an opinion on the case, Mr. Rose said as far as he had the opportunity of judging the proceedings were properly taken.—*Daily News.*

MEETINGS.

FRIDAY, JANUARY 14.

Architectural Association.—Mr. F. T. Raggallay on "Composition in regard to Public Buildings." 7.30 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. R. Gordon Mackay on "Mechanical Draught." 8 p.m.

MONDAY, JANUARY 17.

Royal Institute of British Architects.—Award of Prizes and Studentships, preceded by a business meeting. 8 p.m.

TUESDAY, JANUARY 18.

Institution of Civil Engineers.—Resumed discussion on "The Machinery used in the Manufacture of Cordite," by Mr. E. W. Anderson. 8 p.m.

WEDNESDAY, JANUARY 20.

British Archaeological Association.—Mr. W. D. Hoyle on "Ancient Houses near Halifax." 8 p.m.
Society of Arts.—Mr. Eric Stuart Bruce, M.A., on "The Projection of Luminous Objects in Space." 8 p.m.
Builders' Foremen and Clerks of Works Institution.—Annual meeting of the members. 8 p.m.
Perth Architectural Association.—Mr. John Smart on "Reasonable Supervision." 8 p.m.

Northern Architectural Association.—Mr. G. T. Brown on "The Stones Used for Building Purposes in Northumberland and Durham." 7.30 p.m.

THURSDAY, JANUARY 20.

Society of Antiquaries.—8.30 p.m.
Institution of Civil Engineers.—Students' Visit to the Central London Railway Works, by permission of Sir Benjamin Baker. Assemble at Notting Hill Gate Station. 2.30 p.m.

SATURDAY, JANUARY 22.

Royal Institution.—Professor Patrick Geddes on "Cyprus." 1. 3 p.m.

FROM THE WHARF

3,496.—COMBINED SASH GRIP AND SAFETY GRIDER, FOR USE IN WINDOW-CLEANING: *W. E. Wright*.—The grip comprises a vertical screw fixed to a swell, and a vertical plate having a serrated or grooved ledge or flange, at the base end of the screw is an eyelet or loop, and on the other end of the screw is a nut or flange, and a rope connects the eyelet or loop to a belt around the cleaner; the flange bears against the internal sash, and the nut or flange is rotated until the sash is clamped between it and the frame.

3,412.—FUEL CONSUMPTION IN OPEN FIRE GRATES: *R. C. Shapcott and H. E. Brown*.—Fuel is economised by using at the back of the stove a bridge or support, which has an inclined or vertical flat or nozzle, curved inwards, perforated for admitting heated air to the fuel; the bridge is made, preferably, of fire-clay or some analogous material, moulded with insertions of wire.

3,382.—URINALS: *J. Shank*.—The back and sides of each urinal can consist of a single slab, concave in vertical section at the upper portion, curved forward at the lower part, and extending to a straight edge, touching the inner side of a gutter, formed to make a continuous curved surface with the slab's lower part; also a water nozzle, curved inwards and having a flat lip to spread water in a film.

3,389.—SAFETY APPLIANCE FOR LIFTS: *R. Wright*.—The invention consists of an automatic grip for the hand-ropes or chain, combined with an expansion spring which places the grip in action, and a lever for releasing the grip.

3,518.—FOR TYING AND BUILDING SCAFFOLDING: *J. F. Ryan and others*.—The apparatus includes a standard iron, gantry blocks and irons, ledger hook and chains, and bracing the beams or cross-pieces. The standard iron has a plate or strap which is held on to the upright pole by a fixing chain, the ledger or cross-pole is secured to the standard pole by an iron link and a tying chain, the former being a hook connected to the standard pole, and the latter by rings to a hook upon the standard iron, and passed over the ledger iron hook, and so on, around the ledger and standard poles, backwards and forwards, through the hooks of the standard and ledger irons, until its length is exhausted.

3,183.—WORKING STONE, MARBLE, GRANITE, &c.: *C. Hergenhan*.—The inventor claims to substitute a ground article for one with a chipped or chiselled face. He grinds the lower or dressed surface with large power-driven discs made of iron or steel or carbide, metal grit, emery, &c. His smaller profile-cutting or milling discs and rollers have their operating surfaces grooved or perforated with hollow file marks like the grinding machine.

3,179.—SASH-FASTENERS: *W. Fletcher*.—In the inner sash-rail is let a metal box carrying a key, whose handle projects into the room; the other end of the key has a bevelled head, the handle being connected by a chain to a plate screwed on to the inner face of the outer sash. The window is fastened by passing the key into the counter-junk hole, and then turning it (a spring inside the key-box carries the key into position) or hooks. The standard iron has a plate or strap which is held on to the upright pole by a fixing chain, the ledger or cross-pole is secured to the standard pole by an iron link and a tying chain, the former being a hook connected to the standard pole, and the latter by rings to a hook upon the standard iron, and passed over the ledger iron hook, and so on, around the ledger and standard poles, backwards and forwards, through the hooks of the standard and ledger irons, until its length is exhausted.

3,157.—JOINING CEMENT BLOCKS, PIPES, &c.: *S. O. Kjellström*.—The improvement consists in embedding the iron connecting bars completely within the body of the block or pipe, to prevent its being loosened by oil or fluid contact. The bars are secured by cement filling, by a plate screwed on to the inner face of the outer sash. The window is fastened by passing the key into the counter-junk hole, and then turning it (a spring inside the key-box carries the key into position) or hooks. The standard iron has a plate or strap which is held on to the upright pole by a fixing chain, the ledger or cross-pole is secured to the standard pole by an iron link and a tying chain, the former being a hook connected to the standard pole, and the latter by rings to a hook upon the standard iron, and passed over the ledger iron hook, and so on, around the ledger and standard poles, backwards and forwards, through the hooks of the standard and ledger irons, until its length is exhausted.

3,251.—SANITARY EARTHENWARE PIPES: *H. Cottrill*. A joint between two pipes is effected by means of a screw or helical thread on the spigot end of each pipe and a corresponding screw thread inside the socket end thereof, so that the pipes may be joined by screwing.

2,445.—SPIRIT LEVELS AND CLINOMETERS: *A. and K. Polzinkler*.—On the level's straight edge is fixed a continuous circular (i.e., annular) tube containing the liquid with bubble, set in a similar plate graduated with marks or degrees, the zero mark being at a true right angle with the straight edge.

2,861.—MATERIAL FOR THE CONSTRUCTION AND DECORATION OF BUILDINGS: *D. H. Ferguson*.—The material is composed of separately and distinctly coloured mineral fibrous (preferably asbestos) portions packed together and treated with silicate of soda and calcium chloride; the colours are artificially produced and the composition is claimed to be fire and water proof, lighter than stone, a good non-conductor, and capable of being sawn into veneers.

2,556.—STONE-SAWING MACHINES: *R. Knebel*.—The inventor adopts an endless cable, with means for automatic regulation, the cable being connected to a motor, and a truck mounted on an inclined track and carrying an idler over which the cable passes, the truck serving to adjust the idler to compensate for the slack produced by the sinking of the cable into the stone.

NEW APPLICATIONS.

For the interval December 28-31.

30,571, W. P. Kelly, Articles of China, Delph, Glass, and such like. 30,579, S. Jacques, Manufacture of Paper. 30,591, R. A. Kneeland, Wheel-barrows and like Vehicles. 30,594, A. C. Bell, Fire Prevention Apparatus. 30,605, J. Wyman, an Automatic Gas Cut-off in Cooking Stoves; also 30,607, Gas Tap for same. 30,610, W. P. Pether, Fire Extinguishing Appliances. 30,614, J. S. Hainworth, Double Extruder Swing Doors. 30,617, A. Elkan, Window Shades and Blinds. 30,629, J. Grossmann, a Method of Treating Sewage. 30,632, S. Henderson, tons, 30,648, Armstrong and Weaver, Computing Scales. 30,648, D. I. Prudden, a Safety Mechanism for Elevators. 30,659, R. Landauer, Self-acting Gas Lighting and Extinguishing Devices. 30,665, F. J. Smart, a Wire Fire-proof Shutter. 30,705, A. Sheldermire, Glazed bricks and the like. 30,728, H. B. Safety Hoists for Lifts &c. 30,729, W. Essex, Door Locks; also 30,736, L. Silverman. 30,763, E. Rhind, Hot and Cold Water Supply or Service Fittings for Baths, Tanks, &c. 30,785, G. E. Eland, a Dry Timber, Bricks, &c., and a Safety or Ventilating Apparatus and the like. 30,792, J. F. O'Brien, Mechanism for turning off the Supply of Gas or other Illuminant at a Pre-determined Time; also 30,806, J. C. Manning. 30,798, Delamara and Hild, Pavements, Floors, Stairs, &c. 30,799, Stead & Rhodes, Stone Cutting. 30,805, Adkins, Window and other Glass Cleansing. 30,809, H. S. Phillippe, a Foot-Rule and Set Square. 30,810, J. C. Manning, the Treatment of Metal for Roofing and for Inside and Outside Wall Purposes. 30,817, E. V. Johnson, Grain Elevators. 30,823, A. C. Taylor, Trussing Devices for Roof Trusses and Rafters. 30,824, J. C. Manning, Irons. 30,830, E. Le Maire, Mechanism for Opening and Closing

Sliding Doors and Windows. 30,835, P. T. Sievert, Slabs or Sheets of Glass with Inlaid Wire. 30,843, P. M. Beaumont, Sewer Ventilation. 30,858, A. E. Pinfold, Compositing Pumice. 30,867, R. R. Lawson, Cocks and Water-Gauges. 30,869, S. M. Rattagur, Ventilation of Buildings. 30,873, A. Paternoster, Tiles. 30,880, G. P. Clark, a Flexible and Adjustable Ruler for use in Drawing Curves. 30,892, J. Wetter, Wire Nails. 30,896, A. C. Hyde, Knobs and Handles for Doors. 30,900, H. Borchardt, an Automatic Gas Lighting Contrivance. 30,909, G. F. W. Hope, Excavating or Dredging Apparatus. 30,910, R. H. Read, Balances. 30,923, F. J. Sprague, Electric Elevators. 30,924, Temper, a Load-Releasing Apparatus for Use with Hoisting Machines. 30,928, E. Queitsch, Parquet Flooring.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 5.—By BRADSHAW BROWN & CO. Bromley-by-Bow, 35 to 45 (odd), Yatan-st., u.t. 77½ yrs., r. 15s. £1,380

January 6.—By G. B. HILLIARD & SON. Febmarsh, Essex.—Three enclosures of land, 21 a. 2 r. 10 p. r. 15s. 215
Essex.—The Manor of Febmarsh and Dagworthy, with its rens, rights, royalties, &c. 900
The Manor of North Weald, with its rens, rights, royalties, &c. 1,550

Contractions used in these lists.—F.g.t. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		TIMBER (continued).	
Greenheart, B.G.	8/10	Satin, Porto Rico	0/15
Teak, E.I., load	12/10	Walnut, Italian	0/15
Surinam, U.S. f.c.	1/8	1/8	0/15
Ash, Canada, load	3/10	Iron—Pig, in Scot-	
Birch, do.	4/10	land—Long ton	2/17
Elm, do.	4/10	Bar, Welsh, in	
Fig, do.	3/10	London	5/15
Oak, do.	3/10	Do. at works	5/15
Plane, Canada red	0/10	Do. Staffordshire,	
Do. yellow	2/10	in London	6/10
Larch, Danzig, 10 ft.	4/10	COPPER—British	
St. Petersburg	5/10	Sheet selected	3/10
Walnut, Riga	2/10	Best strong	0/10
Odesa, do.	2/10	Chill bars	0/10
Do. and st. and roo	7/10	YELLOW METAL	
Do. and st. and roo	8/10	Desk	41d.
Do. and st. and roo	9/10	Spanish	10/15
Do. and st. and roo	10/10	English com-	
Do. and st. and roo	11/10	bands	13/10
Do. and st. and roo	12/10	Sheet, English	
Do. and st. and roo	13/10	lbs. per sq. ft.	
Do. and st. and roo	14/10	and upwards	13/10
Do. and st. and roo	15/10	Pipe	14/10
Do. and st. and roo	16/10	2 1/2 c.—English	
Do. and st. and roo	17/10	sheet—ton	30/10
Do. and st. and roo	18/10	Vulcan Mon-	
Do. and st. and roo	19/10	tague	21/10
Do. and st. and roo	20/10	Spelter	20/10
Do. and st. and roo	21/10	tin—Strait	6/10
Do. and st. and roo	22/10	Australian	6/10
Do. and st. and roo	23/10	British ingots	6/10
Do. and st. and roo	24/10	Banca	6/10
Do. and st. and roo	25/10	Bullion	59 1/2
Do. and st. and roo	26/10	OILS.	
Do. and st. and roo	27/10	Lined	15/10
Do. and st. and roo	28/10	Cocoon, Cochiti	27/10
Do. and st. and roo	29/10	Do. Cayenne	10/10
Do. and st. and roo	30/10	Palm, Lagos	21/10
Do. and st. and roo	31/10	Rapeseed, Engle-	
Do. and st. and roo	32/10	land	27/10
Do. and st. and roo	33/10	Do. Brown	26/10
Do. and st. and roo	34/10	Do. Yellow	26/10
Do. and st. and roo	35/10	Oilseed	14/10
Do. and st. and roo	36/10	Lubricating	0/15
Do. and st. and roo	37/10	Do. Black	0/10
Do. and st. and roo	38/10	Archangel	6/10
Do. and st. and roo	39/10	Turpentine	24/10

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

ABERDEEN.—Accepted for taking down and re-erecting walls, Berry-road, for the Town Council. Mr. Wm. Dyck, Borough Surveyor, Town House, Aberdeen. £88

Call & Walker, 45, Richmond-street, Aberdeen. £88

BROMLEY (Kent).—For the erection of new premises for Martin's Bank, Limited, and shop for Mr. R. Taylor. Mr. Ernest Newton, architect:—

Martin's Bank. Shop Premises.	
R. A. Lowe	£4,040
Arnold & Son	3,985
Colts & Son	3,985
Croft & Son	3,900
Payne	3,900
T. D. Gray	3,825
Patman & Fotheringham	3,825
Maid & Harper	3,775
F. P. Dutton (Bramley)	3,697

Accepted.

* The last application for the year 1897 is numbered "0 p. 66," the applications in 1896 amounting to 30,194, of which 55.75 per cent. were not called further.

BRIDLINGTON.—For the erection of dwelling-house, stable, &c., Carlton-street. Mr. J. Smith —
James Walker.....£475 J. Sawdon.....£359
W. Barnes.....381

BUSHEY HEATH.—For alterations and additions to Powis Lodge, Bushey Heath. Messrs. Higgs & Rudkin, architects, 25, John-street, Bedford-row. Quantities by Mr. Alan Paul, 6, Quality-court, Chancery-lane:—

Parfit & Co.	£1,534	J. Smith & Sons	£1,289
W. Wall & Co.	1,295	Wm. Wade (accepted)	1,289
Wm. Bailey	1,295		

CARDIFF.—For alterations and additions, 299, Bute-street, Cardiff, for Mr. J. Lewis. Messrs. Harbison & Fawcner, architects. Quantities supplied:—

J. Beer & Son	£83	C. Hayward	£40
C. Price & Sons	179	A. J. Howell & Co.	455
Shepton & Son	458	Melhuish Bros.	415
Knox & Wills	455		

Accepted.

HUDDESFIELD.—For the erection of seven houses, Moor-lane, Netherthorn. Mr. J. Berry, architect, 9, Queen-street, Huddersfield:—

Masonry.—W. Pearson & Son, New-street, Netherthorn	
Plumbing.—J. Hebblethwaite, Road-side, Netherthorn	£1,700
Painting.—W. Jessop, Netherthorn	
Joining.—W. Littlewood & Son, Netherthorn	
Carpeting.—J. Cooke, Little Royd, Huddersfield	

KINGSTON-ON-THAMES.—Accepted for additions to the Royal Court Theatre, for the Directors of the Kingston-on-Thames Theatre Co., Limited. Mr. J. Charles Bourne, architect, 62 and 63, Basinghall-street, E.C.:—

Kirk & Kirk, Westminster.....£395

LONDON.—For erecting the All Farthing-lane Branch of the Wandsworth Library, for the Wandsworth Library Commissioners. Mr. Henry Branch, architect and surveyor, 25, Cheapside, E.C. Quantities by the architect:—

G. & A. Smith	£2,701	Carmichael	£2,447
J. Cooper	2,437	Henry Branch	2,437
J. Gibbs	2,610	Turle & Appleton	2,448
R. Ronald	2,571	J. Turner	2,466
Farson & Co.	2,591	Johnson & Co., Limited	2,393
Holloway Bros.	2,519	Charles Horton (accepted)	2,400

LONDON.—For rebuilding the "Harp of Eric" beerhouse and No. 1, Watergate-street, Deptford, for the Anchor Brewery. Mr. John Jas. Downes, architect, 109, Lewisham High-road, S.E. Quantities by Mr. Henry Theobald:—

Lang	£4,671	J. J. Tarrant & Son	£4,066
H. L. Holloway	4,000	S. R. Best	3,590

LONDON.—For new kitchen and addition to dining-saloon at Odome's Restaurant, No. 124, Victoria-street, S.W., for Mr. G. Odome. Mr. Robert Wallis, architect, 33, New Bridge-street, E.C.:—

Patman & Fotheringham	£2,473	J. Bennett	£2,473
Lacelles & Co.	2,079	J. Tyrman	1,750
C. Goulthard	1,695		

LONDON.—For alterations to 151 and 153, Newington-causeway, S.E., for the Capital and Counties Bank, Limited. Mr. F. A. Powell, architect, 344, Kennington-road, S.E.:—

Colts & Sons	£3,170	H. Burman & Sons*	£2,647
J. Tyrman	2,800	Cannal & Mullins (with	
W. Downs	2,580	drawn)	2,587
W. Smith	2,757		

* Accepted.

LONDONDEERY.—For the erection of house in the city. Messrs. R. H. M. Elwes & Co., architects, 9, Canislie-road, London-deery:—

A. Dunlop, Little James-street, London-deery.....£134

MAIDSTONE.—For additions to the Council's offices, for the Corporation. Mr. F. Bunting, Borough Surveyor:—

George Pearce	£775	H. A. Thomas	£282
W. T. Burrows	295	W. J. Logan, Maidstone	255
Thompson & Chapman	293		

* Accepted.

MIDDLESBROUGH.—For the execution of street works, Kingston-street, for the Corporation. Mr. F. Baker, E.C., Municipal-buildings, Middlesbrough:—

Kingston-street.	
Jones's Annealed Concrete Company	£177
J. T. Dixon, Preston (accepted)	164

Samuelson-street.	
Jones's Annealed Concrete Company, Middles-	
brough (accepted)	£64

PONTPOOL.—Accepted for the erection of house near St. James's Church, for the Pontpool Wesleyan Methodist Circuit. Mr. D. Davies, architect, Springfield, Pontpool:—

Bailey Bros. Pontnewynydd, near Pontpool.....£367

(Including certain items found by the owners.)

PRESTATYN.—For the erection of superstructure of Royal Victoria Hotel, Prestatyn (Contract No. 3), for Mr. Martin O'Connor, Liverpool. Mr. Richard E. Hughes, architect. Quantities by Messrs. Humphreys & Moore, 134, Corporation-street, Birmingham:—

Roger Bateson	£2,765	Chas. Burt, Liver-	
Samuel Warburton	2,375	pool* (accepted)	2,003
W. S. Wood & Co.	2,000	R. Merton Hughes	8,872
		Branley & Lloyd	8,872

* Also carried out Contract No. 1 (foundations), amounting to £1,031, 12s. 3d.

TRIMDON (Durham).—For the erection of a board school, Trimdon Foundry. Messrs. James Garry, architect, 27, Church-street, West Hartlepool:—

J. Howe & Co.	£1,241	W. O. Russell	£1,619
J. Proud	1,268	W. C. Atkinson &	
Curry	1,260	Co., Stockton-on-	
Mannings	1,690	Tees (accepted)	1,410

WINLATON.—For building a dwelling-house and out-offices for Mr. R. Mawson. Mr. W. Allen, architect, 16, Ryton Village East, Ryton-on-Tyne. Quantities by architect.—

<i>Full Tender.</i>	
Davidson & Boland	£56 16 6
Excavating, Masonry, and Brickwork, and Drains, Carpentering and Joinery, Slatting and Plastering	£459 1 6
William Gibson	£459 1 6
Excavating, Masonry, Brickwork, and Drains	£454 13 0
M. A. Armstrong	£454 13 0
Carpentering and Joinery Work	£156 0 0
R. Smith	129 6 0
H. Wilson	115 5 4
R. Finlay	£45

<i>Slatting.</i>	
John Hewetson	24 0
H. Mead & Son	34 0
Kirk & Dickinson	23 10 0
E. Beck & Sons	115 5 4

<i>Plastering.</i>	
J. Chapman	£10 0 0
James Padden	41 10 0

<i>Plumbing.</i>	
J. C. Archibald	£79 15 5
J. A. Turnbull & Son	27 0 0
E. Johnson & Co.	19 10 0
E. Polley	15 0 0
F. W. Jefferson	18 0 0

<i>Painting and Glazing.</i>	
J. A. Turnbull & Son	£75 0 0
J. B. Dobson	16 10 0
W. Smith	12 7 31

WINLATON.—For building a dwelling-house, blacksmith's shop, and out-offices, for Mr. R. Mawson. Mr. W. Allen, architect, 16, Ryton Village East, Ryton-on-Tyne. Quantities by architect.—

<i>Full Tender.</i>	
Davidson & Boland	£773 9 10
Excavating, Masonry, Brickwork, Drains, Carpentering, Joinery, Slatting and Plastering	£589 8 7
W. Gibson	£589 8 7

<i>Single Tender.</i>	
Excavating, Masonry, Brickwork, and Drains	£593 8 0
M. A. Armstrong	£593 8 0

<i>Carpentering and Joinery.</i>	
R. Smith	£500 0 0
H. Wilson	151 10 4
R. Finlay	145 0 0

<i>Slatting.</i>	
J. Hewetson	£54 10 0
H. Mead & Son	51 10 0
E. Beck & Sons	51 0 0
Kirk & Dickinson	50 0 0

<i>Plastering.</i>	
J. Chapman	£50 0 0
James Padden	43 0 0

<i>Painting and Glazing.</i>	
J. A. Turnbull & Son	£13 0 0
J. B. Dobson	12 10 0
W. Smith	12 11 84

WORKINGTON.—For heating works, Central Stores, Jane-street, Workington. Messrs. W. G. Scott & Co., architects, Workington.—

Wm. Key	£570 0 0
John Grundy	417 3 0
T. Potter & Sons, Ltd.	275 0 0
W. G. Fox	370 0 0
Grubbs & Co.	364 0 0
Scholes & Co.	350 0 0
G. Barker & Son	320 0 0
Beckett Bros.	320 10 0
George Tankard	315 10 0
John Gibbs & Son	300 0 0
A. J. Kallaway & Co.	300 0 0
H. Walker & Son, Ltd.	300 0 0
A. Seward & Co.	300 0 0
Moorewood, Sons & Co.	300 0 0
R. Richardson & Co.	300 17 6
R. Dawson & Co., Ltd.	300 0 0
R. Crittall & Co.	285 16 0
Matthew McEwen	285 12 0

Accepted.

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Accepted.

WANSTEAD.—For the construction of 1,200 ft. 3-in. pipe-sewer, &c., for the Urban District Council. Mr. John T. Bressey, surveyor.

D. Brewer	£773 10 0
H. Williams	£450 0 0
W. Gibbs & Co.	545 1 0
H. Clarke	520 0 0
T. Adams	510 0 0
Joseph Jackson	470 0 0
French Bros.	470 0 0
J. Reeves	460 0 0
Grounds & Newton	£450 0 0
Jesse Jackson	444 0 0
I. Bull	415 0 0
H. L. White	400 0 0
W. Swaker	370 0 0
W. Manders	370 0 0
A. T. Catley, 28, Lloyd-square, W.C.	360 0 0

LONDON SCHOOL BOARD TENDERS.

The following lists of tenders were submitted by the Works Committee at the last meeting of the London School Board:—

<i>BRONDESBURY HALL (Iverson-road, N.W.)—Adapting for a school.</i>	
F. Britton	£185 0 0
R. A. Yerbury & Sons	170 0 0
Marchant & Hirst	137 13 0
Stevens Bros.	136 0 0
T. Cruys	£120 0 0
H. Eddy	110 0 0
W. Horne	110 0 0
F. T. Chichester	107 18 6

<i>MISSION HALL (Old Ford-road, E.)—Adapting for a temporary school.</i>	
A. E. Symes	£149 0 0
R. Barker	140 0 0
J. Dyson	135 0 0
D. Gibb & Co.	£133 0 0
J. T. Roby	120 0 0
J. F. Holliday	119 10 0

<i>WILMOT-STREET.—Altering boys' and girls' entrances.—</i>	
C. Wale	£115 7 11
Suk & Son	109 0 0
Harrison & Spooner	93 0 0
G. Barker	£81 0 0

* Accepted.

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VOL. LXXIV. No 2561

JAN 27, 1898.

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Surbiton Municipal Buildings: Design placed Third by the Assessor.—By Messrs. W. E. Hewitt, A.R.I.B.A., and A. H. Ryan-Tension, A.R.I.B.A.	Double-Page Photo-Litho.

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Mineral Statistics.



THE annual Blue-book* on our mineral statistics is always an interesting document, full of surprises, and figures of great practical value. We have in former years published short critical articles on it, and have had the satisfaction of watching the evolution of improvements in the method of presentation of the statistics, especially in regard to those minerals of chief interest to our readers. The Report for 1895 was more or less an experiment, in the sense that a new complexion was enabled to be thrown on the figures relating to the stone industry, as the Quarries Act had just come into force. By 1896 things had naturally become more settled, and we regret to see that what we had thought to be mere tentative arrangements incidental to dealing with a mass of new statistics have been adopted a second year, and have, therefore, to be regarded as more or less permanent. The heading "Stone, &c.," with its odd jumble of minerals, has, fortunately, disappeared, and in its place we find headings relating to "granite," "gravel and sand," "limestone (other than chalk)," "sandstone," and the like. This arrangement is a decided improvement, but we shall show that it does not go far enough and might be considerably amended to advantage. The figures will never possess their full value until those who collect the returns understand what the material they schedule is used for. We may add, that if the Acts at present in force are not strong enough to enable this information to be collected and published in some form, then they must be amended and more power given to inspectors. And now to proceed to the consideration of the statistics.

Next to coal, stone, in various forms, is the most important raw mineral industry in the country. Let us commence, therefore, with the different varieties of stone scheduled.

Granite.—The compilers begin by stating that the term granite is applied very vaguely

in commerce, and consequently some of the stone so called in the returns furnished to the inspectors is not entitled to that name when used in the strict geological sense. The diorite and quartz porphyry of Carnarvonshire, often sold as granite, are, nevertheless, separated in these statistics, and are included under "Whinstone, Basalt, &c." Of the quartz porphyry we have nothing to say, but why the diorite should be excluded in the manner indicated we know not. A large quantity of stone included in these statistics as "granite" is not more closely allied to that rock (*sensu stricto*) than is the diorite alluded to.

Then follows a sentence which we are quite at a loss to understand:—"Some quarry-owners even apply the name granite to hard grit or sandstone; as far as known,* all returns of this description have been relegated to their proper place under the heading 'Sandstone.'" Are we to understand that those who are responsible for the compilation of this work have no means of ascertaining whether the produce of a certain quarry is granite or sandstone? Cannot the inspectors tell the difference between these two elementary rocks? And this in an official publication too!

We glance down the granite-returns. What sort of "granite" comes from Yorkshire and Somerset? Why is there no attempt to classify the granites according to their uses? Here we find the beautiful blue "granites" of Aberdeen, used very extensively for monumental and polished work, placed side by side with the rough hornblende granites, syenites, and altered diorites of Leicestershire used almost exclusively for surveyors' purposes. The "granites" from Aberdeen and Leicestershire have nothing in common save that kerbs and pitchers are made in both districts. To a large extent the trades are different, and the mineral is certainly different.

Taking the figures as they stand, however, we learn that during the year, Cornwall produced granite of the value of 38,002*l.*, Cumberland 21,650*l.*, Leicester 219,776*l.*, Aberdeen 117,505*l.*, Argyll 17,336*l.*, Kirkcubright 34,999*l.*, County Down 10,675*l.*, and some other counties yielded a smaller quantity. The total figures for granite for the United Kingdom for the year are 1,756,816 tons, valued at 498,074*l.*

* The italics are ours.—Ed.

Sandstone.—The counties of Lancaster, York, Glamorgan, Edinburgh, and Lanark are the chief producers. The totals for the year are 4,507,745 tons, valued at 1,417,985*l.* These figures include gannister from the Coal Measures, and also part of the stone returned as "freestone." No attempt is made to classify the sandstones, either according to their geological age or to specific uses. We have, therefore, the sandstones used by the architect mixed up with those exclusively employed by the surveyor.

Limestone.—The compilers remark that even without taking chalk into account, limestone appears to be the most important mineral which is quarried in this country, "Its uses are so various, and it is found so abundantly, that this fact need cause no surprise; it is wanted by the farmer, the builder, the iron-smelter, and the chemical manufacturer." That is perfectly true; yet in these returns no attempt is made to estimate the quantities and values that are to be assigned to the users mentioned. The immense quantities of limestone burnt in the manufacture of lime are inextricably mixed with that used for building purposes, thus we are quite unable to ascertain from this Blue-book as to the relative production, and so to ascertain whether there has been any falling off or increase in any particular section. What is the practical value of mineral statistics unless they enable us to judge of such matters as these? The totals for the year are—11,011,350 tons, valued at 1,215,604*l.*

Chalk.—"Kent is by far the most important chalk-yielding county, and much of its produce is employed in the manufacture of Portland cement at works on the banks of the Thames and Medway." The total output for the United Kingdom during the year was 3,559,229 tons, valued at 157,170*l.* Of this, Kent is responsible for rather more than 2,365,541 tons, valued at about 94,100*l.* Essex and Hampshire are the next important producers.

Whinstone, Basalt, &c.—This section includes igneous rocks not referred to under the heading of "granite," and practically all the stone is used for road metal and paving purposes. The enormous quarries in Carnarvonshire yielding 385,494 tons, valued at 112,867*l.*; Shropshire, 190,979 tons at 26,874*l.*; Staffordshire, 159,953 at 36,476*l.*; Warwickshire, 198,034 at 29,505*l.*; York-

* "Mineral Statistics of the United Kingdom for the year 1896." London: 1897.

shire, 89,629 at 21,176*l.*; and Lanarkshire, 116,505 at 21,753*l.*, produced a large quantity of the stone raised. The totals for the United Kingdom are 2,286,999 tons, valued at 425,587*l.*

Gravel and Sand.—Here we have two totally distinct substances, from the point of view of their uses, classified under one heading, and the figures hopelessly muddled. The counties producing the most are Bedford, Cheshire, Derby, Essex, Hertford, Kent, Lancashire, Norfolk, Nottingham, Stafford, Surrey, Sussex, Warwick, Worcester, York, and Lanark. The totals for the year are 1,268,310 tons, valued at 90,020*l.*

Slate and Slate Slabs.—The disturbances in North Wales towards the end of 1896, whereby one of the principal slate quarries in the country was closed, did not prevent the figures for the year from being higher than in any previous year. There has been a steady rise in the value of slate raised since 1891, when the returns were 415,029 tons, valued at 987,000*l.*, until 1896, when 586,933 tons valued at 1,338,256*l.* were recorded.

Chert and Flint.—Chert is principally obtained from Derbyshire and Flintshire, which counties supply the Potteries with the stones for grinding up the materials from which china is made. Most of the flint is from chalk quarries. The totals for the year are 107,967 tons, valued at 17,030*l.* It is interesting to note that the mining of flint for the manufacture of gun-flints, which are "exported to savage countries," is still carried on at Brandon, in Suffolk, and during the year no fewer than 4,399,000 gun-flints were turned out. The quantity of flint raised on this account, however, was only 278 tons, valued at 36*l.*

Quartz.—One return only from Argyllshire, where 519 tons valued at 389*l.* were obtained.

Slag.—A recent legal decision has shown that excavations in old slag heaps are not quarries in the meaning of the Quarries Act, so that, in future, "slag" will disappear from the returns. At the same time we may note that, during 1896, no fewer than 562,293 tons, valued at 15,358*l.*, were obtained. It is gratifying to note the active working of these unsightly heaps which, in consequence, are gradually disappearing in certain districts, to the general improvement of the country round. The principal use of the material is as road metal.

Gypsum.—This mineral is raised principally for making plaster of Paris and Keene's cement; fine monoliths, as alabaster, are also obtained for decorative purposes. Nottinghamshire and Staffordshire are the two principal counties from whence gypsum comes. The totals for the United Kingdom for 1896 are given as 193,311 tons, valued at 74,538*l.*, a slight increase on the production of the previous year.

Ochre, Umber, &c.—The compilers observe that some of the ochre of Anglesey is obtained from a native earth dug up from shallow pits, and a considerable amount is deposited by the ferruginous water from the copper precipitation pits, when exposed to the action of the atmosphere in shallow ponds. Ochre and umber are obtained principally from the counties of Devon, Gloucester, Somerset, and Anglesey. The output for the year was 9,891 tons, valued at 24,688*l.*; used very extensively in the preparation of paints.

Clays.—Totals for 1896, 11,341,782 tons, valued at 1,442,069*l.*

We need not discuss in detail the returns relating to metals or coal, no new features are presented. It may be remarked, however, that coal, arsenic, copper, tin, and uranium all show a falling off in value as compared with 1895; whilst iron ore and lead ore show considerable improvement in that respect.

The total value of all minerals scheduled for the year 1896 is 69,088,366*l.*, as against 69,133,164*l.* for the previous year.

The figures just given by no means represent the value of the *whole* of the minerals raised in this country, and those who make comparisons with the annual mineral output of the United Kingdom and that of other countries should bear this in mind. The returns are certainly not inflated, and the figures as a whole are as accurate as the Acts of Parliament at present in force allow them to be. But these Acts do not go far enough to enable us to obtain full figures in reference to certain minerals. In all cases where a quarry is less than 20 ft. in depth, the owner thereof is not compelled to furnish a return to the inspector, as his working does not come under the Quarries Act. This operates very disastrously in the case of shallow clay workings, and it is safe to conclude that the figures relating to clay are very much lower than they would be were every clay-owner compelled to make a return, no matter whether the face of his working were less than 20 feet in depth, or more.

The same observation applies to stone quarries, and gravel and sand pits. Taking these things into account, it is possible that the total annual value of raw minerals (within the definition adopted by this Blue-book) raised in the United Kingdom would amount to at least 73,000,000*l.*

Glancing at the statistics as a whole, they are remarkable for the absence of uniformity in the method of presentation; the subjects should be balanced more evenly. An illustration will serve to make our meaning clearer. Under the heading of "Coal" we find not only a summary of the production of coal by counties (particulars of individual returns are not allowed to be given), and a table giving the output of coal in the United Kingdom since 1873, but the table also includes the quantity shipped for foreign countries in the form of coal, coke, and patent fuel, &c. Then there are tables giving the prices of coal per ton at the pit's mouth, in the London market, and at the principal shipping ports in the kingdom. After this information there is a schedule of coal and coke conveyed by railway, canal, and other inland navigation companies, and by sea. Particulars of exports follow, the whole being set out in much detail.

Contrast this excellent return relating to coal with that referring to granite, limestone ("the most important mineral which is quarried in this country"—as the compilers truly remark), sandstone, and the like, and we find that the last-mentioned minerals are treated with but scant courtesy, summaries of production by counties only being given. It is much to be regretted that no particulars are given in reference to exports and imports, for they would certainly open the eyes of stone merchants and the public, and show how slowly but surely the foreign granite merchant has taken foothold in our principal markets; whilst at the same time

we should be able to get some idea of our granite trade abroad. To this criticism it may be answered that we can consult other returns such as those published piecemeal by the Foreign Office in the shape of Consular reports, by our own Board of Customs, the Board of Trade, or by consulting the statistics of foreign countries, in order to learn the state of our own trade. And that is precisely what we have to do, but the process is a very unsatisfactory one. The Consular Reports are not all drawn up on one plan, and particulars such as we require are often wanting; and we have yet to learn that it is desirable to consult figures published abroad. Such particulars as we ask for are published in reference to coal (as we have remarked), also to iron, copper, zinc, and a few other minerals, in the Blue-book under review. The raw stone raised is more important as regards value than the metals alluded to. Why not give them at least the same consideration? If it is contended that most of the stone exported is manufactured first, and that particulars concerning it ought not to find a place in these returns, then we must ask for the rigid exclusion of all "manufactured minerals" from this Blue-book. If patent fuel receives attention, so ought artificial stone, which is daily becoming more important. At present we have no means of ascertaining in what way the manufacture of artificial stone is affecting the quarrying of natural stone; it would be interesting to have some information on that head also.

Then, the method of classification of minerals adopted in this work is susceptible of much improvement. At present the general arrangement is alphabetical, the particulars referring to closely-related substances being placed in different parts of the book. Thus, limestone is sandwiched between lead ore and manganese ore, and fluor spar is found between copper precipitate and gold ore. We would suggest the following classification as being more natural:—First, to divide the minerals raised into two broad groups—(a) metals and (b) non-metals. The first group (a) may be divided into "iron ore," "lead ore," "copper ore," &c. In cases where it can be conveniently done, these should be sub-divided. Thus, iron ores may be dealt with as (1) limonite, (2) hæmatite, and so on. This last sub-division is attempted in part by the present arrangement, but the fact that it is not adopted throughout in regard to iron renders the results of but little value.

In reference to the non-metals (b) the general arrangement might run somewhat as follows: Such substances as jet, salt, coal, and fluor spar might well be dealt with under separate headings. But for the most part we should prefer a geological classification into aqueous, igneous, and metamorphic, for the bulk of the remainder. Under this arrangement sandstones and limestones would be found near each other; the igneous could be divided into holocrystalline and volcanic rocks; and slates, quartzites, and the like would be dealt with in the metamorphic division. In a general way this would bring all "stone" together, which would be much more convenient than by the present method of arrangement. But we would ask for more than this. Under the heading "Limestone," we should like to see sub-divisions showing how much of that mineral was utilised for making lime, or cement, and the

proportions used for building stone and for agricultural, chemical, and metallurgical purposes. That is not dealing with "manufactured minerals," but with raw materials only. The same for the holocrystalline igneous rocks—granite, syenite, and diorite; only that in this case we should like to know how much was employed respectively for road metal, kerbing, and general surveyors' purposes, and for building stone. In calculating the value, we should not, of course, deal with the cost of any manufactured article, which would enormously inflate the returns, and not give a true account of our mineral output and its value. If we did include a manufactured article—artificial stone, for instance—particulars would be given as an item of information only; we should not admit the figures relating to it in the general totals, unless the mineral matter of which the stone was made was not recognised in dealing with that class of mineral matter in its raw or unmanufactured state.

Now, in proposing this classification we are not by any means extravagant. The method we foreshadow is different to that adopted by any foreign country, but is by no means as detailed as that of the United States, where specialists are employed to deal with each group, the whole being placed under a general editor. What we principally object to in the United States method of handling the statistics of their "Mineral Resources" is the general tendency to include manufactured minerals in the general totals giving value. But we like the occasional articles showing the mode of "getting" the raw minerals and special modes of dealing with these latter; also the causes for the rise or decay of the mineral industry in any particular district, and the suggestions for improvement where desirable. This might be copied to advantage by the compilers of our own Mineral Statistics, and we are not sure but that such was not contemplated in the recommendations of the Royal Commission upon Mining Royalties which were indorsed by the Departmental Committee upon Mining and Mineral Statistics, though these recommendations demanded a separate general report upon the mining industry of the country. Such reports have since appeared,* and the circumstance that they were prepared by such an authority as Dr. C. Le Neve Foster is a sufficient guarantee of their excellence.

It is impossible to do much in the direction indicated without adequate staff and money to carry out the work, and we suspect that the real reason our Mineral Statistics are dealt with in the perfunctory manner they are in many ways, is the lack of "sinews of war." Indeed, that would seem almost certain from the following sentence in the Introduction of the book under review, namely:—"The number of separate quarries is so great that the individual returns could not be published without enormously increasing the size of the book. For this reason it has been thought desirable to publish only the totals for counties." If our surmise is accurate we can only say it is high time that sufficient money was devoted to the purpose. We ought at least to know as much about our mineral output and resources as do those foreign Powers who

are sparing no pains to develop and disseminate knowledge concerning theirs. We have reason to believe, from the results, that the learned compilers of our Mineral Statistics are severely handicapped, and that many of the anomalies we have pointed out would not exist had matters been otherwise. The Treasury must be reminded that our mineral wealth is the "backbone of the country," and particulars concerning it must not be dealt out in a niggardly fashion.

NOTES.

The Engineers' Strike. It is obvious that we are now watching the end of the engineers' strike. The withdrawal of the London demand for a forty-eight hours' week is the signal of the men's submission. It is difficult to write on the actual conditions of the struggle, since it is changing from day to day, but it is clear that the bad time for the strikers has now arrived. There is all the appearance of a break-up in their ranks. The Clyde men are said to contemplate a separate organisation; this may not be true, but the rumour indicates dissatisfaction. Places have been frequently filled up by non-unionists, and many unionists are now beginning to realise that even when the strike ends they may be unable to find work. It is probable also that, so many contracts having been placed abroad during the strike, the volume of business will be for some time less than before the strike. We are, in fact, near the melancholy spectacle of an industrial débacle.

New Academicians.

ARCHITECTS will be glad to hear that Professor Aitchison, A.R.A., the President of the Institute of Architects, has been elected R.A., an honour well merited, in recognition of his exceptional knowledge of and taste in architecture, and the important influence which his lectures on architecture at the Royal Academy have exercised on the minds of students of architecture old and young. Mr. E. J. Gregory, A.R.A., has also been elected R.A. His learning and power in the technique of painting fully justify the choice, even if we find his works somewhat devoid of inspiration. Technical power in painting is what an Academy of Art can teach and can form an accurate judgment of, and therefore it should be an essential point in the election of Academicians, and that is the real answer to the charge sometimes made against the Royal Academy of having improperly neglected and kept outside of its doors some painters of great power as colourists or as imaginative inventors in art, who nevertheless were bad draughtsmen: Rossetti is one instance. The new Associates are Mr. H. H. La Thangue, whose election will be generally approved, and Mr. Lionel P. Smythe. The latter choice seems rather like a concession to the side of impressionist painting, and there may be some difference of opinion in regard to it.

Treasury of Cnidus at Delphi.

At a recent meeting of the Ecole Française at Athens, M. Homolle expounded his view that the Treasury at Delphi, which, since its discovery, has gone by the name of the Treasury of the Siphnians, was in reality dedicated by the Cnidians. The building, it will be remembered, was described in some detail in our issue for June 8, 1895. The

change of name has resulted from the further progress of excavations, and is, of course, of considerable importance for the history of art. The main reasons for the change are as follows:—1. The three honorific decrees inscribed on the anta belonging to the treasury all relate to the Cnidians. 2. The dedication is in an archaic alphabet characterised by two letters known only in the system in use at Melos and Cnidus, *i.e.*, C half circle for *o* and *o* for *u*. There is a further argument *a silentio*. Among the numerous inscriptions with which the interior of the walls were covered none occurs later in date than the second century B.C. Mr. Barclay Head, in his catalogue of the coins of Cnidus in the British Museum, has remarked on the paucity of coins issued after B.C. 167, and quite independently he concluded that the city about that date sank into insignificance. The new plans of the whole precinct of Delphi will shortly be published, and we propose then to give a detailed account of the results of the last two years' excavations.

Mr. Watts' Statue of "Energy."

It is gratifying to learn that Mr. Watts intends to present to the nation his colossal equestrian statue of "Energy" and that it is to be cast in bronze at the expense of the Treasury; but the statement that "an admirable site has been found for it in Hyde Park in the centre of the terrace at the foot of the Serpentine," is more questionable. In whose judgment is this "an admirable site?" Not in ours, certainly; the space is far too narrow; a colossal work like that requires a considerable space in front of it to be estimated properly; if it is crammed up in that comparatively narrow terrace no one will get a proper view of it, except a too distant one. The site is quite a mistake, and ought to be re-considered. We should very much doubt if Mr. Watts himself would feel satisfied with it.

The Spoiling of Stratford-place.

If the scaffolding up before one of the houses on the east side of Stratford-place means, as we understand it does, that this house is to be raised, breaking through the range of cornice and balustrade at this point and spoiling the continuity of the design, we can only say that those who are doing this are selfishly spoiling a remarkable piece of London street architecture for their own advantage, and it is much to be regretted that there should be no authority with power to stop such a stupid piece of work. Stratford-place is unique in London; it is the one example of what may be called monumental street architecture we have, designed by an architect whose name has gained a permanent place in the history of English architecture; and that a single owner or tenant should be allowed to destroy the effect (and in this sense the alteration of a single house is as bad as the alteration of half a dozen) is a thing that there ought to be some means of preventing.

Proposed Railway Bridge at Paris.

THE "Ouest" Railway Company are proposing to build a bridge over the Seine, with iron girders more than eight metres in height, to carry their new line from Courcelles to the Champ de Mars. It is considered, and no doubt rightly, that this

* First Annual General Report, Mineral Industry of the United Kingdom for 1894; Second ditto for 1895; Third ditto for 1896 (Blue-books).

would very much injure the view along the river, and the official representatives of the city are entering a protest against it to the Minister of Public Works, who has promised not to approve any design which will not satisfy all the interests concerned. This will be rather difficult; but it is noticeable that in Paris such a point is considered of importance by the Government, and it is expected that they may even refuse their consent to the bridge. In London it would be considered a matter of no consequence.

THE recent fire in the Cripple-
The Site of
the Cripple-gate
Fire.
 gate district has given the City an opportunity for promoting some street improvements, and pressure has been brought bear on the Corporation, as well as on the London County Council, to take up the matter. The reasons for the improvements are not difficult to find, as they primarily comprise the necessity of reducing the risk of a fire spreading over narrow thoroughfares, and the further necessity of affording better traffic facilities in a very congested area. The initiative seems to have come from a Special Committee of the Cripple-gate Ward, whose operations commenced on December 21, and who on Wednesday last reported their recommendations to a general meeting of the ratepayers, convened with the special purpose of strengthening the Committee's hands. At this meeting it was evident that the Committee had already considered a number of plans on broad lines, but had determined for the present only to press for some improvements on the area actually affected by the fire. Jewin-street, they consider, should be widened to 60 ft. and Wells-street and Hamsell-street combined as one broad thoroughfare of similar width, and continued to Red Cross-street. These improvements are proposed with due regard to further schemes for joining up Wood-street, and prolonging Jewin-street to the Cattle Market. With the exception of a few details, the ratepayers were unanimous in adopting the Committee's proposal, which were very ably explained by the Chairman, Sir Henry Knight. Improvements as suggested at present are, of course, merely a question of finance and promptness. Those in authority will have to show more than usual activity if they are to come to a decision before building operations are commenced on the Cripple-gate area on lines identical with those previous to the fire. As to finance, negotiations should be greatly simplified by the fact that only one ground landlord has to be dealt with, *i.e.*, the Goldsmiths' Company, who are treating the matter in a very liberal spirit.

THE "National Fire Brigade
Provincial Fire
Brigades' Bill.
 Union" proposes introducing a Bill next session dealing with fire brigades generally throughout the country, excepting those already constituted by Act of Parliament. The Bill deserves the support of those interested in fire protection, for, without advocating any measures which might collide with such interests as those of the insurance companies, certain practical requirements are defined which must tend to increase the efficiency of the fire service. At the present moment there are still many fire brigades which, in organisation, equipment, and discipline are practically useless. If the Union

Bill becomes law, a Local Government Board's certificate as to efficiency will be essential for any force which is to have the recognition of the authorities. Further, we find that there will then be more pressure upon the Local Councils to have well-equipped brigades at their disposal. At present many of our authorities are very dilatory in this matter. There is another point he would here touch on when speaking of provincial firemen—that of uniform. The Fire Brigades Committee of the London County Council wish to stop the wearing of uniforms in London which are in any way similar to that of the Metropolitan Fire Brigade. Considering that this uniform is the recognised equipment of nearly the whole of the firemen in Great Britain, the Union was naturally indignant, and we are glad to see that they are taking steps to stop the action of the Committee.

Bicycle
Storage.
 WE have, from time to time, heard that bicycle accommodation for storage has become essential in many buildings, but, as a rule, architects have been satisfied in providing some sheds or an outhouse for the machines. It is hence a sign of the times to find that the opening article in the new year's number of the *Deutsche Bauzeitung* deals with bicycle stores, with special regard to factories and places of public entertainment. The illustrations to this article show a model cycle-store for two hundred machines, stacked on two floors, *i.e.*, a semi-basement and an entresol. The method of compact storage is in form of racks which are open to gangways on both sides, and into which the machines are slid in such a manner back to back, that four only take the space usually occupied by two. They are brought down to the basement, and up to the entresol by staircases with sliding grooves on either side. We observed last year that the Earl's Court Exhibition provided bicycle accommodation, and we are sure it will soon be found a necessity in many other large places of amusement. The leading factories of the Continent, we believe, have had them for some considerable time, and some of the large offices have adapted their basements for the purpose. The model cycle-store illustrated by our German contemporary is the result of a competition under the auspices of the Berlin Architekten-Verein, which, as we have noticed before, always keeps well abreast of the times in such matters. The author of this model design is Mr. Carl Bernard, who was awarded the first premium.

The Constitution
of Hydraulic
Cements.
 MESSRS. NEWBERRY have been carrying out an extended series of experiments with a view to ascertaining whether it is possible to find a general formula which will indicate the amount of lime which should be added to any clay to give the best result in the manufacture of hydraulic cement, and also what effect the oxide of iron in the clay has upon the cement. Experiments were also made to ascertain the effects of soda in the raw materials, as the artificial addition of alkalis is often recommended in the case of materials naturally deficient in them. The possibility of the replacement of a certain proportion of lime by the magnesia in the clay was also made the subject of experiment. The results of their experiments are given in a

paper communicated by them to the New York section of the Society of Chemical Industry, and readers interested in the scientific aspects of hydraulic cement manufacture will do well to refer to their paper. The conclusions arrived at by Messrs. Newberry are summarised as follows:—1. The essential constituents of Portland cement are tri-calcium silicate, with varying proportions of di-calcium aluminate, and the theoretical weight of lime to be added to a clay to make Portland cement is found by multiplying the silica by 2.8 and adding to this figure the amount of alumina multiplied by 1.1, thus:—Lime required = $(\text{Si O}_2 \times 2.8) + (\text{Al}_2\text{O}_3 \times 1.1)$. 2. The iron oxide in the clay need not be considered in calculating the proportion of lime required. That, although at a high heat the iron oxide combines with lime, and acts like alumina in promoting the combination of silica and lime, it may in practical manufacture be disregarded. 3. Soda is of no value in promoting the combination of lime and silica, and probably plays no part in the formation of cement. 4. Magnesia also probably plays no part in the formation of cement, and is incapable of replacing lime in cement. No attempt was made to investigate the injurious effects of considerable percentages of magnesia, because that matter is being exhaustively dealt with in Germany.

The Banqueting
House, Ken-
sington Gardens.
 ON January 12, 1895, we published Mr. G. Weald's set of measured drawings of this structure, which stands along the north side of the private gardens attached to Kensington Palace. In accordance with the scheme initiated by the Queen for giving the public admission to the Palace state-rooms* an estimate, to be submitted to Parliament by the Office of Works, will provide for a "restoration" of the Banqueting House, which, it is believed, was designed by Wren. To what we said three years ago upon the style and character of the building in question, we may add that of late years it has been shamefully misused, having been made to serve as a store-house for plants, gardeners' tools, barrows, and lumber. In his letter printed in the *Times* of December 11, 1895, the present President of the Royal Academy directed attention to its sorry condition. Moreover, six windows, of different sizes, have been inserted in the north wall, their varying heights being cut to suit the levels of some sheds built against the wall, whilst within, much of the panelling and carved mouldings of the north wall was cut away for shelves and pot-bins, and the original ceiling of the central compartment has, it appears, been removed. There can be little doubt that in the original design it was intended that the apartment should be lighted by only the south range of windows, with those of the two end ante-rooms. It is built of red and brown brick.

Sir John Gilbert's
Works.
 THE Society of Painters in Water Colours have got together a fine collection of the works of the late Sir John Gilbert, sufficient to fill the room. There is even less variety in these than we expected to find; Gilbert found his characteristic style and type in art, the thing that he could best do, early in his artistic life, and (in his works

* See our "Note," pp. 52-3, ante.

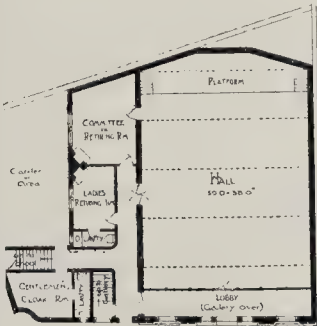
in water-colour at least) hardly ever departed from it. In his first exhibited drawing, "The Arrest of Hastings," painted in 1835, he had not acquired his broad full style of handling, and the expressions of the faces are somewhat exaggerated, though the action of the whole group is very energetic and dramatic. In his matured works he got rid of all over-emphasis in the expression of his figures (unless it may be in his "Malvolio," a subject rather out of his usual line); they were subordinated to the general effect of the scene, in which, in the open-air pictures (which form the majority), the landscape and figures always seem completely to belong to each other; of this harmony in the whole picture "The March of the Army" (3) is one of the best examples. It must be admitted that the figures in this and other works of the same type have little personal or human interest; they are "figures," in a pictorial sense, and nothing more; but the total effect is nearly always striking and full of vigour and movement; and if there is a good deal of repetition of effect and *motif*, at all events the painter had achieved a well-marked style of his own. His frequently fine and broad treatment of landscape has perhaps not been sufficiently recognised; but such works as "Gypsies Crossing a Heath" (8) and "Asking the Way" (55) may stand simply on their merits as landscapes, apart from the figures. The collection includes a good many charming sketches, mostly monochrome, of bits of architecture, which Gilbert seems to have studied a good deal, though he seldom made any use of it in his finished pictures. The fact that the collection was confined to water-colours explains of course the absence of one or two of Gilbert's very best works, especially the "Arrival of Wolsey at Leicester," a picture superior in human interest and pathos to the type of work by which he was best known, and which made one regret that he did not oftener step aside from "the buff-jerkin business."

Society of
Miniature
Painters.

THE third annual exhibition of the Society of Miniature Painters, at the "Modern Gallery" in Bond-street, is as successful and as well filled as the previous ones, and shows that we have a considerable number of artists among us now who can practise successfully this pretty and attractive form of portrait painting; for it is to portraiture that the art is chiefly directed, and in which its chief value lies. In regard to the more realistic (and sometimes hard) type of miniature portraits, the main object, of course, is to supply a faithful likeness of a person on a small scale and in a kind of ornamental manner; one artist, Miss Rogers, in fact, has produced a portrait of a child which would go into a setting in a finger ring, if desired, the face being hardly more than one-eighth of an inch in width; but this is rather a curious experiment than an illustration of miniature painting at its best. It is possible, however, to impart to a miniature head a very idealised effect, by softening down adjuncts and avoiding hardness and over precision; as in Miss Lewis's "Vera" (168), and Mr. Alyn Williams's "A Portrait" (251), and Mr. Sauber's "Une Belle" (90), a very good bit of colour, and very graceful in line. Among the more realistic order of portraits Mr. Rinzi's portrait of himself (49), Mrs. Debill-



Proposed Hall for School of Art, Berkeley-square, Bristol. Mr. H. Dare Bryan, Architect.



Proposed Hall for School of Art. Plan.

mont-Chardon's "Miss M.C." (38), Miss Bethell-Gibson's portrait of the Queen (96), Miss Hope Thomson's "Miss Plowden" (108), Miss Lee Hankey's "Ivor" (88), and Mr. Cecil Hobson's "Portrait of a Child" (104), are among the best we noticed. The Society, it may be added, has made arrangements for keeping a permanent collection of miniatures open at its Gallery, each member having the right to have three representative miniatures on view throughout the year.

THERE has recently been discovered in the Île de la Cité, near the Morgue, the remains of a portion of a Roman wall, of which the footings and the first three courses of the wall are intact. The footings are formed of very large rough-hewn blocks of stone; and

the wall itself, a little more than two metres in thickness, is built in coursed masonry of large stones without mortar. It is locally considered that this is undoubted Roman work, and a part of the wall of the ancient Lutetia. The stones will be preserved either in the Carnavalet Museum or in the Salle des Thermes at the Cluny Museum. Apparently it is not possible to leave them *in situ*.

PROPOSED HALL, SCHOOL OF ART, BRISTOL.

THIS building is shortly to be erected at the rear of the School of Art, in Berkeley-square, Bristol. The design is of Georgian character in keeping with its surroundings, and the materials to be used are red brick and Bath stone. The architect is Mr. H. Dare Bryan, of Bristol.

STUDENTS' DRAWINGS AT THE INSTITUTE.

AS the years pass and January comes round, those who have nominally passed their student days may well look with considerable interest to these annual exhibitions of students' work to reveal to them something of the fresh ideas which are for ever following on one another's heels with every fresh generation of architectural students. And they may legitimately expect to see some designs that will help them to form or strengthen their opinion of the value of those fresh ideas. This year it does not seem to us that the students' work answers this expectation in any marked way. The average of ability in the designs is lower than usual, and drawing does not appear to have made any distinct move in any direction. The best competitions are those for the Tite prize and Grissell Medal, but in the former few competitors seem to have been able to give equal attention to the villa and the garden, or to treat them together as part of one design; and in the latter most of the competitors have

neglected either the constructive or the æsthetic side of the problem.

The subject set in the Soane Medallion competition this year—a concert hall—though a good one in some respects, has technical difficulties connected with it that appear to have frightened competitors, for there were but five, and one of those can hardly be taken seriously. There is a suggestion of humour about one of the conditions, which requires the regulations of the London County Council to be observed as far as possible. Are the regulations such that they cannot be entirely complied with, or are the other conditions of the competition incompatible with the regulations? Unquestionably the best architectural design is that by "Pan," and, taken as a whole, it is also, probably, the one that would most commend itself to a practical manager for accommodation, convenience, and safety. Whether the internal ratio of length to width is quite the best is a little doubtful, but it makes the most of the site given, and the entrances and exits are well planned and sufficient. The elevations and perspective are strongly reminiscent in character and drawing of the design that was successful in this competition last year, and, without being equal to that charming little market-hall, it has the merit of distinction and of looking like what it is intended for. The design under the quaint device, "34 South," also has merit; the proportions and seating of the hall are better arranged than in the last named, and the entrances are on the balcony level which, other things being equal, makes shorter exits from the upper levels. This advantage seems thrown away in this case by cramped and complicated planning; the elevations are much below the average, and hardly less fussy than the drawings by which they are presented. "Quod erat faciendum" has planned a nearly square hall occupying the whole width of the site, with a "royal box" projecting into the middle of one side in a very unhappy way. Outside the building looks like a temple with a small, unfortunately designed turret crowning the main pediment. "Lyra" has planned a circular room that more experienced hands might perhaps have made something of, in an architectural sense; but the circular form is one of the worst for a concert-room, unless it be intended solely for instrumental music, with the band placed in the centre.

The fascinating subject of "A Villa and Ornamental Garden" has brought out the unusual number of nine competitors for the Tite prize, who have produced several excellent designs, between which the prizes committee must have found it very difficult to choose. Mr. J. Stevens Lee, who gains the prize, has adopted, in both the house and garden, a treatment simple as compared with most of the others, and his drawings are weak and by no means striking at first sight. The house is a plain rectangle, built round a top-lighted hall of one story high only, and with a wing, also of one story, containing a conservatory, billiard room, and some rather cramped offices. It is conveniently planned, but the bath room over the drawing room is a blemish. The elevation shows only equally spaced rectangular windows, a low roof with broad overhanging eaves, and a long projecting portico of the Roman Doric order. The principal feature in the garden is a large circular pool of water surrounded by steep grass slopes and flights of steps leading down from higher levels, where there are a flower garden and a tennis lawn. A medal of merit is awarded to Mr. Thomas A. Pole for a rather more ambitious effort, which has produced a straggling but otherwise very well planned and pleasing house, and a fairly good but too broken-up garden. His chief success has been in raising the building considerably above the garden. By far the best garden is that submitted under the device of a triangle in a circle; the house, too, is pleasing, and not ill planned, and the perspective drawing is a very powerful one. It is not quite easy to see why this design has been altogether passed over, unless it was considered that the garden was an English rather than an Italian one, or some minor faults in the plan of the house became exaggerated in the minds of the committee. "Lorenzo" submits a very cleverly planned and pleasing house, and summarises his ideas in a good water-colour drawing, but he has rather thrown away his chances as regards the garden to get a short and inadequate avenue on the entrance side.

The grounds upon which the Grissell Medal

has been awarded to the design under the motto "Slavekirke" are difficult to understand. There is perhaps no fault to be found with it except that it is commonplace in idea and construction, and very inadequately drawn. But there are at least two designs superior to it in these respects, and one, that marked "Emce," not inferior in the fullness with which the construction is shown; it is true that rough-cast instead of weather boarding is used in this design, but one can hardly suppose the award to have been influenced by that, especially as a medal of merit is given to a frankly "half timber" design. There are no less than twelve competitors for the prize, but a large proportion of them do not seem to have been very serious in their efforts. "Emce" and "Thistle" have, however, produced work of exceptional merit, and "By Lamplight," "Slavekirke" and "Doan Tu Nomi" fair ones. "By Lamplight," Mr. W. Stanley Bates, gains a medal of merit.

There is a great falling off this year in the drawings submitted for the Owen Jones studentship, which has not been awarded. It was stipulated that the Arab Hall in Lord Leighton's house should form one of the subjects for study, and one competitor has confined himself to this one subject. He shows considerable feeling for colour, but his drawing is very poor. The only other competitor has submitted a great many neatly drawn and coloured but listless studies.

The Silver Medal for measured drawings is generally well competed for, though the work must be laborious, and not very interesting. This year there are six competitors, and the medal has been awarded to Mr. Thomas Tyrwhitt for a very complete series of drawings of that most charming of Cambridge Colleges—Clare. Mr. Tyrwhitt presents his subject in clean and workmanlike drawings executed with a clear ink line, and with none of the once fashionable tricks of execution. A medal of merit is awarded to Mr. Cyril Wontner Smith for some likewise very neat and practical drawings of Thaxted Church, Essex. Other competitors have found subjects in the Cloisters of Norwich Cathedral, which make rather monotonous elevations; the well-known Church at Cliffe—which is not well drawn; the Old Charterhouse and Queen's College, Cambridge, both of which we may hope to see again in future years, for they are worthy of being studied. Prior Crauden's Chapel, Ely, which is added to the drawings of Queen's, has been more worthily presented on other occasions.

Of four competitors for the Pugin Studentship, Mr. De Gruchy has worthily won his success, though had Mr. Fulton done more and more varied work, he might have had a harder fight for his spurs. His work is perhaps almost over-clean and careful, his perspective almost too flawless; one feels it is magnificent, but a little inhuman, and not so sympathetic as if the author had been able occasionally to let his subject run away with him. A medal of merit is given to Mr. Benjamin Bower for some beautiful and telling pencil drawings; and Mr. Fulton gets the Aldwinckle Studentship for some admirable ones of the well-known stalls at King's College, Aberdeen.

In the Institute Council Chamber are exhibited the drawings and sketches made by last year's travelling students, and one set made by the Pugin Student of 1896, Mr. C. C. Brewer, which, if less numerous and less cleverly got up than some of the others, are certainly the most artistically interesting. It is doubtful, perhaps, if the absence of title in two or three instances adds to the interest; one likes to know what sketches represent; but it cannot prevent their being in every sense strong work. Mr. Inglis's drawings are excellent, but their scale is too small as a rule to allow of justice being done to the fine and mostly well-known subjects he has chosen. Mr. Haywood has wisely spent much time on measured drawings; his work, too, is irreproachable, but we could wish he had not wasted an effort upon the drawing-room chimney-piece of South Wraxall Manor. Mr. Henderson, the Owen Jones student, seems to have spent his time in Stamboul, drawing tiles and faience. It is a pity we do not know the secret of burning the fine red he found in almost all cases. The Aldwinckle student has, as usual, been to Spain, but his sketches, though numerous, do not satisfy one that the award to him of the studentship was altogether judicious.

The old Council Chamber is taken up by an exhibition of the "testimonies of study" sub-

mitted by candidates in the Institute examinations—drawings that are meritorious, in some cases exceedingly so, but not of sufficient general interest to call for remark.

THE ARCHITECTURAL ASSOCIATION: COMPOSITION IN PUBLIC BUILDINGS.

AN ordinary fortnightly meeting of this Association was held in the meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, on Friday last week, the President, Mr. Hampden W. Pratt, occupying the chair.

The minutes of the last meeting having been read and confirmed, Mr. T. G. Chambers was elected a member of the Association.

The Chairman announced that on the 28th inst. the Elementary Water Colour Class would commence; and on the 31st Mr. Max Clarke's lectures on "Ventilation, Lighting, and Heating" (Division II.) would begin. The Quantity Surveying Class had been postponed for the present, but it would be started again if sufficient members joined.

Mr. F. T. Baggeley then read the following paper, entitled "Composition in Public Buildings":—

"This subject, which six months ago I rashly undertook to write upon, is a vast one, embracing really no less than the whole field of architectural design; and, although I shall confine myself to its æsthetic side, it will not be possible to do more than deal very superficially with a few points even of that. It is, too, as elusive and slippery as an eel; no sooner does one begin to feel a more or less firm grip upon some part of its complicated anatomy than doubts arise, and the chase has to be begun again. It perpetually leads to the quicksands and dry deserts of philosophic inquiry into the function of art and foundations of beauty, where one meets the mirage of a logical reason for doing what one wants to do; and it leaves one at last floundering in the ocean of uncertainty that surrounds the firm ground of knowledge.

The hydra heads of this provoking subject are the principles that should govern the composing of the various parts of a building into a pleasing and harmonious whole. And though it might be taking things more in order to try to seize its tail first, and discuss the building up of a moulding or a single curve, the incidents of the chase may possibly be a little less wearisome if I attempt to grasp the heads.

The composition of the completed building is really the true function of the architect. In a properly organised system the details and ornamentation would be left to the various trained craftsmen who could, and would be trusted to, work in harmony with their chief and with each other. But ours is a disorganised system, under which no harmony can be attained unless the architect himself composes or, as we say, designs the details also, or has them efficiently copied from others which he can choose. The latter alternative has come to be universally condemned; and properly so. But the condemnation has been so noisy, and the attention it has attracted has been so great, that detail still continues to hold the absurdly prominent position it attained when all architecture was judged by the correctness with which the details were copied. In connexion with any other matter, the admission that anything is a detail is sufficient to relegate it to at least the second place in our consideration; but in connexion with architecture it is often the only thing that is even noticed by the critic. Our only historian, because from the Renaissance up to his time architects generally borrowed a number of ornamental features and most of their detail from ancient buildings, proceeds to heap contempt upon all modern architecture as mere copyism, and goes so far as to tell us that true architecture "expired" at the Renaissance. Most critics, in fact, have for centuries awarded praise or blame to architectural works on the merits or demerits of their ornamental details alone, at one time praising "correctness" and more recently, originality. Few and scarce have been the writers who gave a thought to such things as light and shade, grouping, proportion, scale, character, and expression—except so far as the ornamental features were affected—who were able to lay aside the microscope and the dissecting knife and study the lines and pose of the model.

The fact is, those critics of architecture who have succeeded in being heard have too often been men of literary and general, instead of

architectural, culture, men to whom the ornamental part was the more obvious, and more easily understood. On the ornamental details their attention has been naturally fixed, and to such an extent that, for a time, they persuaded even architects that architecture was a matter of columns and cornices, or of window tracery and mouldings, or of something vague to be invented to take the place of these things. Mr. Fergusson himself was in no sense an architect, though a picture gallery is said to have been erected from his design, and he looked at architecture from the outside only, and, with all his careful comparison of photographs and book illustrations, never seems to have succeeded in seeing anything but a number of different systems of ornamentation which he could number and ticket and criticise for the astonishment of the public, and the confusion of students. It is said that originally his aesthetic sensibilities were not deficient; but if that is so, he had certainly succeeded before he wrote his history of modern architecture in choking them with philosophy and burying them under a mountain of statistics.

Yet even Mr. Fergusson might have avoided, if he had not been blinded by a complication of preconceived opinion and far-fetched theories, the gigantic mistake upon which he founded his indictment of modern architecture, the mistake of supposing that decorative features first began at the Renaissance to be imitated from older buildings. Had it been true, it would have been no proper foundation for a sweeping condemnation of modern architecture. But it is not true; it is so far from true that in every age there has been far more imitation than original design in architectural ornaments; so much imitation, in fact, that, in most cases, "copying" would be the better word. The Egyptians, when they wanted columns and capitals and cornices for their temples, did not invent them, but copied in limestone and granite the bundles of reeds and the accidental forms of their earlier mud structures, and continued to copy them with but slight modifications to the end. The Doric temples were absurdly exact copies in marble of the more ancient wooden ones, even to the nail heads. The details of the Ionic order were borrowed from Asia Minor, and some say the Corinthian also. The Hellenic Greeks, beyond adding a degree of finish due to their greater mechanical skill, never got very far from their originals. The Romans borrowed Greek details by the bunch, and in most cases without any alteration (except that they struck their curves instead of drawing them by hand), and applied them in their own way to their own uses, precisely as the Renaissance architects afterwards applied Roman details; and the Romanesque was but Roman work badly copied. The variations that were developed in the details of the Pointed styles of Western Europe in the three or four centuries through which they lasted were, it is true, considerable; but even they were developed very gradually, and under exceptional circumstances, that are not likely to prevail more than once in a thousand years or more. It is very doubtful, too, if the successive changes were made consciously; it is just as likely that the men who first made them thought they were working the same forms their fathers wrought before them.

Imitation—or, if you will, "copying"—is inevitable as regards architectural forms; and, moreover, it is the only road to improvement. It is not in the power of the greatest genius that ever lived to invent any great number of entirely original ones that will at the same time be acceptable. Those who have been least unsuccessful in the attempt have only succeeded in being absurd, while of the rest the less said the better. New forms must grow gradually, and will inevitably do so if we do not persist in harking back, or in trying to make fresh starts; and if we are not too vain to imitate where we cannot improve, nor too lazy to improve if we can. We need not copy, like the Chinaman who made a dozen cracked slates to a cracked sample; but we shall never get on at all, if each man tries to invent a brand-new style of his own. On the other hand, neither shall we get on if we condemn a fresh variation, merely because it clashes with our preconceived notions. What we must ask is—is the change an improvement, or is its freshness its only justification?—freshness is always delightful—and if so, is the justification sufficient, or has something more important been lost in the shape of actual beauty or significance? In this

matter a distinction may be drawn between details that are purely ornamental additions to the general composition, with which fancy can safely sport freely, and those which have a functional character, either constructive or as emphasising any line or form in the composition; any change in these seems to demand some greater justification than its novelty. After all, the time and energy expended by architects in trying to freshen up the elements which go to make up their compositions, seems as if it might be rather thrown away when we think that painters and sculptors have to use the same elements that their predecessors have been welding into works of art since the beginning of time. Architecture, of course, is an art on a very different basis to painting and sculpture; but there seems no adequate reason why the architect should not regard his building very much as the sculptor regards his group—as something to be moulded into a thing of beauty as a whole, though the elements may be as hackneyed as a quotation from Shakespeare.

Should any one ask, ironically or otherwise, how this heterodox theory is to be carried into practice, it must be confessed that the best answer is very unlikely to be satisfactory. The only consolation is that if a painter or sculptor were asked a similar question with reference to his art, the reply would be no better. If these things could be done by rule, there would be no art in doing them, and they would cease to interest any one. The world has long ago agreed that most of the skill to do them well must be born in a man, and that very little of it can be put into him by his own efforts, and still less by the precepts of others; and the world is, no doubt, right. The most that can be done is to call attention to certain matters that seem to have led to success in particular instances, and therefore, presumably, may do so again.

But first it may be well to note what is the character of the elements at the architect's disposal, as compared with other artists. While the painter has the whole scale of colours to draw upon, and every line in nature or in art; the sculptor, all natural forms; and the musician, all conceivable sounds; the architect's choice in each direction is limited. Sound he cannot use at all; his colours must be confined to such as time, exposure, and use will not seriously change, and, externally at least, must be mainly those of his building materials; and his forms must be such simple ones as economic conditions impose upon him as a builder. He has, however, the immense compensating advantage that he can use, not only both form and colour as elements in his composition, but also the finished productions of his colleagues, the painter and the sculptor. It is also noteworthy that, although he cannot create interest by making his building tell a story or represent a familiar scene, he has no need to do so, since his creations have a definite purpose, and therefore an innate interest of their own which he can bring out and possibly emphasise.

One of the first things to remember, and, considering the many temptations to forget it, perhaps the most important, however elementary, is that a building is not a flat thing, but an object of three dimensions, having depth as well as breadth and height; and that the best results cannot be obtained unless this is made obvious to the spectator. A comparison of the Church of the Salute at Venice with the Grimani Palace, or of Visconti's buildings of the Louvre with the Palace of Versailles, or of the Horse Guards' building with Inigo Jones's Banqueting House, may indicate my meaning. All these buildings are supposed to be excellent works of art, although they come under Mr. Fergusson's description of "modern" architecture; but while the church in Venice, the Louvre in Paris, and the Horse Guards in London, look like complete buildings, the others, so far as appearances go, might be only ornamental walls. Two, the Salute and the Horse Guards, seem to me unsurpassed as examples of architectural modelling; and it is worth noticing that Kent's success in this was obtained in spite of the always discouraging difficulty of having, not a single large chamber, but a number of small rooms to deal with. Mr. Fergusson, of course, affects to despise the building, being apparently offended by its small scale. One cannot but remark also that the Louvre owes nothing to its details, which are, in fact, distressingly dreadful; but, like the other two, it shows its depth. It does so by means of the projecting arcade, and also, and more especially, by the roofs of the pavilions.

We all know that the French generally show the roofs of their public buildings, where we should probably keep them low and hide them with parapets, and there can be little doubt that it is one of the main secrets of their comparative success with such works; at any rate, the details can often have nothing to do with the matter; in many cases they are of the weakest and most contemptible description.

The exhibition of the depth, or third dimension, by merely exposing the return wall is useless; the two walls still appear to be merely walls, as may be seen by referring to the Banqueting House and Sir Gilbert Scott's government offices. I mean no disrespect to the architects of these buildings, for their present appearance is no fault of the great men who designed them, since they are both unfinished. What is wanted to suggest solidity is something showing over and beyond the walls; in the Salute it is the dome, in the Louvre the pavilion roofs, and in the Horse Guards the charming little turret that Fergusson sneers at. Most medieval churches and public buildings—Continental ones, at any rate—depend mostly on their big roofs for the purpose, which they fulfil in a simple, natural, and adequate manner; and most modern French buildings, and a few English ones, follow their lead. But in England, even in mediæval times, notwithstanding there were the roofs, we liked to have also some solid structure rising from the middle of the composition and advertising the solidity of the edifice by its substantial appearance. And we have continued to prefer the expedient, where we have adopted any at all, to an exhibition of the roof, possibly from an undeveloped feeling that all roofs look unsubstantial. That it is the grander method there can be no doubt, and St. Paul's Cathedral, St. Albans Abbey, and the Brussels Law Courts testify that it is equally efficient. The Horse Guards might also be quoted, since the roofs of the centre block are practically hidden by the parapets. In this instance, however, solidity is partly obtained by another expedient, more common because more easily applicable in many cases, namely, by pavilions rising a story higher than the rest, and so showing their depth, but it is the turret that pulls the whole together and makes one mass of it.

In these days, large public buildings generally take the form of ranges of apartments surrounding one or more courtyards, and, so far as the periphery of actual building is concerned, solidity is sometimes, though not often, given by the higher pavilions just referred to. But it is now rare to find in England any attempt made to bring the whole together into one by a great feature rising behind the external range. Abroad it has been done in the Palais de Justice at Brussels, the new Parliament House in Berlin, and in many other cases. It might easily be done in our own Government offices by building upon the intersection of the internal blocks; and in a number of cases it might be done simply by placing the eternally recurring tower, that we put in the middle of our main front or stick on to a corner, within the courtyard, or at any rate well back from the outside walls. Of course, the tower, as a tower, would lose; at any rate, its aggressiveness would be suppressed; but that is just what is often wanted for the sake of the modelling and unity of the composition. To illustrate this point, I have ventured to cut up an illustration of a very fine competition design published some years ago, to show the effect of taking the tower from the position in which it was placed, and in which there were, no doubt, excellent reasons for placing it, and putting it behind the buildings.

Wherever the tower or other dominating feature of the composition is placed, its proportions, as seen from different points of view, might well receive more careful consideration than they often seem to get. If a tower is used, the main idea seems usually merely to run it up to an enormous height and give it, as nearly as possible, the proportions of a factory chimney. There is frequently the same tendency to excessive height in the drum of a dome, while the flat square domes or roofs used in France and Germany are generally too low. Both the mass and proportions of the main feature, whatever it is, should be regulated by those of the group to which it belongs, a low straggling building wants a high and narrow tower; a more concentrated composition, something broader and lower in proportion. If the area or plan of the feature has to be

small for the edifice, it must be carried up high, or it will appear mean; if the opposite is the case, it can only be subordinated to the whole by keeping it low; if it is made lofty it overwhelms the rest, which must then be itself treated as subordinate; such compositions as the church at the Saluté, before referred to, and the dome over the tomb of Napoleon are examples of the last arrangement, which is obviously the grandest when it can be adopted.

To return to the question of the position of such a feature as a tower, balance requires that it should be somewhere near the centre of the composition. It is inevitably, and is meant to be, the chief object that attracts the eye, and if it is anywhere near the outside, still worse if it is at a corner, the group must be ill-balanced from most points of view. I remember Mr. Armitage, in his Royal Academy lectures on painting, pointing out that the main object of interest should never be near the margin of a picture unless the object were to suggest motion, as in the case of a ship just coming into view, and then the balance of the composition must be sacrificed. In architecture we can never want to suggest motion and cannot have that excuse. It is doubtful if the position should be the exact centre. The best painters and sculptors, though generally careful to put the chief point of interest near the middle of the composition and to preserve a general balance between the opposite sides, always avoid the formality of a strict symmetry. There is something, however, to be said for the view that architects may properly do otherwise, especially in public works; and that such buildings should be symmetrically designed, at any rate with reference to one main axis, the principal feature being upon that axis and not far from the centre of it. For one thing the formality which other artists avoid is really necessary to give that air of dignity and distinction to a great building which its character demands. It indicates organisation and order and balanced construction. If we pass in review a few of those works which, by common consent are the greatest productions of our art, we find that it is easy to note and appreciate the simple majesty of the Parthenon, the spaciousness of the Pantheon, the soaring vastness of St. Sophia, the richness of St. Mark's, the airy splendours of the great Gothic cathedrals and the exquisite lines of St. Paul's; but we cannot find any general arrangement common to all of them, except their symmetry with reference to a main axis, and are forced to the conclusion that, though many varying systems may be productive of the grandest results in skilful hands, yet symmetry is necessary to all of them. On the other hand, it is noticeable that very few buildings of the first order are symmetrical with reference to more than the one axis, and that there is a certain tameness when it goes beyond that; carried to excess, symmetry may easily take all the life and vigour out of a composition.

For the sake of unity and concentration the main tower or other principal feature should be single, and not duplicated or further multiplied.

If it is necessary to have more than one tower, for instance, or even broken-up roofs, still, some one thing should be large enough, and more especially high enough, to dominate the rest; and in such cases it is more than ever necessary to put it well in the middle.

So much was said about the angles and end features of buildings in a paper that I had the honour of reading to the Architectural Association some years ago, that it would be but repetition to dwell much on that part of the subject now. When seen in perspective, the angles of a building are as much the ends of the group as they are in elevation (though not the same angles), and some feature, or at any rate different treatment, is necessary there to mark the definite termination and completion of the composition; without something of the kind a reason for stopping at that particular point seems to be wanting. In any extensive building, rectangular in plan, the sides of which recede from the spectator when seen in perspective, giving long lines running away down towards the horizon, something more than a mere angle-pier or quoins will generally be wanted at the ends of the composition, or a little within them to break such lines and, as it were, lift them up.

It is better, for the general contour of the group if such features are not at, but within, the actual ends. They may even be the middle features of short fronts. The great thing is that they must break the lines; they must rise above the skyline and, their vertical lines

ought to be higher than the cornice or finish of the walls generally, although the cornice may, and indeed should, as a rule, break round them. The necessity for carrying up the vertical lines of these features is often overlooked with unfortunate results, as in the case of the buildings of the Louvre before referred to. Great care should, however, be taken that these secondary features do not compete with the main central one for attention. They should be smaller in every way, but especially they should be lower; and to get the best result they should be entirely different in design. The hen and chickens arrangement of a great dome and several little domes, or a great tower or spire and smaller echoes of it, is always less satisfactory than a group in which there is no suspicion of an attempt on the part of the secondary features to ape the principal one. There should also be a very restricted limit to the number of these secondary features; or, at any rate, neither the same design nor even the same general outline and proportions must be repeated too often; and never repeated in features which occupy different situations in the composition. Such repetition leads to both redundancy and the most poverty-stricken kind of monotony.

In buildings like the Gothic cathedrals, in which the horizontal lines radiate from the centre, and consequently, when seen in perspective, run up instead of down, I do not think that any secondary features to break them are required. A little turret or group of buttresses to stop the composition seems sufficient. It may appear a rather daring thing to say, but the western towers of cathedrals in most cases seem to me a mistake. They are generally far too large in scale, and too similar in form to the main central tower, to group well with it; and they are at one extremity of the composition in most views, balancing, if one can call it balancing, nothing at the other end; which indeed, where there is an apse, is sloping downwards in a very undignified way. The Romanesque architects, in this respect, managed better, generally getting towers or turrets at both ends. Perhaps, where there is an unusually long nave, something smaller than towers, not placed at the extreme end, but a little way from it—say, another transept—would have been an advantage; but Salisbury has not anything, and, even apart from its size, it is a far more pleasing composition than Lichfield, with its three spires. Western towers, with nothing large enough over the crossing to hold its own is a gigantic mistake. Of which Cologne Cathedral is the typical example.

The breaking up of sky-lines is a thing that has often been recommended; but while it is, as before remarked, generally necessary to break a long one upwards or stop it at the end, to break it by a drop or cut through it is a thing to be avoided at almost any cost, and to do so for choice is to make a very serious mistake. It is still worse to break through a main cornice. These lines are perhaps the most important in a composition. They are wanted to hold it together, and give it unity and strength, and to cut through them is like cutting the cords of a bundle of sticks, and allowing it to fall to pieces. The fine art museum at Lille has this fault in an astonishing degree for a building that is admirably designed in almost every other respect, and detailed with a skill that few of us could equal. It really looks as if it wanted a chain or cable round the top to prevent its falling apart.

After solidity and unity, one of the most important things to be seen to is character; and one of the chief elements in character is scale. Small parts tend to delicacy and prettiness, large ones to strength and grandeur. Small parts are supposed to make a building look large, and large parts to make it look small; but the influence of scale in that respect is probably greatly overrated; a man near, or any object the size of which is familiar, trees and surrounding buildings, and so on, give to the eye a just impression of scale which no exaggeration, in either direction, of the details of the building itself can do very much to remove. The attempt to give an impression of size by this means is supposed to be not only legitimate, but praiseworthy. But it is after all a species of deception, and one which really defeats its own ends; for there can be no object in trying to exaggerate the size of a building unless it be to produce an impression of grandeur; but small details necessarily suggest delicacy and thinness, qualities absolutely opposed to grandeur. If the smallness

be more than is reasonable, or rather, more than is customary, the structure even begins to look like the model of a larger one. It is of course possible to go too far, and to make details so large that they become coarse and vulgar. But for a public building, or any great architectural work, it is essential to its character that the parts shall be large enough to look exceptionally substantial, to suggest big piers, thick walls, a general massiveness, and, above all, largeness of idea and an avoidance of pettiness. Substantial construction may be suggested without the use of ornamental details by setting the door and window frames back and showing deep reveals, by the use of large material, by plenty of unbroken wall, and in other ways; but the simplest treatment calls for a little detail of some sort, the scale of which will help to give character and in public buildings should be large. Particularly the projection or relief should be adequate, since it is that which most suggests the existence of plenty of thickness. Thus attached columns, besides being more delicately shaded, and therefore more beautiful, are also a far finer treatment than pilasters. Unfortunately, they are also more expensive and more difficult to deal with, but that is by the way.

Whatever the scale is, it is most important to use it consistently. One used to be told that you must not have two scales side by side, but that is a mistake; there is no harm in having a nave arcade of large arches and a wall or screen arcade of small ones, nor in using a large order on the walls and a small one for window dressings. What is inexcusable and destructive of harmony is to put a cornice, consisting of a number of small mouldings, on the top of a pier, the cap of which is composed of a few large ones, or to give the nave and screen arcades the same sized mouldings, or, to take a commoner case, put to the same building a block cornice composed of small mouldings and a plinth of one big one. This is a matter which is not unfrequently overlooked in the sculpture and carved ornaments of a building, even when there is no fault to find with the architectural details. One sees light, delicate carving in low relief lost under large, heavy pediments and cornices, and, on the other hand, great coarse figures supporting or sprawling over mouldings which seem by contrast mere threads.

Sculpture, and what is called architectural carving, are generally used to emphasise certain points, or, as it were, to punctuate the composition; and to a certain extent also to cover up awkward lines or spaces, which, by management of their own lines, they can be made to correct or obliterate. But although these uses are legitimate enough, it is most effective in broad masses such as deep bands and friezes, and particularly, strange as it may seem, in the half lights under cornices, pediments, and the like; perhaps because it breaks up and gives richness to the shadows.

Attempts to deal definitely with the light and shade on the exterior of a building meet with little encouragement from the weather in our climate, where, during so much of the time, it is difficult to see the difference between the two unless the shadow is a very black one; and an architect who depended on them alone would only get his effects for a few hours occasionally. It is, however, a very important subject, and always worth considering. The broader lights and shadows of the masses and breaks in a composition, of course, change in shape as the earth moves round the sun, and at first sight it seems as if it would be too complicated a matter to try to do anything with them. Such is not, however, altogether the case; for a consideration of the fine effect produced by a broad shadow might often influence the depth of a break if the designer thought about it; and if he remembered how beautifully a round surface curves and softens the edges of a shadow cast upon it, he might sometimes be influenced in favour of such a form. It is also true that a lighted surface may be thrown almost entirely into shadow by breaking up the surface, provided the aspect be favourable. But it is in what may be called the incidental shadows that most may be done. Incidental shadows arise from making recesses in lighted surfaces, or in contriving projections from them. The most beautiful of such shadows are generally deep horizontal ones, such as that produced by the little galleries under the eaves of Romanesque buildings, which answers to that under a classic cornice, but is stronger and beautifully enriched by the sparkle of light on

the columns. Neither light nor shade, although they should be in broad masses, want to be in quite flat, unbroken ones. If there are a few windows or holes to give black spots, and a few projections, such as mouldings or balconies, in the lighted surface, and different depths of darkness in the shadow, both are richer and appear stronger. The finest broken shadows are those formed by a covered colonnade with a wall behind, giving delicately graduated shadows on the columns and a deep one on the wall; such a feature also suggests solidity. But in criticising the main façade of the Louvre, Mr. Fergusson finds it vexes him, because he assumes (quite gratuitously) that the back wall does not run down to the ground, and he wants to know what it stands on.

In interiors the management of light is one of the most important means of obtaining good effect. Instead of trying, as we too often do, to merely get an equal flood of light everywhere, that is precisely what we should try to avoid. Enough, people say, is as good as a feast; and doctors tell us it is much better. And so it is with light; enough is one thing, an all pervading glare quite another. I do not advocate dark corners, which are a disgrace to any architect, and only lead to the use of artificial light. There is no credit in doing our work well if we are going to ignore practical conditions. But a contrast of light and shade is as necessary inside as outside, and in this a country we can do far more with it inside. A corridor equally lighted throughout its length is perfectly uninteresting, though the light be from the side or the top; but one which is crossed by a broad patch of light that increases the obscurity of the comparative shadow beyond is interesting at once. A definite light from one side, or from above, casts shadows and gives form to objects, whereas an equal light all round casts no shadow, and destroys form and distance. The worst light is one directly in the spectator's eye; not only is it physically annoying, but it shows everything in equal shadow. The best light is often said to be a top light which throws all the upper part of the apartment into shade and lights the floor and lower part of the walls. But light high up in the walls, which lights the ceiling and leaves the lower parts in comparative shadow is even better. The now common practice of putting electric lights close up to a modelled ceiling, throwing a grey shadow over the ceiling but bathing everything else in a flood of light, is really a terrible arrangement.

In internal effects generally we are at the present time, in our public buildings, immeasurably behind the architects of other ages, and even of our contemporaries in other countries. Any attempt, for instance, at a really fine staircase such as is usual in the public buildings of France or Germany, or at a spacious hall, almost always frightens people if it is made. And it is seldom made because ninety-nine out of a hundred of our public buildings are the result of competitions in which architects are asked for an amount of accommodation which can only just be provided, if it can be provided at all, for the cost; and although it is sometimes stated that corridors and staircases are to be ample, every one knows that what would be considered the minimum in France would be regarded as sinful waste in England.

Decorative painting and sculpture are in much the same case. A proposal to employ an artist of eminence for such work, as is always done abroad, generally causes an architect, in this country, to be looked upon as a candidate for Earlswood. If he names an adequate amount as the cost of getting such work properly done he is often told that he does not know his business; that the local decorator or carver only charges so and so; and unless he is a very strong man, or a very subtle one, all his labour in composing his building will be often lost at the last moment by its being spoilt with vulgar ornament, to gratify the parsimonious instincts of a public body which, unfortunately, can quote the government of the country as an example.

I have only been able to touch on a few prominent points of my subject. It would be as easy to measure the universe with a two-foot rule as to put the art of architectural composition into a few pages of foolscap. Such matters as emphasising vertical or horizontal lines, or emphasising or suppressing both, to give expression or character to a composition, the subject of proportions generally, and many

other things will, I hope, be touched on by others.

Mr. J. M. Brydon, in proposing a vote of thanks to the lecturer for his paper, said it was one of those subjects which ought to interest all architects, and especially young architects. Composition was one of the subjects which lay at the root of all architecture, and for some reason or other it was the subject which had the least attention devoted to it at the present time. Mr. Baggallay had touched on the main points which helped to make composition in architecture, and which assisted in making a building great or small, irrespective of size; but he had not brought forward some points quite as prominently as might have been expected—for instance, the influence of material on composition. Material had always had an immense influence on the form which a building took, and naturally on the features, which helped to make up the composition. The nobler the material, the nobler the composition, and, possibly, the higher as a work of art the building would be. In all stones, especially marble, for instance, the nobility of the material was evident, from the largeness of its parts, or the colour that could be got from it, and in such a way a great effect could be got by simple means—far greater than with a material of less nobility, such as brick, or that latter-day abomination, terra-cotta. Probably nearly all the great temples were developed from wooden construction, but immediately the era of wood-work gave place to stone, the whole construction became a stone construction, and hence the great power and majesty of such a building as the Parthenon. In our public buildings, if we wanted to get great majesty and dignity, we must go back to the original grand building materials, viz., stone or marble. To attempt to produce a great building in a small or less noble material would be more or less of a failure, that view having been emphasised by several public buildings, which had been erected in modern times, especially where terra-cotta had been used. He thought it was nearly impossible to get a great building with a material which was not constructive, but decorative like terra-cotta. As an example, he might quote the Science School at South Kensington, where terra-cotta was legitimately used. They there got over the difficulty in a more satisfactory way than when a building was constructively thought out in terra-cotta. In the great hospital at Milan there was some beautiful terra-cotta work used in a decorative sense. Another important point with regard to composition was the site which the building had to occupy, and a notable instance of a building being well adapted to its site was the Palace of Justice at Brussels. The church of the Salute, at Venice, was also admirably adapted to its site, and as one approached it from the water the reflection in the water seemed to be broken up by the ripple of the water. Nothing could be finer on the low site. With all deference to Mr. Baggallay's opinions, it was not the composition but the height of the tower which was wrong in the design which had been exhibited. He was therefore inclined to differ from the lecturer, and he thought that it added to the dignity of a tower to see its lines, or some of them, go down to the ground. A successful instance of a tower not being carried down to the ground could be seen at the Glasgow Town Hall, where at various distances the tower, which rose from the courtyard, could be seen rising over the building; but even there one felt a desire to see the tower go down to the ground, as did the wonderful towers of Wren's churches. Too much attention was given to picturesqueness in these days, as well as to what was called detail. Unless a building had good proportion, dignity of parts, and unity, no amount of picturesqueness and detail would ever redeem it from utter commonplace. The first principle should be that the body must be right before the members could be, and that principle was at the bottom of all composition in architecture. The lecturer was right in saying there must be some dominant feature in the composition, and that towers, for instance, must not all be alike. Another little weakness which was allied to this so-called striving after picturesqueness was the want of reticence, or simplicity, want of restraint—the attempt to put "all the goods in the shop window." To young architects he would say, "There is no hurry; when you have a building to carry out don't think it is the last and only one

you will ever erect; and don't crowd all you know into your design." Such things were usually done by young men, but time cured all that, and they would learn that all such efforts were thrown away. What permanently remained were the broad simple masses, and the grandeur of outline which was only to be obtained by an earnest study of the principles of composition. Remember that Inigo Jones, one of the greatest architects we ever had in England, and a master of proportion, had a contempt for what was mere prettiness of detail. One of the finest works in composition was Greenwich Hospital, which Jones commenced and Wren completed. That was an example of building in a noble material on a wonderful site. It was the fashion nowadays to treat style with contempt, and if an architect designed in a particular style he was looked upon as old-fashioned, for the idea seemed to be that every one must do something original—just as though style had not developed gradually and could not be produced all at once. In the words of that great master, Inigo Jones, architecture should be solid, proportionate, masculine, and unaffected. When they had it so they had a great composition, but not otherwise.

Mr. H. H. Statham, in seconding the vote of thanks, said that the subject was a fascinating one but, as the lecturer had said, it was so great that one hardly knew on which side to approach it. There were one or two matters in the paper which suggested points for further consideration. He was very glad, for instance, to hear some one in that room run a little tilt against the theory that all architecture was dead at the Renaissance, for he considered that that was a complete mistake. Fergusson and others got hold of half the truth and treated it as if it were the whole. There was no doubt that the theory of architecture completely changed at the Renaissance, but nevertheless, since then there had been a great deal of thoroughly original architecture; although it took some of its detail from antique styles, it did not take its design or composition. It was rather amusing, although it was perhaps not good-natured to say so, to hear Fergusson put through the mangle, though he thought that the time would come sooner or later. Fergusson would not have minded; he had a calm conviction that he was always right, and the lecturer's criticisms would not make him turn in his grave. No doubt there was some truth in Mr. Baggallay's criticisms. They must all have felt that a great deal of the criticism in Fergusson could not be accepted, and there was no doubt that Fergusson allowed himself to be so far led away by the enthusiasm of the moment as to refer to various buildings in town as the greatest or finest in the world. But he thought that Mr. Baggallay had done Fergusson a little injustice, because Fergusson did not give his whole attention to detail. If they went fairly through his works they would see that he grasped the fact that the idea of the plan was the basis of the whole design. Fergusson had in his mind that a building was to be judged by the conception of the plan, and what was put upon it, though, no doubt, he gave a little too much attention to detail. As the lecturer had said, detail was overrated; the real test was the composition. But was not refinement of detail a very good means of judging of a man's refinement of conception, and the attention which he gave to his art? Mr. Baggallay had drawn attention to a most important idea, as to showing solidity of a building by raising the interior portion of it. But he (the speaker) was inclined to think that in the case of a tower it was better to see the lines carried down to the ground; the whole composition was improved by putting the tower in the centre, but the tower itself was not improved. Then, again, there were occasions when a building was placed at an angle or junction of two streets where the angle became a very prominent part of it, seen down two principal thoroughfares; and it was quite right to accentuate the building by putting the tower at such an angle; it became the key-stone, so to speak, of the whole building. The whole question depended very much upon the site. In regard to the treatment of roofs in composition, the lecturer had exhibited an illustration of a French Mairie (Neuilly) which showed how not to do it. The central roof, instead of being carried on to the end pavilions, was designed so as to leave a gap between them, with very bad effect. He did not care for the detail, and yet he wished that such sculpture could be seen on English buildings

as there was on the Neuilly Town Hall. The great inferiority of many French and German Cathedrals in their want of a central feature arose, of course, from the ambition of the builders. They wanted to carry their building to a great height, but they dared not, for structural reasons, put any large feature on the central piers. In regard to upright features, the lecturer seemed to think that it was almost always better to carry the cornice round them. That depended upon circumstances. There was a most clever and original building in Edinburgh, the McEwan Hall, where there was a set of buttresses, large, solid, stone projections, round which every string and cornice were carried. He thought that if the buttresses had been left to go up as masses of masonry and the string courses had been allowed to butt against them, the effect would have been more powerful. He quite agreed as to the importance of a fine staircase and the difficulty of obtaining this in England where it was considered a waste of space. He agreed also with what the lecturer had said about too much attention being paid to picturesqueness. He was afraid that there was rather a tendency in these days of competitions to endeavour to catch the eye by picturesque perspectives, instead of by a logical and well-worked out plan. That was one of the evils of competition, which had its disadvantages as well as its advantages. With regard to a design for the Imperial Institute, to which the lecturer had referred, though it was a very fine-looking design, it was rather an example of composition being too independent of the plan. In order to get the fine effect of the circular sweep a great deal of space was left on either side of the building, of no particular shape, and of which no use could have been made. Unless the sweep arose out of the plan, it was a thing to be avoided. In regard to the German Parliament Houses, something more might have been said in the paper than that the dominant feature was kept too low, viz., in regard to its ugly outline and its want of monumental character. He thought that was the worst central feature of any large public building of importance that he knew of. In a central feature of that kind, if they chose to keep it low, they should make it a monumental instead of a glass and iron structure, which lowered the whole effect of the building.

Mr. A. T. Bolton said that with regard to the German Parliament Houses, he remembered seeing it stated in a foreign paper, at the time the building was opened, that the committee, and not the architect, was responsible for the central feature, which was lowered materially from the original design. The result was very unsatisfactory, as, he believed, the building was in other respects—though it was satisfactory to know that the architect was not responsible for that central feature. Whatever they might say about architecture, was apt to resolve itself into a personal opinion. With regard to the position of towers, he did not think that the towers of the Houses of Parliament, as they were placed, were a mistake, though no doubt Mr. Baggallay would answer that another feature, the central tower, first suggested by the ventilation scheme, had been introduced, and so balanced the composition. In regard to the illustration with the movable tower, which Mr. Baggallay had exhibited, one point about it was that, if it were put in the position suggested by Mr. Baggallay, it would have to be a great deal higher, because, directly such a feature was put behind the main walls, it had to be made very high to get it to stand out at all. The Brussels Law Courts, seen from the outside, was a very fine composition, because this necessity had been borne in mind; but the effect inside was terrible: it was like looking up into a well. With regard to French cathedrals and churches, the French Romanesque churches had nearly always a central tower, just as the Norman buildings in England had. But later the French realised what an effect they could obtain by great internal height which rendered impracticable a massive central feature. He thought a Frenchman would be horrified by the remarks which had been made as to the detail of modern French buildings, and, after all, was it not a question of education? The detail of French buildings was, if they granted the premises, about as fine as it could be. The whole ideal of the French, which was very arbitrary, was that there were certain models left by the Greeks or Romans, and the thing was to apply them. A French student did not study old works in general

as an Englishman did. A Frenchman looked at everything with the eyes of the Ecole des Beaux-Arts, and if we took a building like the Ecole de Médecine, we could hardly have any detail better suited to its design. A good deal of the speciality of French detail arose from the peculiarity of the stone used, and the custom of working it in position. He did not think a great central feature was always needed, and some fine buildings could be mentioned with purely horizontal lines, such as the Pitti Palace. The idea of not showing the roof of a building was Wren's, who thought that there was no roof worth showing, except the spherical. He thought that Mr. Brydon had been very severe in his remarks on brick. In his, the speaker's, opinion brick did not always have a fair chance, but as it was, sometimes exceedingly dignified buildings were put up in brick. He might mention the Spanish palaces at Saragossa, for instance, and certain old Roman walls, which had a grand effect. The reason why the use of brick was not generally more successful was that we used it often with stone detail. Every brick got a moulding on it, so to speak, and each brick had a certain emphasis; but in grand examples of brick architecture the bricks were thrown in like cubes of mosaic, creating large surfaces, the effect of which was very noble. The Horse Guards' building was not finished by Kent, and Ripley was responsible for carrying out the central turret, which accounted for its bad treatment. He might mention that Mr. Reginald Blomfield's recent book on the Renaissance contained a good theory and examination of what Renaissance architecture in England amounted to. The plan for the Imperial Institute exhibited, was the resurrection of a plan introduced by Inigo Jones at Stoke Park, which was developed by Wynne, Vanburgh, and Leoni, and finally by Barry at Cliefden, where he was working on lines that Wynne and Archer had laid down. They started with the works of Palladio, who built villa-palaces out on the main land for the Venetian nobility. These buildings consisted, not only of a house, but also of farm buildings as wings to the main block, where the basement also was used for storage, &c., the apartments being upon the first floor and reached by a great portico and external staircase. Palladio was enabled to produce some grand conceptions in this way, which delighted every one, including people in England; but the difficulties of carrying out such designs in this country were enormous; the Englishman did not want the farm buildings in conjunction with his house, and he had a fancy for the ground floor for his own use. If they looked through the Vitruvius Britannicus they would be able to see what efforts were made in this direction, and the difficulties that arose from the abolition of the farm buildings. As Mr. Statham had pointed out, it was hard for the modern architect to know how to utilise the wings and quadrant connexions of such a plan who had not the courage of the architects of Vitruvius Britannicus to label the vacant space "waste" or "this room to spare."

Mr. A. S. Flower said that what Mr. Bolton had described as the Italian view of planning seemed to be still in favour in Ireland, in preference to the English one. He had been asked some time ago to make some alterations in a house in Ireland. He was told that the kitchen court, stable yard, and farmyard must run together, and that all the domestic arrangements would be upset if any separation were introduced. With regard to the question of position of towers, he was inclined to the views of the lecturer, for he thought a much better effect could be obtained if the tower were not carried down to the ground. The effect at Salisbury Cathedral was very good. In most drawings of village churches, where the tower went down to the ground, the effect was certainly improved by putting in foliage, tombstones, &c., leaving the lower portion undefined. A central tower was better, in his opinion, than such a tower as the Victoria, where everything was carried right down to the ground and attention too much concentrated below. He hoped that what Mr. Baggallay said about binding towers together would be borne in mind. The central tower of Lincoln Cathedral was spoilt, in his opinion, because this point had not been attended to. If they looked at the illustrated professional papers, they frequently saw designs for towers which were a mass of buttresses with hardly any cornice at all. In the newer kind of design this idea of doing away with connecting or tying lines seemed to be the

fashion, and, like the author of the paper, he thought it was a most perverse one, which he would like to see disappear. However, he might point out that sometimes if the cornice were carried round too consistently at an unvarying level they lost some effect in the building, as might be seen at the Langham Hotel and the new Record Office.

Mr. Banister F. Fletcher said that he thought architectural students should read Burke's essay on the "Sublime and Beautiful," for there were many points connected with beauty in architecture which the author explained quite admirably. According to Burke, beauty was not always a question of masculineness. Though Mr. Brydon's theory in regard to that as applied to public buildings might hold good, in small buildings it would not do at all. As to the lecturer's remarks about the shadow of a great cornice, unfortunately in northern countries we did not get the advantage of the Classic cornice. In such countries vertical lines, as given by buttresses, in English cathedrals, &c., were more valuable. He thought that Mr. Baggallay's paper should lead them to consider why they did not study composition. It was most extraordinary that they did not, seeing that the most valuable part of an architect's education consisted of learning how to compose and design public buildings, and a class for the study of composition could very easily be formed, say, by collecting a number of plates from the architectural journals and treating the designs in some such way as Mr. Baggallay had dealt with the design with the movable tower. If such a class were formed, and the composition were studied of buildings which had been designed, a great deal would be learnt by them in the design of public buildings, which, as far as England was concerned, was left to chance as contrasted with the design of public buildings in other countries, especially France.

The Chairman said that they were indebted to Mr. Baggallay for his thoughtful paper. In regard to the composition of towers and their height Mr. Baggallay would no doubt reply to some of the criticisms that the tower must always be considered in relation to the site. He was sure that Mr. Baggallay would not wish them to take what he had said as matter for their complete guidance. It must be remembered that site was at the base of composition, and this was especially the case in town architecture, rather than with architecture in the open country. In towns they nearly always had something which affected the scale of their buildings. With regard to the influence of material on composition, there was not only the question of material to be considered, but also that of colour in its relation to composition. Whatever they might say in regard to brick, they had it always with them, and they must take it always into consideration. It was a material which was largely used, and it could not be looked upon as a decorative material, and where it was used in connexion with stone, it very naturally affected composition, and might considerably mar the design of a building unless the use of the material were very carefully considered. In regard to the position of towers in church buildings, the lines of a central tower, while they were not actually carried down to the ground, were suggested, for the tower at its junction with the nave was of the same width, and this gave the same effect of stability as though the tower were carried down to the ground. A good deal depended, however, upon the proportion of the tower as to the position it occupied in the composition. With regard to what the lecturer had said as to the repetition of a feature, that he thought, applied more particularly to towers than to domes. His own impression was that where there were a number of domes the effect was satisfactory, and he would differ from the lecturer if he applied the same rule to domes that he did to towers. Mr. Brydon's remarks in regard to the present-day study of picturesqueness and detail, rather than composition, were particularly welcome. No doubt there was such a tendency prevalent. The feeling existed that in regard to the smaller buildings there was not much chance of composition, and where they had no particular feature to give character to a building they were tempted to favour quaintness and picturesqueness to the exclusion of grander ideas as to composition. In regard to the question of the smallness of detail, he was glad to hear Mr. Baggallay's remarks. In London there were buildings which, in his opinion, were spoilt on account of the detail being so

small. He thought they could have refinement in detail and at the same time have boldness. It was the pettiness of detail which spoilt the scale of the building, and he was inclined to think with Mr. Baggallay that in such a climate and in such a city as ours it was more important to seek proportion in buildings, and breadth of detail, than that we should seek a lot of detail and pettiness in that detail. Of course, the question of detail and decoration largely entered into the subject of composition, but the main points of composition grew out of the plan, which was the first thing to consider in designing a building, and if we were to consider a little more carefully the main points which the lecturer had raised, and particularly the question of depth, the result would be an improvement in our buildings.

The vote of thanks having been put and carried unanimously,

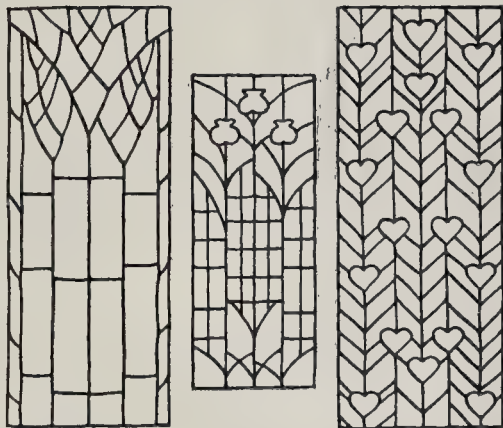
Mr. F.T. Baggallay, in reply, said that he had overlooked the fact that material influenced the general composition of a building through the details, as it were. As Mr. Brydon had pointed out, the beauty and exquisite finish to be got on marble leads to simplicity, while the facility with which ornament in terra-cotta could be employed led to thinking in terra-cotta, and so keeping things small. In regard to towers, he thought he stated in his paper that the tower itself would lose in effect unless carried to the ground. If they wanted a fine tower, no doubt they would have to carry it to the ground, but if they were thinking, not of the tower, but of the whole composition, the tower should be put behind, and in some position where it formed a central feature, rather than at the outside, or at a corner, even at the junction of two streets. He did not quote Greenwich Hospital, because it was one of those exceptions to his rule which required an Inigo Jones and a Wren to make it successful. He did not advise any ordinary architect who wanted a fine building to put up two wings in such a way that people could see right through them. As to the self-contradictory statements contained in Fergusson, he had come across passages where the reason for liking one building was given as the reason for disliking another. Fergusson's book was a most useful one, which gave one many excellent ideas, but he regretted that it was considered such a standard work, as, in his opinion, it was dangerous to young students who did not know how to sift the good from the bad. He wished that somebody would write a work to take its place. Mr. Statham had referred to the refinement of detail being really pleasing apart from the composition of the building, and he (the speaker) understood he said so because an architect could be judged by the refinement with which he dealt with the detail. One of the tendencies of the present day was, he thought, to think too much of the architect. If the only use of refinement of detail were to judge the architect, he would say: Never mind the detail at all. He had, perhaps, exaggerated his contempt for detail, but he thought they would get more refinement if they kept to the old work than if they tried to invent new detail for themselves. Detail might be coarse and bad, and thus spoil a building; but they would not find coarse and bad work in old buildings; they would have to invent it themselves if they wanted it. The roof of the Hotel de Ville, which Mr. Statham had referred to, was an example of breaking up the roof precisely like that of the Art Gallery at Lille, and it had the effect of preventing a building looking like one mass. In regard to carrying cornices round corners he did not say that that should always be done, but as a rule. There were exceptions, and perhaps the one which Mr. Statham had referred to was a case in point. That would be one of the difficulties in regard to the proposed class of design: there would be almost as many exceptions as rules in such a subject, and any one who tried to lecture on it would find pitfalls on every side. It was news to him that the square dome of the Berlin Parliament Houses had an iron and glass roof.

Mr. Statham said he was not absolutely sure about the point, but he had a very strong impression that that was so.*

Mr. Bolton expressed the same view, and said that the same thing had been done at the Tate Gallery.

Mr. Baggallay, continuing, said that it seemed hardly credible that such a mistake as that had been made. There seemed to be a general opinion in this country that square domes were

* The statement was quite correct.—E.C.



Designs for Decorative Treatment of Leaded Glass. By Miss E. M. Steadman.

ugly features, but he doubted whether they were always ugly features, and he thought they might sometimes be used by English architects. The Houses of Parliament was a fine building, but he did not think it owed its beauty to any grandeur or to its composition: its effect was due chiefly to its richness—to the constant repetition of small detail, just like some of the small Flemish buildings. As regards the two towers of the Houses of Parliament, he thought that as affecting the composition they were wrong, though they were beautiful in themselves. To put one tower at one end and the other at the other was a mistake. As regards bricks, he agreed with Mr. Brydon that they could not have a really great building if they erected it in brick, because of the smallness of the material. Large stones could be used but not large bricks. In regard to Mr. Fletcher's remarks as to the classic cornice not giving in this country so strong a shadow as it did in other countries where there was more sun, he thought that the vertical lines which had been recommended were rather to be avoided, as they had the same effect of pulling a building to pieces as cutting through the cornice had, unless they had some big cornice or some deep shadow to pull it together again.

The Chairman announced that the next meeting would be held on the 4th prox., when Mr. John Belcher would read a paper on "Hampton Court Palace," which would be illustrated by lantern views.

The meeting then terminated.

DESIGNS FOR LEADED GLASS.

The illustrations show some designs for glazing arranged to give interest by means of lead lines, which have been carried out by Miss E. M. Steadman and Miss Rayment, who have started an atelier for the treatment of glazing by this and other methods.

The material used is blown glass, which is considered most suitable for the kind of treatment on account of its quality, clear colour, and varying thickness.

The drawings show the work to about $\frac{1}{2}$ in. scale.

REDOS, GIRTON CHURCH.—At the church of St. Andrew, at Girtton, a redos has been erected, and other improvements to the chancel have been carried out. The architect was Mr. T. D. Atkinson.

SIR W. RICHMOND'S LECTURES.

THE second of Sir W. Richmond's Royal Academy Lectures, delivered on Thursday of last week, was devoted to the subject of "Greek influence upon Italian Art;" his position being that there was never any entire break in the Greek tradition,* and that it could be traced as an influence from antique times into the full period of the Renaissance, the latter movement being only a "revival" in the sense that it gave renewed impulse to a tradition which had never really died out. A large number of photographs from works of different periods, hung on the walls, served to illustrate this view. Among others was that of the curious façade of the Church of Castel del Monte, with its Italian Gothic door and window within and above a somewhat rude but quite palpable reproduction of a Classic order and pediment with a modillion cornice; for Sir W. Richmond never lectures merely on "Painting" but on "Art," including architecture as of the same importance with sculpture and painting (which is not the way of all R.A. painters). A number of photographs of Pompeian wall paintings were exhibited—the well-known type of dancing figures, with the photographs of two Greek vase-figures placed among them, showing a curious resemblance in style and pose. In Botticelli's well-known "Spring" the Greek influence was clearly traceable; while a Siennese picture in the collection, as well as other works, showed the tradition as conveyed through the channel of Byzantine art. Photographs of stucco ornaments from the via Latina at Rome indicated the origin of the types of Renaissance floral ornament. The mosaics of Ravenna and St. Mark, placed side by side, again illustrated the influence brought through Byzantine art. One of the most striking examples was shown in an illustration from Lafillée's "Peinture Decorative en France" from the eleventh to the sixteenth century, a chromolithograph of the decorations in the Château de Coucy in the thirteenth century,

* Browning hints at this idea in "Sordello," the action of which is laid in the early part of the thirteenth century—

"Witness a Greek or two from the abyss
That stray through Florence-town with studious air,
Calming the chisel of that Pisan pair:
If Nicolo should carve a Christus yet!"

where there are some details, especially a scroll ornament, which might almost have been taken from a Greek vase. (We presume it was considered that these were executed by Italians.) The general tendency of the lecture was to inculcate a broad view of the history of art, as being the record of a continuous influence, not broken up into precisely marked chapters of decay and resurrection.

In the course of his third lecture on Monday, Sir W. Richmond said that he suspected that the religion of the Greeks tended to the precedence of architecture and sculpture over painting. The colour sense among them was applied to textiles and embroidery, as well as to their buildings, and some terra-cotta ornaments found in great profusion in Sicily showed a very delicate sense of colour decoration. Before Homer's time, the art of painting was not practised, as we understand it, by the Ionic Greeks, though architecture was. The Etruscans appeared to have adopted painting at a very early period. The Etruscan tombs found in various parts of Italy might roughly be assigned to any date between 500 and 100 B.C. The Etruscans carried on commercial relations with the Egyptians as well as with Asia Minor, and Egyptian ornament was found on Etruscan tombs. The Copts, a section of the ancient Egyptians who accepted ancient Christianity, took over the art of Greece and Rome, and with that Egyptian art seemed to cease. Coptic design was wholly classical. In speaking of mosaic work, the lecturer said that mosaic, as we understand it, was of Roman origin, transported by Greeks into Sicily, Venice, and Italy. The Roman mosaic was not, in his opinion, particularly delightful; it was interesting; it demonstrated the art of a people who were luxurious, but not highly endowed with the æsthetic sense. He did not know of any mosaic picture of an earlier date than 70 A.D., viz. that representing the Battle of Issus, possibly a translation of some famous wall painting. In design the fragment was extremely fine, and, *quid* mosaic, it was perfect as an example of technical excellence, although the detail was not as minute as that of later mosaic workers. In the British Museum were several examples of very minute mosaic work. During a period of the Roman occupation of England, mosaic pavements were commonly placed in the homes of the rich folk. The Normans did not introduce into their own country the art of mosaic. Tradition told us that the Norman churches were highly decorated, and they broke up their mouldings with painted ornaments. This habit was not Norman only, for it existed at a tolerably early time in Greek architecture also, and however strange the practice, the result was often very beautiful. The mediæval decorator did the same, and he had been told that the ribs of the vaulting of Westminster Abbey were decorated in this way. In the post-Christian era, mosaic was used almost exclusively for church decoration or church service, and its influence was extraordinary, but was concentrated chiefly in countries exposed to Oriental influence. Speaking of colour in its relation to light and shade, the lecturer said that light and shade had a tendency to overmaster colour, and was wholly out of place in decoration. The ingenuity of colour in light and shade, which was shown both by the miniature painters and the wall painters in Italy, France, and even in England, up to the fifteenth century was a tradition handed down from the Byzantine artists. Mosaic was a very laborious craft even in its simplest form, and was not fitted for very small or refined work; though examples to the contrary could be cited. He did not mean to imply that subjects to be treated in mosaic must be of colossal scale, and that figures of life size were not suitable, for there were instances to the contrary. He desired to warn students who, against attempting to express themselves in a material ill-suited to the scale or motive of what they had to design. Titian, the most complete painter the world had produced, Tintoretto and Veronese, though unrivalled on canvas, were not consummate decorators, and mosaic was a material quite unsuited to show their gifts. While no one could fail to admire their works in St. Mark's, it must be confessed that they were inferior in effect to the works of inferior artists. The art atmosphere in Titian's time was Palladian, not Greek. The lecture was illustrated by a large number of photographs of mosaics, ivories, textiles, &c.

Illustrations.

SAINT MARK'S, VENICE.

GROUP OF COLUMNS AT THE SOUTH-WEST ANGLE OF FACADE.

THIS drawing shows the beautiful group of columns situated at the right extremity of the facade.

Few things have charmed me more than this cluster for grace and elegance. The lower shaft is of white marble showing blue veins, those above are mottled green, red, and various, the plinth on which they stand is green; the capital supporting this is a lovely Byzantine one turned a rich golden hue. How much is new, and how much old, I dare not say.

SOUTH-WEST ANGLE OF TRANSEPT AND NAVE AISLES.

One of the many charming cross views is here shown.

In the distance, below the candelabrum, is the usual entrance from the facade. The walls are lined with mellow marble, the soffits of the arches are in mosaic—the saints always bowing to each other—giving quaintness and brightness to otherwise oppressive shadow. The angle shafts are granite, the others are marble. The thickness of the arcading makes the gallery, though corbelling out is used to get round the piers, thus allowing more light into the aisles.

ARTHUR E. HENDERSON.

SURBITON MUNICIPAL BUILDINGS COMPETITION DESIGNS.

We publish together in this number the three designs which were "placed" in the Surbiton Municipal Buildings Competition. Our readers will remember that the Corporation of Surbiton selected for execution the design which the assessor, Mr. Mountford, placed second, and that there was a good deal of discussion in the Press, both as to the judgment of the assessor and the action of the Surbiton authorities. We thought, therefore, that it would be of some interest to publish in one number the three designs referred to, and the respective authors of the three designs have kindly seconded our intention by lending us their drawings, which would have been published earlier but for the intervention of which demanded prior attention.

We have already made our own comment on the competition, and give the three designs here without further remarks, except that we have thought it suitable to place them in the order of the Assessor's award.

The first design is by Messrs. Wimperis & East. They write in regard to their design:—"The plans follow the 'conditions of competition,' and were arranged to give the necessary accommodation and sizes in the most economical manner, without any projections, &c., to add to the cost. The Council Chamber was especially planned so as to obtain a certain amount of dignity and height.

The external materials were to be red brick, Portland stone, and red tiles on the roof, and the treatment generally was the outcome of a desire to express a municipal feeling combined with simplicity and economy of materials."

The second design, which is the one selected by the Council to be carried out, is by Messrs. Forsyth & Maule, who send us the following remarks in regard to their intention in the design:—

"The site is a corner one, with south west frontage to the Ewell-road. It is proposed to set the building line back 25 feet, the main entrance being into the Ewell-road for the public and staff, while a side gate is provided for the caretaker and tradesmen in the Berrylands-road.

As 5,000*l.* was the limit allowed by the conditions, it was found necessary to economise space and simplify details as far as possible, compatibly with giving all the accommodation required. As shown by the drawings, and allowing 300*l.* for entrance gates and walling, the building cubes up at 934 a foot.

The various offices are placed on the ground floor, the arrangement of which is shown by the plans. The first floor provides for the Council Chamber, committee rooms, waiting-room and cloak-room, and the whole of the caretaker's apartments are placed on the second floor, as required by the conditions of the competition.

The materials to be employed in the eleva-

tions are red brick, with stone dressings and green slate roofs. All mouldings and other finishings will be of a simple character.

Internally the floors in entrance hall and vestibule are shown of marble in plain squares, those to Council Chamber and committee-rooms in pitch pine in narrow widths.

The staircases will be of stone, and provided with wrought iron balustrades.

The Council Chamber will be panelled."

Messrs. Hewitt and Ryan-Tenison, in their report, say that their building has been planned on the simplest possible lines, in order to avoid expense and any confusion in finding the several departments—"A design of free but dignified English Renaissance has been adopted which would fitly express the purpose of the building. Balustrading, parapets, and other expensive features have been carefully avoided."

The elevations would be of red brick, relieved with dressings of Monks park stone; the floor fireproof throughout, and the roofs to be covered with green Westmoreland slates.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The fifth general meeting (business and ordinary) of the session 1897-98 of this Institute was held on Monday, at No. 9, Conduit-street, Regent-street, Mr. E. A. Gruning, Vice-President, in the chair.

At the conclusion of the business meeting the deed of award of the prizes and student-ships for 1897-98, made by the Council (in accordance with the terms of By-law 66), in writing under the common seal, was read by the Chairman.

*The Essay Medal and 26*l.* 5*s.**—One essay was received for the Silver Medal, under the following motto: "Heir of all the Ages," but the Council decided not to award the prize.

*The Measured Drawings Medal and 10*l.**—Six sets of drawings were sent in, of the several buildings enumerated, and under motto or device, as follows:—(1) A Flower (device); Thaxted Parish Church, Essex; (2) Clare Clare College, Cambridge; (3) Kot; (4) Quisen's College, Cambridge; (5) Labor omnia vincit; The Charterhouse; (6) A White Horse (device); Church of St. Helen, Cliffe at Hoo, Kent. The Council has awarded the Silver Medal and ten guineas to the delineator of Clare College, Cambridge, a set of drawings submitted under motto "Clare" by Mr. T. Tyrwhitt, and a Medal of Merit to the drawings of Thaxted Parish Church, submitted under the device of a Flower by Mr. Cyril Wontner Smith.

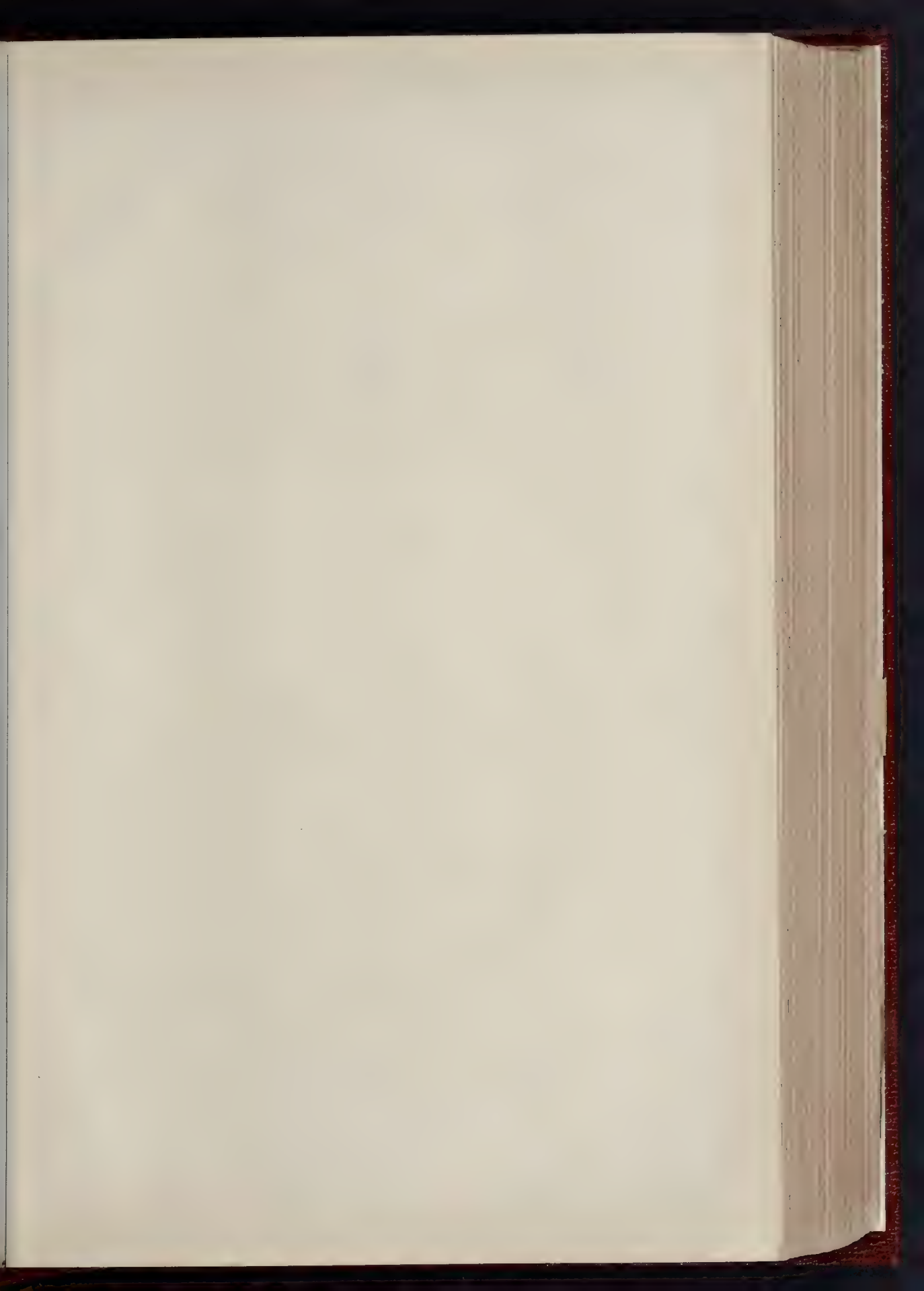
*The Soane Medallion and 100*l.**—Five designs for a Concert Hall were submitted under the following mottoes:—(1) "Pan;" (2) "Lyra;" (3) "34° South;" (4) Cornice; (5) Quod erat faciendum. The prize was not awarded.

*The Pugin Medal and 40*l.**—Four applications were received for the Pugin Studentship from the following:—(1) Mr. James B. Fulton (London); (2) Mr. Benjamin Bower (Birmingham); (3) Mr. Charles de Gruchy (London); (4) Mr. Ramsay Traquair (Edinburgh). The Council have awarded the medal and a sum of 40*l.* to Mr. Charles de Gruchy, and a Medal of Merit and five guineas to Mr. Benjamin Bower.

*The Owen Jones Studentship and 50*l.**—Two applications were received for the Owen Jones Studentship, from the following:—(1) Mr. Frank Lishman, London; (2) Mr. Ralph Scott Cockrill. The prize has not been awarded.

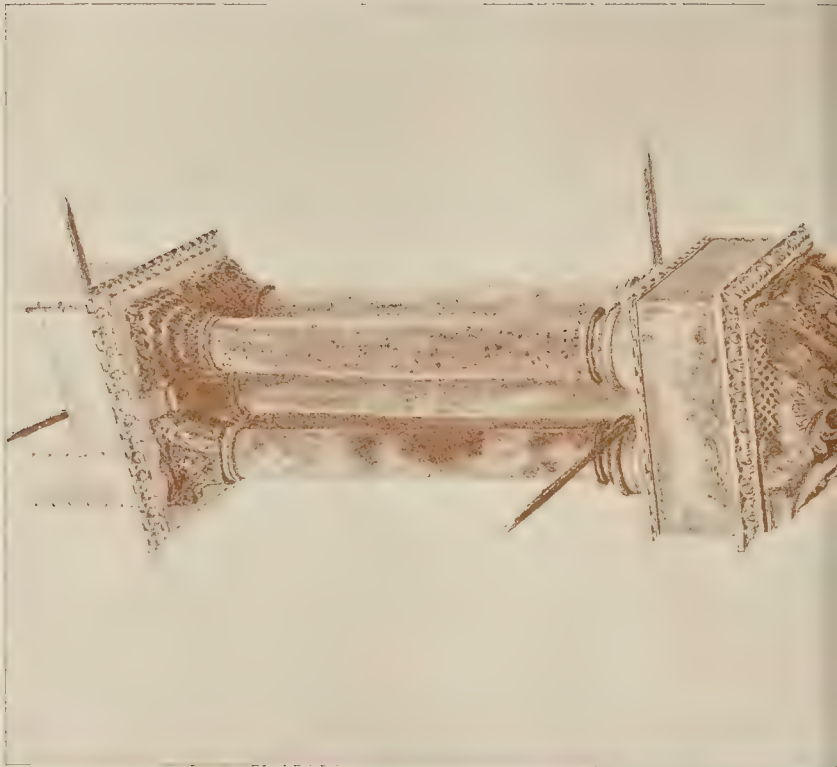
*The Tile Certificate and 30*l.**—Nine designs for a Villa and Ornamental Garden in the Italian style were submitted, under the following mottoes and devices:—(1) Triangle within circle (device); (2) Andante; (3) Van der-Neer; (4) Heather; (5) Orion; (6) Italian Grandeur; (7) White Star (device); (8) Lorenzo; (9) Tiber. The Council have awarded the Certificate and a sum of 30*l.* to the author of the design bearing the motto "Andante" (Mr. John Stevens Lee), and a Medal of Merit and ten guineas to the author of the design bearing the motto "Heather" (Mr. Thomas A. Pole).

*The Grissell Medal and 10*l.* 10*s.**—Twelve designs for a Small Country Church were submitted, under the following mottoes and devices:—(1) "Westminster;" (2) Simplex; (3) "Ajax;" (4) Thistle (device); (5) T. (in red ink); (6) Tudor Rose (device); (7) A Carpenter's Plane (device); (8) Fortis Gracilisque.



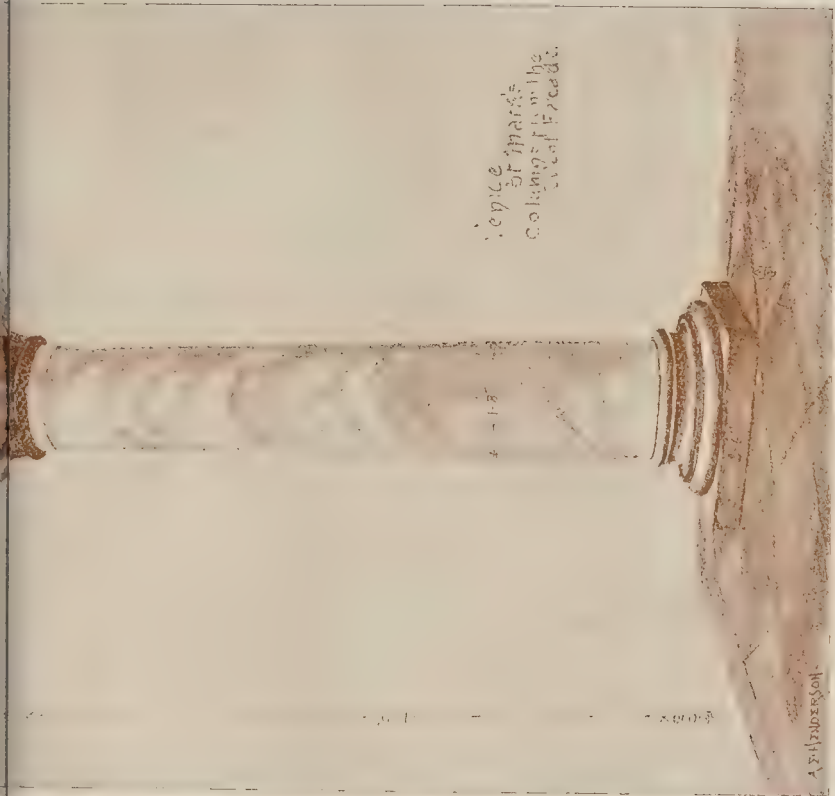


THE BUILDER JANUARY 22, 1898



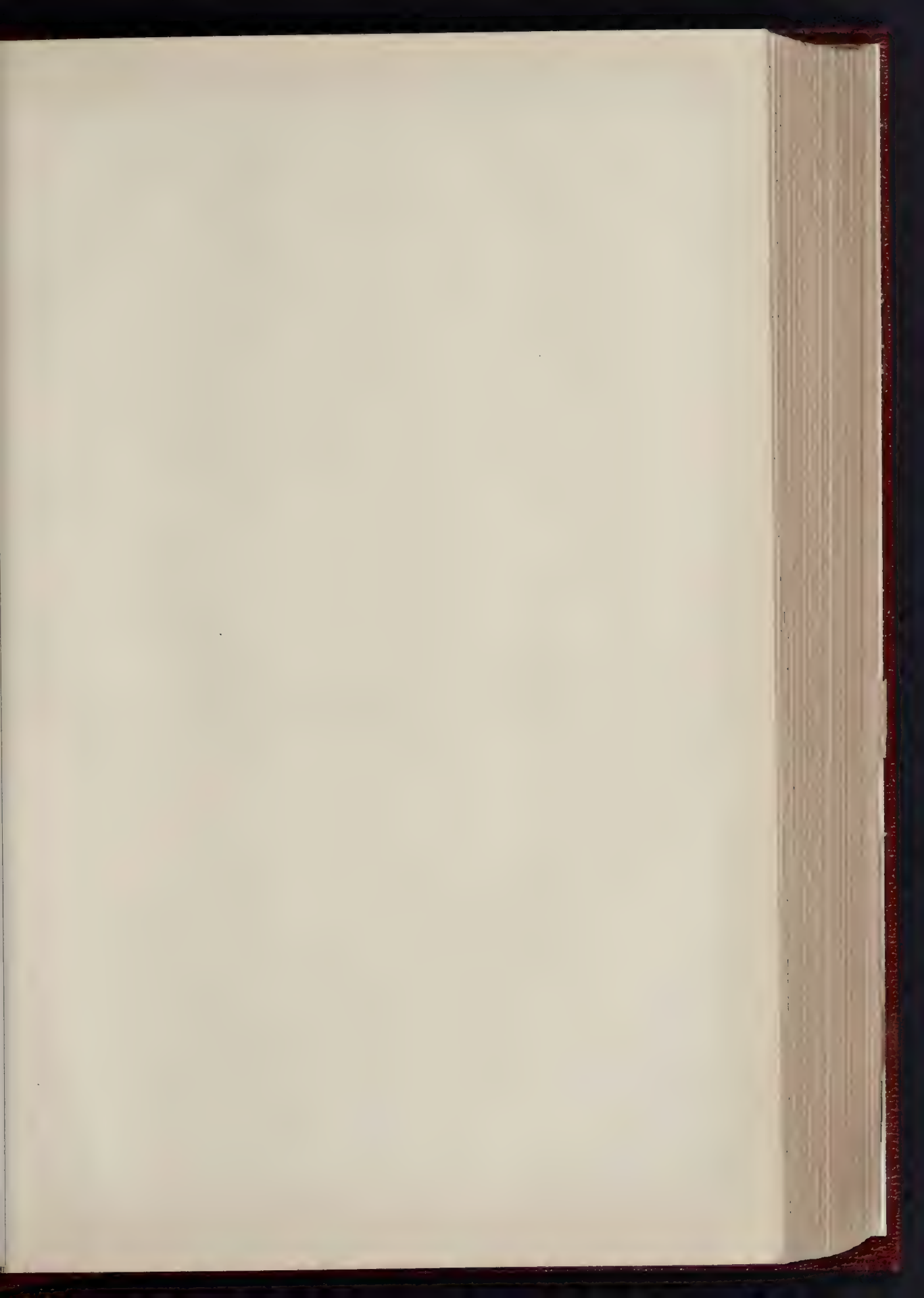


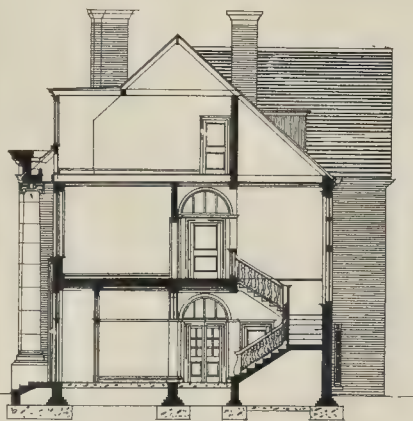
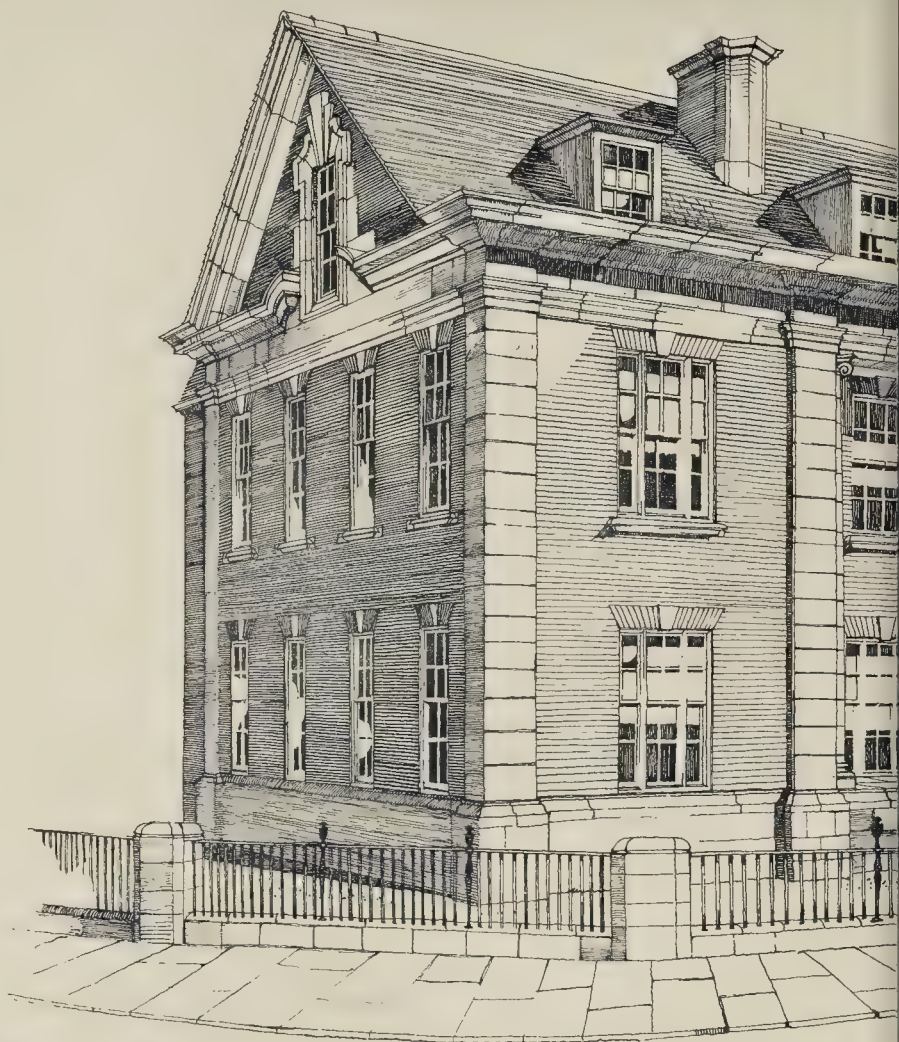
Statue in the archway
of the tomb of the
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Levee of the
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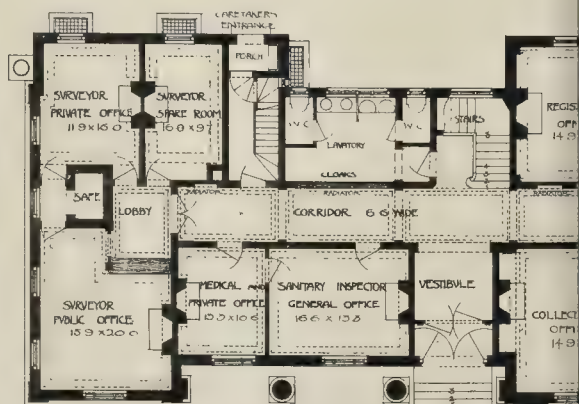
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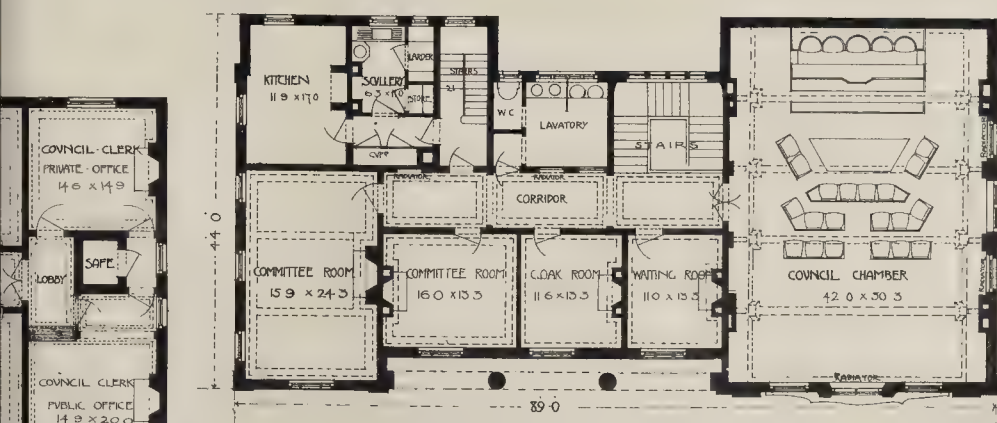
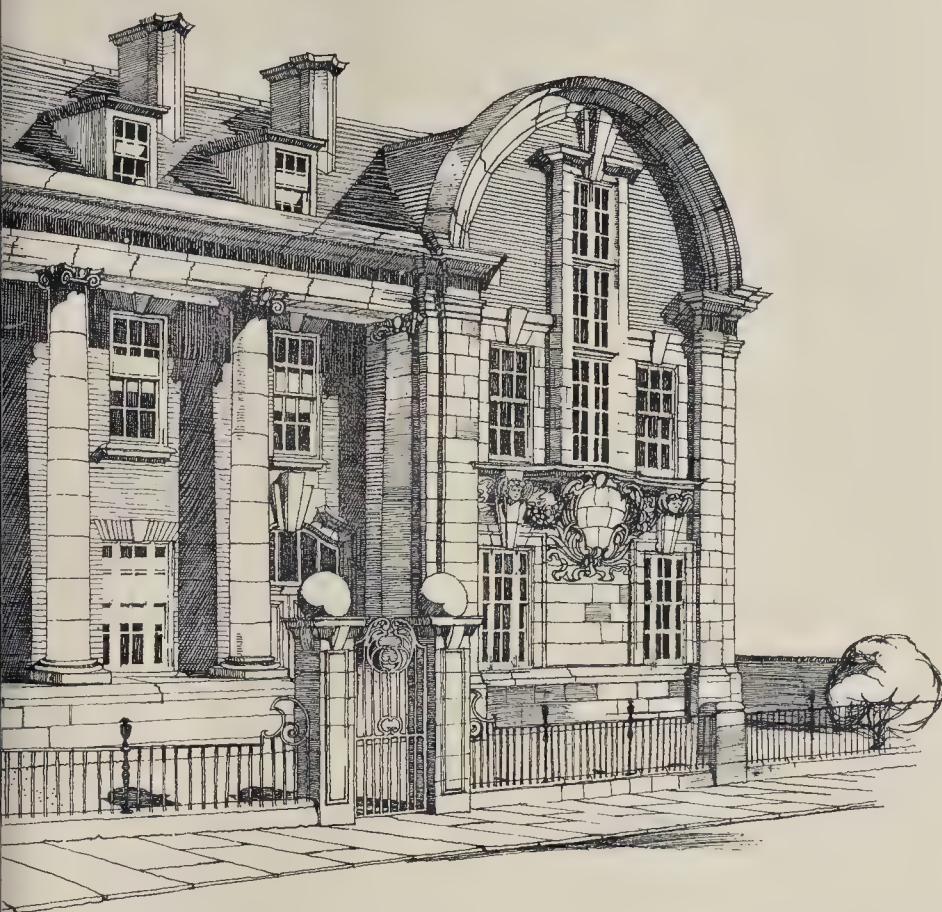


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SCALE OF FEET FOR SECTIONS



GROUND FLOOR PLAN.



FIRST FLOOR PLAN.

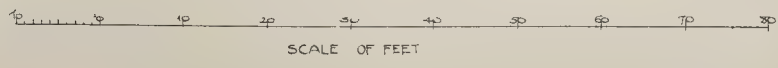
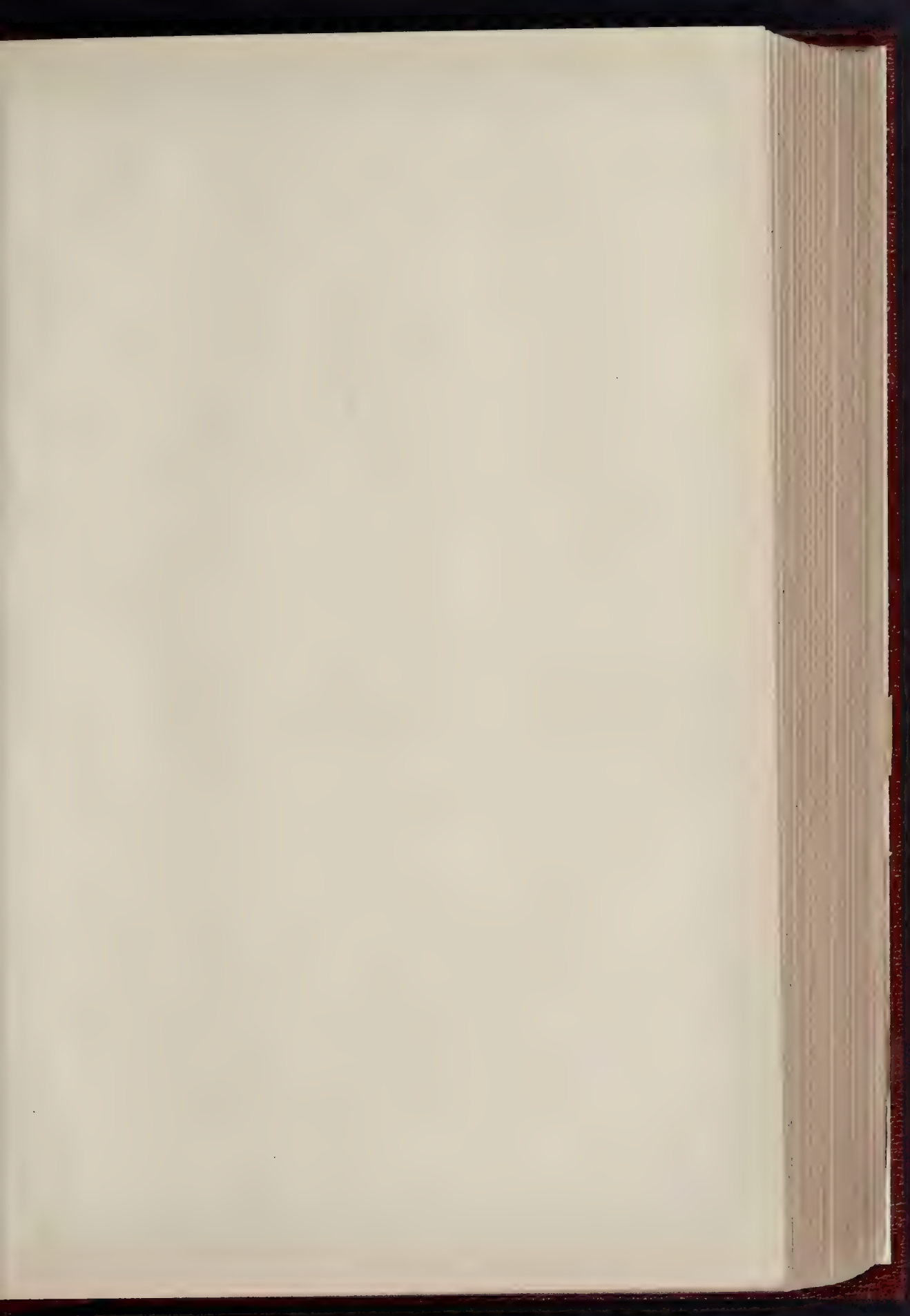
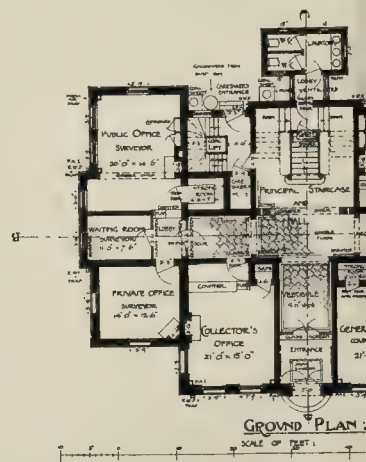
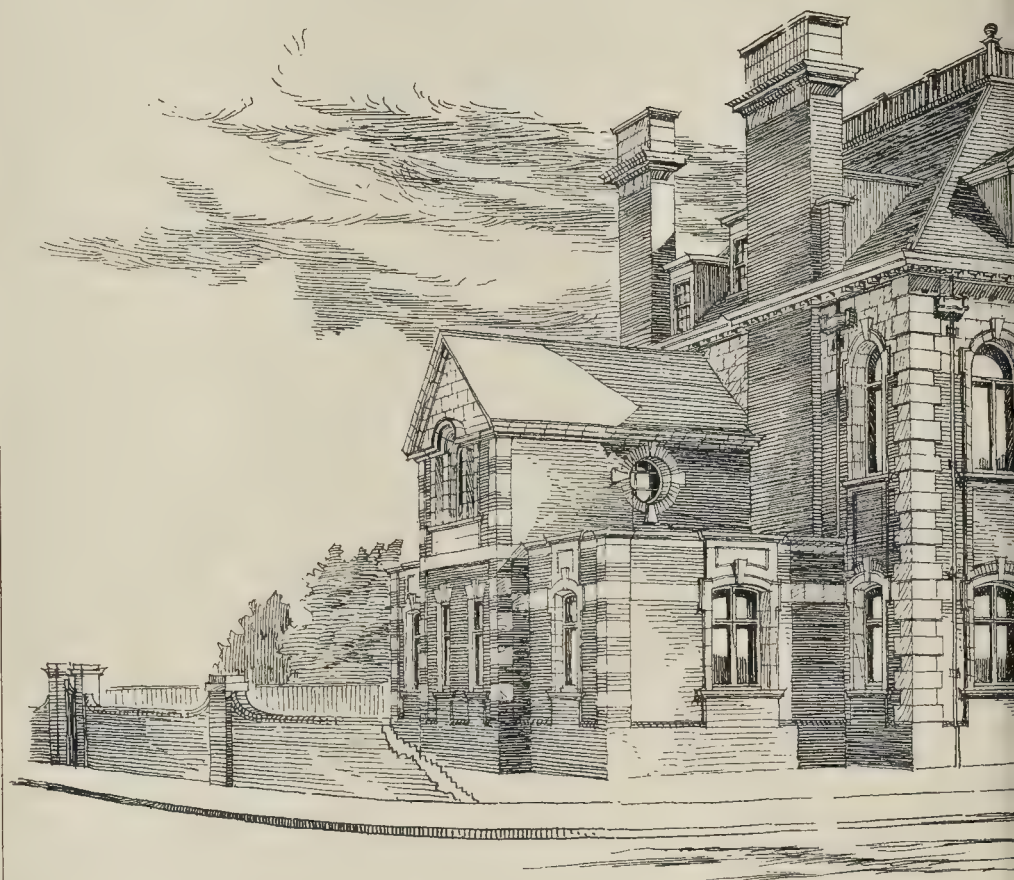


PHOTO-LITHO SPRAGUE & CO. 495, EAST HARDING STREET FETTER LANE, E.C.





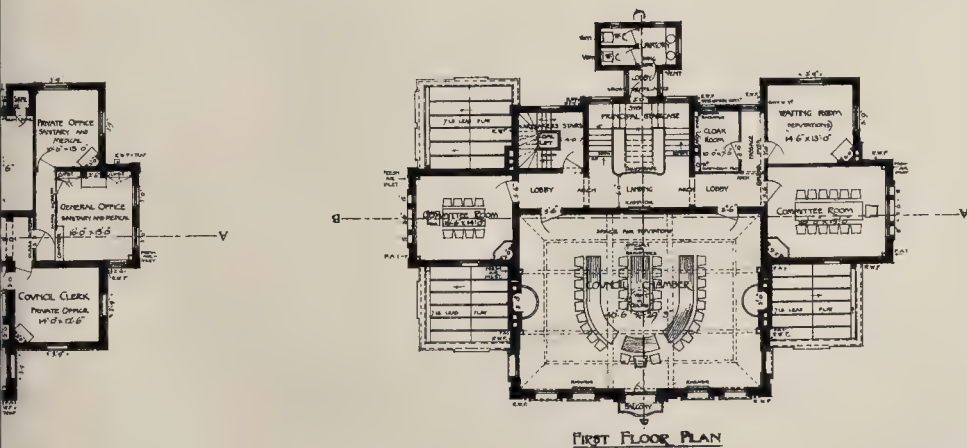
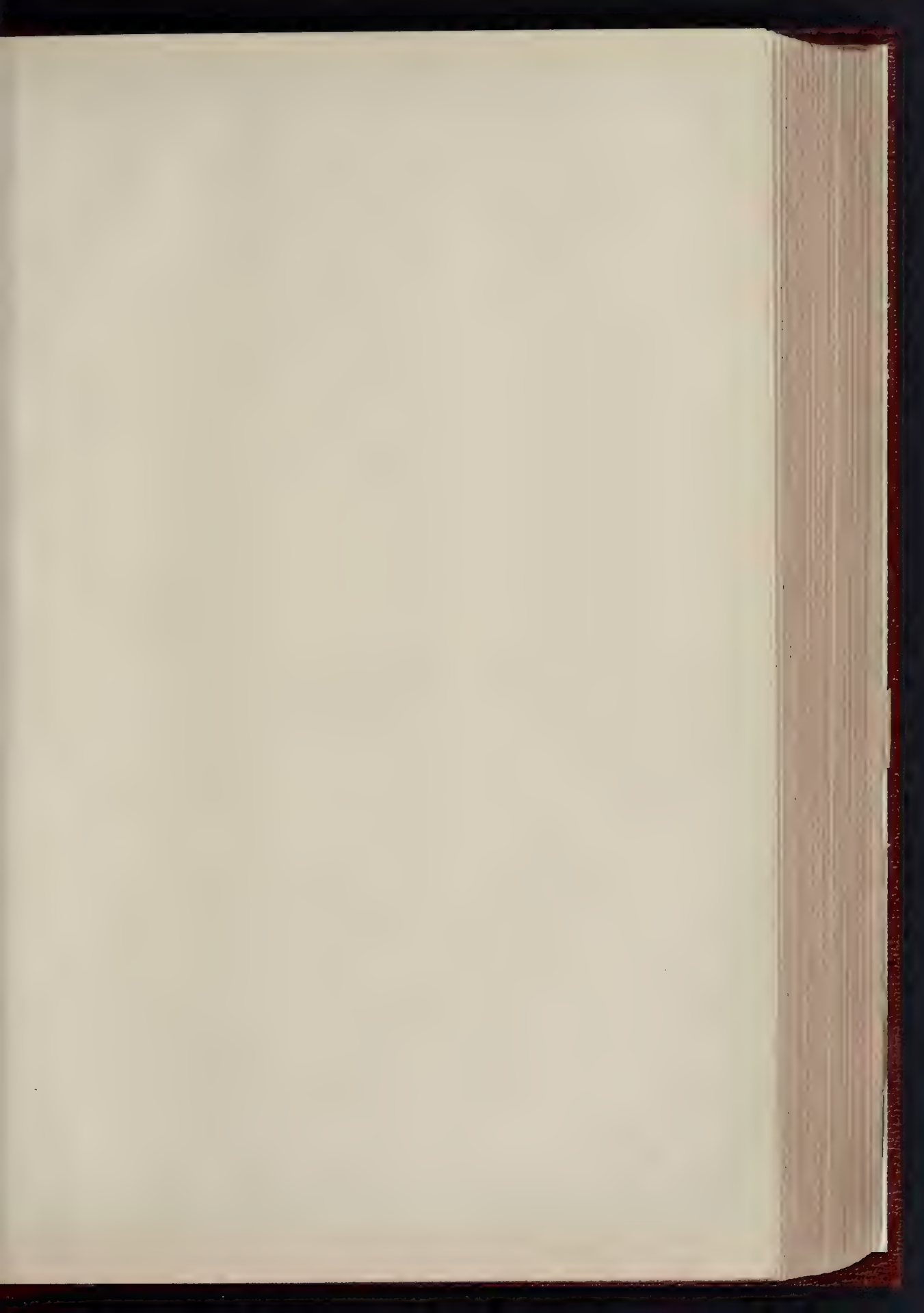
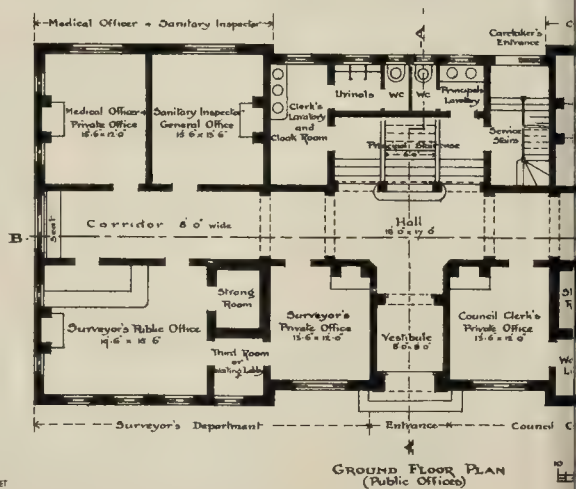
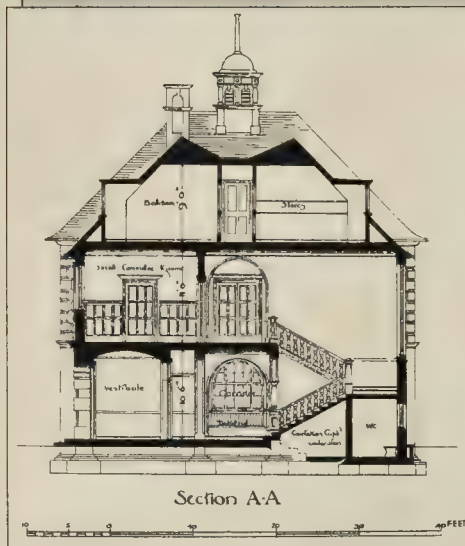


PHOTO-LITHO SPRAGUE & CO. 425, EAST HARDING STREET, FETTER LANE E.C.





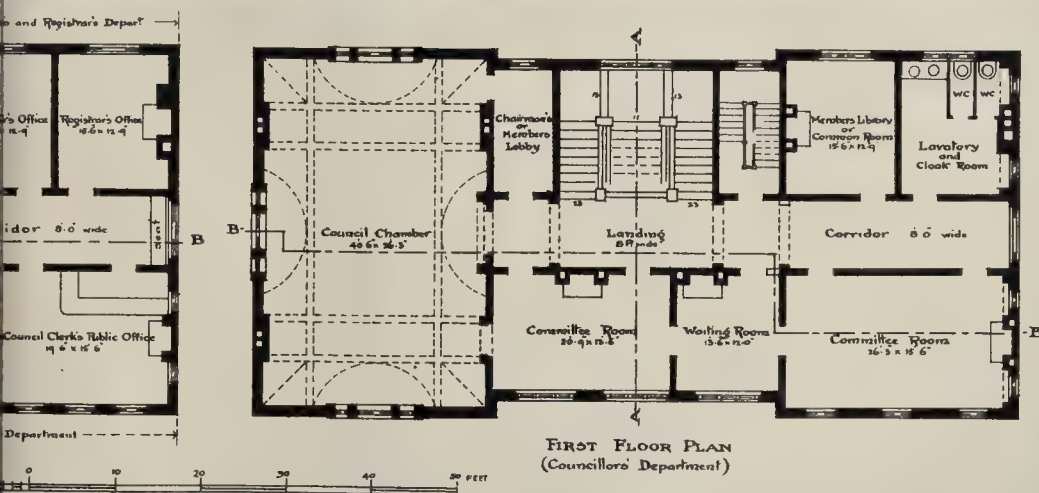


PHOTO LITHO SPRAGUE & CO. 695 EAST HADING STREET FETTER LANE, E.C.

(9) "By Lamplight;" (10) Emce; (11) Doan Tu Nomi; (12) Slavekircke. The Council have awarded the Medal and ten guineas to the author of the design bearing the motto "Slavekircke" (Mr. Harbottle Reed), and a Medal of Merit to the author of the design bearing the motto "By Lamplight" (by Mr. W. Stanley Bates).

The Aldwinckle (extra) Studentship (50l.).—The Council having decided to award the Studentship for the year 1898 to the person who, among all those submitting works for the prizes and studentships 1897-98, will, in their opinion, best carry out the donor's intentions, have selected Mr. James B. Fulton.

The Ashtel Prize.—The Council have, on the recommendation of the Board of Examiners (Architecture), decided not to award the Ashtel Prize for 1897.

The Arthur Cates Prizes.—Prizes of books to the value of ten guineas, offered by Mr. Arthur Cates, ex-Chairman of the Board of Examiners, to the students whose Testimonies of Study for admission to the Final Examination are considered by the Board to best merit the prize, provided they pass the Examinations for which the said Testimonies are submitted, have, on the recommendation of the Board of Examiners (Architecture), been awarded to Mr. Percy Morris (London) for the June Examination, and to Mr. Laurence Hobson (Liscard, Cheshire) for the November Examination.

Travelling Students' Works, 1896 and 1897.

The Pugin Student, 1896.—The Council have approved the work executed by Mr. Cecil Claude Brewer, who was elected the Pugin Student of 1896, and who travelled in the counties of Essex and Suffolk.

The Soane Medallist, 1897.—The Council have approved the work executed by Mr. John Alexander Russel Inglis, who was awarded the Soane Medallion in 1897, and who travelled in Italy and Sicily.

The Godwin Bursar, 1897.—The Council have approved the report of Mr. Robert Stephen Ayling, who was awarded the Godwin Bursary in 1897. Mr. Ayling visited Paris for the purpose of reporting upon the Abattoirs and Cattle Markets there.

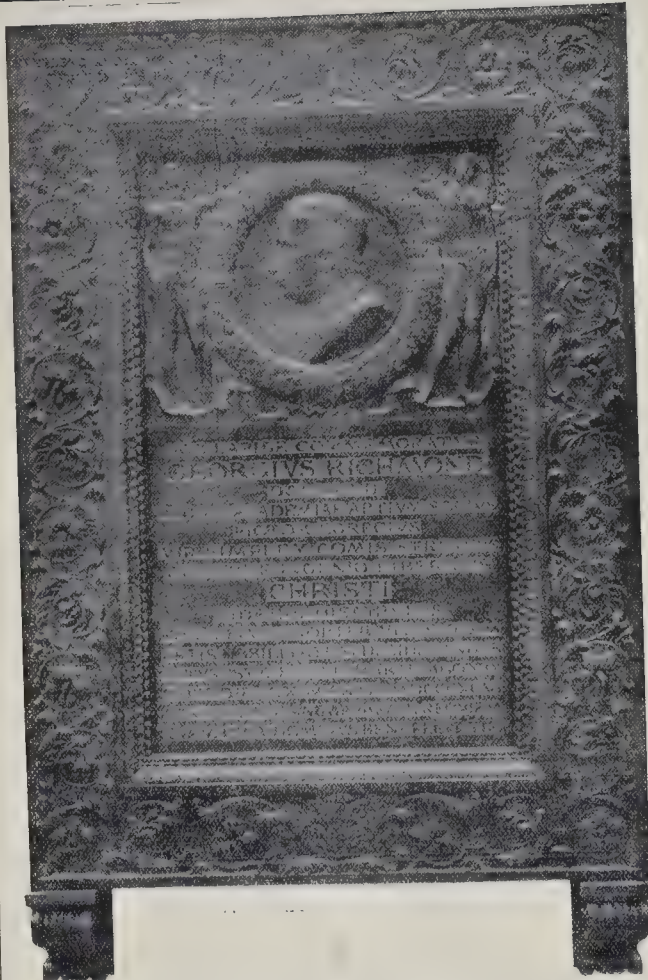
The Pugin Student, 1897.—The Council have approved the work executed by Mr. William Haywood, who was elected the Pugin Student of 1897, and who travelled in the counties of Hampshire, Somersetshire, and Wiltshire.

The Owen Jones Student, 1897.—The Council have approved the report and drawings executed by Mr. A. E. Henderson, who was awarded the Owen Jones Studentship in 1897, and who travelled in Greece and Turkey.

The Aldwinckle Students 1896 and 1897.—The Council have approved the reports and drawings executed by Mr. H. S. East, who was awarded the Aldwinckle Studentship for 1896, and Mr. A. T. Griffith, who was awarded the Aldwinckle Studentship for 1897. Both gentlemen travelled in Spain for a period of not less than eight weeks.

The exhibition of drawings at the Institute submitted for the prizes and studentships, and of the works of students and others, will close on the 24th inst.

The sixth general meeting (ordinary) of the session will be held on Monday, the 24th inst., when an address to students will be delivered by the President, and some critical observations made by Mr. Ernest George on the works submitted for the prizes and studentships. At the conclusion of the address the presentation of prizes will be made by the President.



Memorial Tablet to the late George Richmond, R.A., St. Paul's Cathedral.

MEMORIAL TABLET TO THE LATE GEO. RICHMOND.

The tablet here illustrated was placed a few weeks ago in the crypt of St. Paul's Cathedral by the sons and daughters of the deceased painter.

The bronze medallion with the wreath and supporting figures, were modelled by Sir W. Richmond; the tablet of rosso antico marble, with its ornamental border, was adapted by Mr. John Richmond from an ancient altar figured in Tatham's work on classical ornament. (Tatham, who was an architect, was Geo. Richmond's father-in-law.) The inscription, which was written by Mr. Justice Kennedy, is as follows:—

HOC LAPIDE COMMEMORATUR
GEORGIUS RICHMOND
B.C.L. I.L.D.
REGIAE ACADEMIAE ARTIUM SOCIUS
PICTOR EGREGIVS
VIR SIMPLEX COMIS STRENUUS
RE ATQUE INGENIO LIBERALIS
CHRISTI
FIDELIS DISCIPULUS
NON MINUS PROPTER NOBILITATEM VITAE
QUAM ARTIS DESIDERANDUS
NATVS EST DIE XXVIII MARTII MDCCCXII
OBIT DIE XIX MARTII MDCCCXCVI
CONVERTERE ANIMA MEA AD REQUIEM TUAM
QUIA DOMINVS BENEFECIT TIBI.

The marble was carved in the workshops of Messrs. Farmer & Brindley, and the bronze casting was executed, by the *cire perdue* method, by Messrs. Singer & Sons, of Frome.

COMPETITIONS.

SCHOOL AT DENTON HOLME, CARLISLE.—Forty-five sets of plans were submitted in the recent competition for schools at Denton Holme, for the Carlisle School Board. Mr. E. R. Robson, of London, was the assessor, and the premiums were 20l. and 10l. The following is the order in which some of the designs have been placed:—1. "Red Circle," Mr. W. Rushworth, Croydon; 2. "99," Mr. J. M. Bottomley, Middlesbrough; 3. "Strength and Grace," Mr. H. P. Burke-Downing, Westminster; 4. "Holme," Mr. Stephen Piper, Newcastle-on-Tyne; 5. "Light and Air," Messrs. Hunter, Crawford, & Carfrae, Edinburgh; 6. "Knowledge," Mr. W. Y. Hobbiss, Southend-on-Sea; 7. "Plan," Mr. S. Jackson, Fenchurch-street, London.

SCHOOLS, WESTBURY-ON-TRYM.—Mr. Edward Gabriel (Edmeston & Gabriel), the assessor appointed by the committee of the Westbury-on-trym National Schools, Gloucestershire, in connexion with the recent limited competition for new schools, has placed the design submitted by Mr. W. L. Bernard first, and that of Mr. H. Hirst second in order of merit, and the selection has been confirmed by the committee.

SEWERAGE SCHEME, MORECAMBE.—At a special meeting of the Morecambe District Council on the 11th inst. the twelve competitive schemes for the sewerage of the district were again considered, and eventually one submitted by "Forward" was adopted. This scheme will serve for a population of 60,000.

RECONSTRUCTION OF BANK PREMISES, ABERDEEN.—The interior of the head office, Castle-street, Aberdeen, of the North of Scotland Banking Company, has for some time been in course of reconstruction, and the operations—consisting principally of the enlargement of the telling office—are now all but completed. The frieze in the telling-office is 8 ft. 6 in. high, and is composed of castings of the frieze of the Parthenon at Athens from the Elgin Marbles at the British Museum, reproduced by Mr. Scott Morton, London. This frieze is of bronze upon a gold ground. The various contractors were:—Mason, G. Duguid, Aberdeen; carpenter, M'Robbie & Milne, Aberdeen; plasterer and marble work, James Bannochie & Sons, Aberdeen; painter, G. Donald & Sons, Aberdeen; granite work, A. Macdonald & Co., Ltd., Aberdeen and London; Chatwood safes, fitted by D. McHardy & Son, Aberdeen. Mr. A. Marshall Mackenzie, Aberdeen, is the architect, and Mr. Murray is the clerk of works.

The estimated cost of the works is 39,227. 10s. 0d. (exclusive of way leaves, engineering, or land), with an estimated annual working expenditure of 620l. 2s. 6d., for a population of 45,000. To this must be added the cost of the septic system, which has been agreed to, and which will form a part of the scheme. The successful competitor is Mr. H. B. Nichol, C.E., of Birmingham. The cost of the schemes submitted varied from 19,000l. to 66,000l.—*Bradford Observer.*

NEW WORKHOUSE AND OFFICES FOR THE FYLDE UNION, KIRKHAM.—Sixteen sets of plans have been received in this competition, and the Guardians have appointed a Fellow of the Institute of Architects as assessor.

CONTINENTAL OPINIONS REGARDING THE CRIPPLEGATE FIRE.

We have had occasion to refer to an investigation of the Cripple-gate fire, which was undertaken by the Hamburg authorities, but we avoided giving particulars of their report until after the inquest which was being held at the Guildhall. It may now, however, be of some use to know what the foreign expert thinks of our methods of fire protection, especially since we have recognised the fact that, instead of being up-to-date, we are many years behind many of the American and Continental cities.

The Hamburg Commission, which comprised a representative of their Board of Works, a leading insurance official, and the well-known Chief of their Fire Department, seem to have gone into the question very thoroughly, and in many ways appear to have had greater facilities than were given even to the jury at the City inquest. They were not hampered by formalities; there was no arranging of evidence, but a quiet and businesslike inquiry, and all three Commissioners had the advantage of being experts, whilst two of them should be termed authorities on questions of fire hazard.

These gentlemen seem to have come to the conclusion that we are in a very bad way indeed, and to put it plainly, are even behind the small provincial towns of northern Europe, not to speak of such cities as Vienna, Hamburg, Bremen, &c. But, of course, these experts do not judge us by the physique of our firemen, the brightness of our engines, our horseflesh, or even Mr. Blashill's excellent fire stations. They take fire protection as a whole, and actual fire brigade work (that is to say, the extinguishing of a fire) takes a secondary position with them compared with the preventive measures and the research work on which so much stress is laid abroad. To a very great extent, the modern fire brigade official of a large Continental centre is intimately associated with the work of the Building Act department, and with such public control or municipal insurance departments as are directly interested in minimising fire risks. The chief duty of the modern fire brigade officer is to prevent a fire occurring, and not to wait for the outbreak. The second duty is to see that everything possible is done to prevent its spreading, as far as building construction and planning are concerned. The third duty is to see that, if an outbreak should occur, the fire engines are called at the very earliest moment. When all these duties have been dealt with, comes the question of actual fire extinguishing. Fire protection is treated as a science, and the officer of a fire brigade is looked upon as a member of a technical profession. Preferably he should be an architect, surveyor, or civil engineer.

But to summarise the Hamburg report, which will be better appreciated after these preliminary remarks as to the view taken by our Continental critics, we would only say that our disregard for safe construction is ridiculed, that the absence of interest in fire prevention, so obvious in the fire brigade, is scoffed at as being out of date; and, finally, our fire brigade is pulled to pieces, with the one exception of its personnel, for which the Commissioners certainly have great admiration.

We have not space to enter into detail regarding their remarks on our methods of construction, or an explanation of the reasons why these critics think our fire brigade officers cannot give attention to fire prevention. We would only here speak of a few remarks regarding the methods of the fire brigade, which should be read together with the suggestions made by the Guildhall jury and referred

to in our last issue. Our Hamburg critics tell us that, quite independent of the fact of London being undermanned as it is, no less than 200 men of the small force at our disposal were lying idle at their stations during the Cripple-gate fire, and that nobody, apparently, thought of sending for them, though they were badly wanted on the spot, and there were plenty of horses standing by which could have been used for bringing them up. Then we are told that our firemen were badly handled at Cripple-gate, or, rather, not handled at all, it being the custom of each small group of men to do practically what they liked. According to the Hamburg critics, there was no central control worthy of the name. There were no tactics; and much else that did not bear the light of careful investigation.

As we remarked last week, there was an opportunity at the Guildhall inquiry to either disprove the charges if they were not true, or at least to show that every effort would be made to remedy the defects mentioned. We repeat the criticisms for what they are worth. They are given by officials of high standing and extensive experience, and in an official capacity. It is unpleasant to hear from abroad that leading authorities are clearly of the opinion that the Cripple-gate fire need not have been as extensive, and could have been cut off either at Jewin-street or Jewin-crescent, if we had been in the possession of a satisfactory organisation, and if our men had been well handled. This question of an efficient fire brigade has become one of vital importance, since our risks are constantly increasing, and the efforts which are being made for the adoption of preventive measures must naturally take many years before they have any perceptible effect. Even when we have a better built city than we have at present, a good fire brigade will be essential, though of course it need not be as strong then. As London stands to-day, any of the faults of which our Hamburg critics tell us may easily bring about the recurrence of a great fire like that of 1666. Given such unfortunate circumstances as a strong gale of wind or two important outbreaks commencing at the same time, we must have a catastrophe. Hence the sooner we reform our brigade and take up fire-prevention seriously, the better for the Metropolis.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The sixth meeting of the present session was held at 56, Great Marlborough-street, on the 12th inst., Mr. Matthew Garbutt, Chairman of the Section, occupying the chair. The paper of the evening was entitled "The Symbolism of Ecclesiastical Architecture," by Mr. Alfred Hale, A.R.I.B.A., of Birmingham. After some introductory remarks on the large part symbolism had played from the earliest days of Christianity in determining the forms and details of churches, Mr. Hale proceeded to describe the symbolic meaning attaching to the various parts of an ecclesiastical edifice. He quoted Eusebius, Candidus, and Socrates to show the early use of symbolism in the forms of churches. In this country the Norman style might be said to symbolise facts, the Early English doctrines. The saying that Christ ascended into heaven towards the east, "and shall come again in like manner," explains the orientation of churches, the congregation looking towards the east. The doctrine of the Holy Trinity was symbolised by many triple divisions of parts—by three towers, by three steps to the altar, three-light windows, arch mouldings consisting of three distinct groups, &c. The Atonement was symbolised by the cruciform plan (the curious deviation from the straight line being supposed to represent the inclination of Christ's head upon the Cross); regeneration by the shape and ornament of fonts, and their position in the church; the separation of the Church Triumphant from the Church Militant by the chancel arch, which in early days was made narrow to signify the straightness of the entrance to the Kingdom of Heaven. Similarly minor doctrines of the Church, the sayings and miracles of Christ, the Divine Attributes, the martyrdom of the saints, &c., were represented by the disposition of mouldings, the shape and ornamentation of doors and windows, and by various decorative forms. In the use of colour and precious stones, while silver expressed purity and joy; deep red, the Passion; green, hope; violet, sorrow; blue, heaven; black, death; and so on. Mr. Hale made copious

references to buildings in which examples may be seen of the forms he described, and exhibited a fine collection of diagrams illustrative of architectural symbolism, which had been kindly lent by Mr. Doubleday, of Birmingham. The next meeting will be held on the 26th inst., when Mr. E. Herbert will read a paper entitled "Architectural Commission, Who Receives it?"

THE ARCHITECTURAL ASSOCIATION OF IRELAND.—A general meeting of this Association was held in the Grosvenor Hotel, Dublin, last week. The President delivered a most interesting lecture on the artistic treatment of architectural perspective. He illustrated his remarks by reference to original drawings by Messrs. T. Raffles Davison, C. W. English, and others, lent by various architects. The lecturer also showed some etchings, pointing out the error into which many draftsman fell—that of imitating the methods of the etcher. He also laid stress on the almost invariable neglect of "tone" in architectural drawings, whereby much work otherwise of considerable merit was spoiled.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—On Tuesday, the 11th inst., Mr. J. Kennedy Hunter, of Ayr, read a paper on "Some Points in Practice," the President, Mr. Wm. Tait Conner, occupying the chair. The lecturer spoke of the relations of the architect to the client, the contractor, and to his fellow architects. He favoured a fixed fee rather than a percentage; thought an architect had no option but to grant a certificate to a contractor for work done, less the usual percentage; objected to architects' guarantees in competitions, preferring an estimate by a skilled measurer, and concluded by cautioning the members against accepting responsibility for the clerk of works, who was the client's servant. Mr. W. J. Anderson opened the discussion, and said he hardly knew whether the client who did or who did not employ one was most troublesome. Mr. W. F. McGibbon agreed that good architects deserved the standard percentage, but thought the fact that some got half or a quarter of that was scandalous. Mr. John Fairweather did not object to lump sum fees if they were large enough.

ELECTRO-CHEMICAL INDUSTRIES.

MR. J. W. SWAN, F.R.S., was particularly happy in the choice of a subject for his presidential address to the Institution of Electrical Engineers. The rise and progress of electro-chemical industries have been so rapid that few people are aware of the large and profitable industries dependent on electrolysis and the use of the electric furnace which have sprung up during the last six or seven years. Although an immense amount of work has already been done in this field, yet so fertile has it proved that we heartily endorse the advice of Mr. Swan to young electricians that they should specialise in electro-chemistry. It is, nowadays, a profession in itself, and many of the appliances used were unheard of ten years ago.

One-third of the pure copper used in the world is produced electrolytically, and, considering the immense quantities used for electric lighting and traction purposes, this is to be measured in hundreds of tons per diem. One company alone, the Anaconda Copper Company, produces on an average over 100 tons of refined copper per diem, and has a plant capacity of nearly double this. Twelve years ago the price of aluminium was 2l. 10s. per lb., now it can be got for 1s. 3d. The great reduction of price is due entirely to the development of the electrical methods of obtaining it. The cost of aluminium and copper are now, bulk for bulk, the same, and it seems probable that aluminium will very soon stand next to iron in its usefulness and price.

Perhaps the most important of all the applications of electro-chemistry at the present time is the manufacture of alkali, several electrolytic methods being employed for the production of caustic alkali, and chlorine. Mr. Swan mentioned specially three methods which are extensively employed, namely, the Har-greaves-Bird, the Castner-Kellner, and the Richardson and Holland processes, but it is too early yet to state which is the most profitable. A thousand horse-power plant was started four months ago in this country to work the Castner-Kellner method, and two others, one of 2,000 horse-power, and the other of 1,000 horse-power, are in course of erection, and are expected to be in working order in July. On

Continent three large works are in operation, and the American Mathieson Company, at Niagara Falls, have just commenced manufacturing bleach and alkalis on an enormous scale. It must also be remembered that many electrolytic patents will soon expire, and that when royalties cease to be paid we may expect still further reductions in price.

The electrical methods of producing potassium and sodium by electrolysis of the fused hydrate have been perfected by Castner, and are now successfully employed. The market for these metals is, of course, small, but it is now wholly supplied by the electrolytic companies.

The recovery of gold from the gold-bearing ores or amalgamator tailings is now being done on a large scale by means of the Siemens-Halske process. Formerly gold was extracted from its ores on a small scale by the amalgamation or chlorination process; now by the electrical process tailings are treated in tanks having a capacity of two hundred tons, and the slimes in vats capable of holding one thousand tons. The difficulties to be overcome were very great, and that the cost of the process is only about a third that of the chemical precipitation process shows how successfully they have been overcome. The solution, which circulates through the vats at the rate of a thousand gallons per hour, contains only a few pennyweights of gold per gallon when it enters the first tank, and only a few grains when it leaves the last one. The extraction efficiency of the plant of the Rand Central Reduction Company is 70 per cent, and it treats three thousand tons of tailings by this method a month.

The Cowper-Coles method of electro-plating with zinc (true galvanising) is worked by several firms in this country, and is of special importance in the construction of boiler tubes. In Switzerland and Sweden where water power is cheap, chlorate of potash is manufactured electrolytically, and this method will soon supersede the chemical method.

In addition to the electrolytic industries there are several electro-thermic industries depending on the great heat which can be developed in the electric furnace, and the ease with which the heat can be regulated. The manufactures of carborundum, carbides especially calcium carbide, and graphitic carbon blocks for anodes are a few of the industries depending on the electric furnace.

Alternating current has been employed by Mr. Andreoli for the production of ozone on a commercial scale. Its cost of production is about 40¢ per ton. At present the applications of ozone are limited, but it is highly probable that it will be used largely in the future. It is used for bleaching varnishes and oils, for starch purification, and in conjunction with chlorine for bleaching textile goods. Experiments are being carried out on its use for purifying vitiated air and for sterilising fluids.

Mr. Swan made some interesting remarks as to how far the availability of water supply as a cheap source of power would affect the location of electro-chemical works, and gave the following table showing how many electrical horse-power hours were consumed in the production of 1 lb. of the following substances:—aluminium, 14; nickel, 1; sodium, 33; caustic soda + 2 lbs. bleaching powder, 27; chlorate of potash, 5; zinc extraction, 1; copper, 0.5; copper refining, 0.25. It follows that factories for aluminium and for electro-thermic products, as carborundum, carbides, &c., will be situated where water power is cheap. When, however, the cost of power is not relatively so important as in copper refining, alkali manufacture, &c., then the works will probably be located where coal is fairly cheap. In Lancashire several factories use steam power for the production of caustic soda and bleaching powder, and they easily compete with factories situated where water power is cheap.

In our opinion, Mr. Swan took too gloomy a view of the prospect of the direct conversion of heat into electric energy. He was right, however, in pointing out that the dynamo had little to fear from its rivals at present. Until a radical change has been made in the construction of all primary batteries they will never be employed on a large scale. The trouble of renewing the anodes and electrolytes fatally handicaps them.

We must warn the young electrician that unless he has a thorough knowledge of chemistry his chances of success are small. A good chemist, even if he has very little electrical knowledge, has better prospects in this field.

During the last year several good books on electro-chemistry have been published, but they seem very little known. It is a matter of congratulation that although teachers in our technical schools are badly paid and their laboratories, if they are fortunate enough to have any, poorly equipped, yet so many of them keep abreast of the tide of scientific progress. Manufacturers also are now thoroughly alive to the value of electrolytic methods, and inventors have little trouble in getting them to give their methods a trial.

BOOKS RECEIVED.

SOILS AND SUBSOILS. By Horace B. Wood. (Memoirs of the Geological Survey.)

WHAT IS FIRE PROTECTION? By Edwin O. Sachs. SOME AMERICAN OPINIONS ON FIRE PREVENTION. THE PARIS CHARTER EAZAR FIRE. By Edwin O. Sachs. (British Fire Prevention Committee.)

NINTH REPORT ON TRADE UNIONS, 1896. By the Chief Labour Correspondent of the Board of Trade.

Correspondence.

To the Editor of THE BUILDER.

THE INQUEST ON THE CRIPPLEGATE FIRE.

SIR,—Referring to the important leading article on the Cripple-gate fire inquest in your issue of 15th inst., allow me to suggest that the gentlemen who asserted at the inquest that the buildings destroyed by this fire were constructed in accordance with the regulations of the Building Act in force at the time of their erection, should name their authority for such assertions.

This is certainly desirable in view of Section 19 of the 1855 Act, which restricts the slope of a roof for a warehouse or other building used wholly or in part for the purposes of trade or manufacture to an angle of 47 deg., and also in view of Section 13, which states that, for all buildings, the area, taken together, of recesses and openings in external walls, shall not exceed one-half the whole area of the wall in which they are made.

There was evidently no doubt in the minds of the jury that the buildings destroyed were included in the foregoing or "Warehouse Class," otherwise their recommendation that match lining for walls and ceilings in such buildings should be forbidden would be nonsense.

Most of the warehouses destroyed were covered with "Mansard roofs," many of which had an inclination of about 80 deg., instead of 47 deg., and the openings in many of the external walls, especially those round open light areas, greatly exceeded half the area of the wall in which they were made.

These evasions of the clear meaning and intention of the Building Act are mainly responsible for the alarming spread of the fire.

In this connexion it may be well to draw attention to the case of the Great Tooley-street fire in 1861, with regard to which the District Surveyor stated, before the Parliamentary Select Committee on Fire Protection, on July 4, 1869, in reply to question 6367, that he had objected to the erection of a building exceeding 50,000 cubic feet (which huge building was mainly responsible for the spread of that fire), and brought the case before a magistrate, who decided that a so-called fireproof floor supported on bare iron girders and columns was a party wall.

If this evasive decision had been properly challenged at the time, instead of being left until 1892, after which date it was set aside by the Court of Queen's Bench, this large warehouse would have been divided by party walls and the area of the Tooley-street fire in all probability greatly restricted, and the subsequent erection of many dangerous buildings would have been prevented.

A disastrous conflagration, after repeated warnings, now occurs in consequence of evasions of the provisions of the Building Act, with regard to warehouses, roofs and the extent of window openings.

This part of the subject urgently calls for the immediate consideration of the Building Act Committee of the County Council, who, with their predecessors, appear to be more responsible for the extent of this conflagration than the Fire Brigade Committee.

CURFEW.

COLOUR THEORIES AND DECORATION.

SIR,—I am afraid that, in endeavouring to be brief in a former letter, I failed to make clear why I do not think Chevreul's book one to assist the practical student of decoration, but rather to embarrass and mislead him.

In the first place, Mr. Chevreul was a scientist—a very thoughtful and observing one, with a careful eye for phenomena, so far as they can be produced by experiment in the laboratory or lecture hall; but he was lacking in the artistic qualities which give

an insight into the true bearings of his phenomena when applied to objects of daily life "in the round," affected as these are by light and shade, reflected light, and other bye-conditions. Consequently, though his *experimental* deductions are, as a rule, very correct, his further or external application of them is often partially or wholly incorrect; and a student has not experience or training enough to know where he is wrong.

Then, it can hardly be treated as a matter of indifference that Mr. Chevreul was not aware that the so-called "primaries" of the spectrum are not identical with those of the palette—that blue and yellow, when combined by optical means, make grey or white, *not* green, as they do when the pigments are combined on the palette.

Chevreul wrote his book, I find, in 1835. It is only requisite to consider what was the state of art and the taste in colour in France at that date to realise that the artistic influences to which Mr. Chevreul was open at the time of his experiments were not such as to exercise a very valuable control on his deductions, and taste was certainly at a very low ebb at the Gobelins factory.

Chevreul did a great work by his book, and opened a very valuable path of study. It should be no reproach to him that he has led many a colourist into crude combinations and artistic blunders. Further research has enabled others to supply the needed qualifications of his results; and it is, therefore, not wise to set before beginners a voluminous and elaborate work requiring the closest attention, when all that is most valuable can be found, in more accurate form, in more modern hand-books. J. D. CRACE.

HARD CEMENT ON WALLS.

SIR,—Mr. L. A. Shuffrey's letter in your last issue does not quite reply to the queries of "H. W."

I fully agree with your other correspondent that efflorescence on hard cements is usually due to Port-land cement having been used in the brickwork in the rendering. Sometimes, however, the bricks themselves effloresce, and this efflorescence passes through the hard cement, evaporating and leaving a powder on the surface.

The hard cement usually gets the blame, however, and very unjustly so.

There is little difference in behaviour with regard to the above, whether Parian, Keene's, or Martin's cement be used.

With lime mortar, and a rendering of the particular hard cement and sand, there is no fear of efflorescence, unless it should come from the bricks themselves.

If the wall (however built) and plastering are allowed to become thoroughly dry before painting, the evil will be certainly avoided, whatever it may arise from.

It is quite safe to plaster ~~on~~ on both sides with hard cement, as the moisture passes through the latter, either perceptibly or imperceptibly, and this would hold good, whether the wall were built in lime mortar or otherwise. W. J. K.

"ST. CHAD'S CHAPEL," LICHFIELD CATHEDRAL.

SIR,—One would like to know whereabouts in Lichfield Cathedral this old-new or new-old chapel, the "restoration" of which was chronicled in your last number, is; it does not appear to be shown even as a ruin in the plan of the cathedral included in your Cathedral series (*Builder*, February 7, 1891).

One would also like to know exactly how much of it is old and how much new. H. E. T.

* * * The chapel is over the Sacristy; this should certainly have been mentioned. For the rest, we gave pretty full details as to what was done in the restoration. We may add, however, that the wall-ribs as well as the springers are ancient, the remainder of the vaulting is new.—ED.

BATTERSEA BATHS COMPETITION.

SIR,—The error, which Mr. A. Hessel Tiltman calls attention to, in the notice of the above competition, was caused, primarily, by the way in which the designs selected for exhibition were arranged and numbered (the figures 1, 2, and 3 having been added to the letters by which the several designs were originally distinguished), and was confirmed by the impression produced, after examination and comparison of these designs, that no other order of merit was possible; but that the third, instead of the second premium, should, after all, have been awarded to Mr. Tiltman's design, can only be regarded as one of those competition mysteries which pass all understanding.

THE WRITER OF THE ARTICLE.

STATUE OF BOADICEA.—The model of the statue by Mr. Thomas Thornycroft of Boadicea, the British Warrior Queen, was placed in position on the Thames Embankment, immediately facing the House of Commons, on the 15th inst., in order that the members of the London County Council might view it. The figure of Boadicea, which stands 18 ft. high, is represented in a chariot, supported on either side by female warriors.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—IV.

THE formula which we have investigated and used for calculating the strength of a timber beam assumes that the ends of a beam merely rest upon their supports. If one or both ends of the beam are rigidly fixed so as to be prevented from tilting on the edge of their support a very considerable increase of strength results, the amount of which has been determined by experiments and can be investigated analytically, but for this purpose the student's knowledge of mathematics must be very much greater than we have assumed, and indeed, more than can be expected from the majority of architects. If, however, we suppose as shown in the diagram



that a beam AB of uniform cross section is fixed at both ends and loaded at the centre, it does not require any advanced mathematics, but only ordinary perception, to see that the result would be the bending somewhat in the form shown in the diagram.

It is sufficiently near accuracy to take the strength of the beam fixed at one end and supported at the other as $\frac{1}{2}W$, where W is the strength of a similar beam under similar conditions, but supported only at both ends without being rigidly fixed. If the beam is rigidly fixed at both ends its strength is then $\frac{1}{2}W$. The student must, however, be cautioned that in actual practice, beams with fixed ends very rarely occur, and are indeed open to strong objections. If the beams are of timber, the rigid fixing and consequent confinement of the ends of the beam leads to their decay. If the beams are of iron, the rigid fixing prevents their free expansion and contraction. Practically, therefore, the only cases in which the ends of a beam may be supposed to be rigidly fixed are when the beam is continuous over one or more supports, and loaded with a distributed load.

It sometimes happens that it is desirable not only to find the strength of the given beam or the necessary scantling to obtain a certain amount of strength or do a certain amount of work, but it is necessary to make calculations on the deflection or bending of the beam or conversely of the necessary scantling of a beam to avoid deflection or bending. This, therefore, brings us to the question of deflection, for which a fairly simple formula will suffice.

The deflection of a beam depends upon its elasticity, and is also affected by the relation between the scantlings. It has been found by experiment that the deflection varies inversely as the cube of the length, and directly as the breadth and as the cube of the depth. The load upon a beam is also necessarily a determining factor of the amount of deflection. The deflection, however, does not precisely vary directly with the load, but as the load increases the deflection increases more and more rapidly. To estimate this with precision by means of a formula would demand more advanced mathematics than can be expected from a student, and in practice it is usual to assume that the deflection does vary directly with the load. This is very nearly true within the limits of the elasticity of the material. After the elastic limit is passed the deflection increases irregularly, and more rapidly than before. As the weight of the beam itself has considerable effect in producing deflection it is necessary to add five-eighths of the weight of the beam over the span to that of the actual load in order to rightly estimate the deflection. With these explanations we may now proceed to give a formula for rectangular beams:—

$$SD = \frac{WL^3C}{BD^3}$$

where SD is the deflection within the safe or elastic limit in inches, W is the total equivalent of the centre load in tons, L the span in feet, C is the constant, B the breadth in inches, and D the depth in inches.

The constants which may be used in this formula are:—For oak, 0.5; fir, 0.7; cast iron, 0.06; wrought iron, 0.04; steel, 0.03. All these constants vary somewhat with the quality of the material, particularly those relating to timber.

What we have said in the beginning of this chapter about the cases of beams fixed at one or both ends does not precisely hold good with deflection. The student will already have seen by comparison of the formula given above for deflection that this stands on a very different footing from that for the strength or breaking weight of a beam.

If the deflection of a beam supported at both ends, and loaded at the centre, be taken as unity (1), that of the same beam, with the same load uniformly distributed, will be $\frac{2}{3}$. If firmly fixed at both ends and uniformly loaded, $\frac{1}{4}$; if fixed at one end and loaded at the other, $\frac{1}{16}$; if fixed at one end and uniformly loaded, $\frac{1}{6}$. These last two cases are, of course, those of cantilevers, which are, and may be described as beams fixed at one end and loaded at the other.

The amount of deflection which may be allowed in structures is dictated by various considerations. First of all, we have the limit of elasticity of the material. The elasticity of material is, of course, that power which it has of resuming or returning to its original form after deflection; and the limit of elasticity is the measure of the amount of deflection which material can undergo without becoming permanently distorted. This, of course, varies with different materials; hence the variation in the constants which we have given above for different materials. When material is strained beyond its limit of elasticity it is so far deflected or distorted as to be unable to resume its original form; when this has occurred material is said to have received a permanent set, and is in a condition which indicates that it is prejudicially strained. The proportion of the breaking load which is sufficient to produce a permanent set varies with different materials. In the case of timber a load of one-fiftieth of the breaking load will, if continued for a few months, produce a permanent set. But for practical purposes the elasticity of a wooden beam is not materially injured if the quiescent load does not exceed about one-third of the breaking one. It has been assumed by Tredgold and others that in order that timber should not cause the plaster of ceilings to crack a beam should not be deflected at its centre more than $\frac{1}{250}$ th part of the span.

The question of elasticity and permanent set is closely connected with the property of material which we have already described as "fatigue of material." Whether the application of the stress be repeated and recurrent, or whether it be long continued, in either case under the stress the material loses something of its initial strength, or, as the term well implies, becomes fatigued. Within the limit of the elasticity of the material the number of repeated applications of the stress is enormous, say, about forty million times; but it may be said with truth that a repeated or continuous application of any stress, if carried on for a sufficient length of time, will break the material.

As a general rule, it may be taken that the limit of elasticity of any material is about one-third of its tensile strength. Another formula, which may be used for calculating the deflection of beams, and one which applies more accurately for various forms of beams, is:—

$$D = \frac{nwP}{EI}$$

where D is the deflection in inches, w the total equivalent load on the beam including the proportion of its own weight, l the length of the beam in inches, E the value of the modulus of elasticity of the material, I the moment of inertia about the neutral axis of that section of the beam where the greatest stress occurs with the given distribution of load; n is the co-efficient, the value of which is given for different classes of beams and different distribution of loads by Professor Rankine as under:

Beams of uniform cross section.

Fixed at one end, loaded at the other $\frac{1}{3}$
Fixed at one end, loaded uniformly $\frac{1}{8}$
Supported at both ends, loaded in the middle $\frac{1}{16}$
Supported at both ends, uniformly loaded... $\frac{1}{24}$

Beams of uniform strength and uniform depth.

Fixed at one end, loaded at the other $\frac{1}{3}$
Fixed at one end, loaded uniformly $\frac{1}{8}$
Supported at both ends, loaded in the middle $\frac{1}{16}$
Supported at both ends, loaded uniformly $\frac{1}{24}$

Beams of uniform strength and uniform breadth.

Fixed at one end, loaded at the other $\frac{1}{3}$
Fixed at one end, uniformly loaded $\frac{1}{8}$
Supported at both ends, loaded in the middle $\frac{1}{16}$
Supported at both ends, uniformly loaded 0.1427

OBITUARY.

MR. GEORGE KERRICK-WALKER.—The death of Mr. George Kerrick-Walker, architect, took place at Chester-le-street on the 10th inst. Deceased, who was attacked by paralysis some time since, died at the age of thirty years.

GENERAL BUILDING NEWS.

PRIVATE CHAPEL FOR THE DUKE OF FIFE.—A small private chapel is at present being built by the Duke of Fife at his residence, Mar Lodge, Braemar, Aberdeenshire. Mr. A. Marshall Mackenzie, Aberdeen, is architect, and Mr. Edgar Gauld, Aberdeen, has the contract for the masonry of the chapel, which will be of granite, both inside and outside.

MANCHESTER CATHEDRAL IMPROVEMENTS.—The Dean of Manchester has issued a circular with regard to the new west porch of this cathedral, in which he says that the deviation in the street line and footpath at the west end of the cathedral, agreed to between the Corporation of Manchester and the ecclesiastical parties concerned, has necessitated some rearrangement of the precincts in front of the tower and of the ascent into the church itself. The matter was for some time under very serious consideration by the Dean and the late churchwardens, in conference with Mr. Basil Champneys, architect, by whom a design was at length prepared. So deeply, however, did the authorities feel the responsibility of undertaking this work that they further called into consultation Mr. Bodley, who presented them with a report approving of Mr. Champneys' design. A committee was subsequently formed for the purpose of carrying out the design, and, tenders having been invited, a contract was entered into for a portion of the work now in progress. The object specially sought to be accomplished is the provision of a covered approach to the Cathedral, to be used on state occasions by ecclesiastical and civil dignitaries, the Lord Bishop of the diocese, Her Majesty's judges of assize, the Lord Mayor and Corporation of the city, or other public bodies. Abutting on Victoria-street, and commenced in the sixtieth year of Her Majesty's reign, these buildings are known as the "Victoria Porch," or Galilee, and a niche has been prepared for the reception of a statue of Her Majesty to which will be added, as funds accrue, figures of other notabilities in Church and State. The central portion only is as yet contracted for. The committee now appeal for funds, which they wish to raise immediately, that the wings on the north and south sides of the porch proper may be proceeded with whilst the appliances for building are on the site.

CONSECRATION OF ST. MICHAEL'S CHURCH CLAUGHTON.—The new church of St. Michael and All Angels, situated on the north side of Carlton-road, Cloughton, was consecrated recently by the Bishop of Chester, Dr. Jayne. The new church, when completed, will provide seating accommodation for 800 persons, but the portion now built consists only of the chancel, choir, transepts, and one bay of the nave arcade, and will seat 440 persons. The west wall will be removed when the remaining two bays of the nave and the west gable are built, and the nave will be 84 ft. in length by 33 ft. in width, and with a height of 46 ft. to the apex of the roof. The building was designed by the architects, Messrs. F. & G. Holme, Liverpool. The plan of the completed church comprises the nave with north and south aisles and transepts, the choir with smaller north and south transepts, the former containing the organ, the choir vestry, and the chancel. The contractor was Mr. W. Hall, Liverpool.

WESLEYAN CHAPEL, HIGH BROOMS, TUNBRIDGE WELLS.—A new chapel is about to be erected at High Brooms in connexion with the Tunbridge Wells Wesleyan Circuit. The new building will be 65 ft. long by 30 ft. wide, with seats for 200 people. The building has been designed by Mr. Herbert M. Caley, of Tunbridge Wells.

EPISCOPAL CHURCH OF FOLLA RULE, ABERDEEN.—The church of St. George, Folla Rule, Rothiemoran, after undergoing alteration and improvement, has been reconsecrated by the Bishop of Aberdeen, with the view of the alterations and improvements, including the new organ by Messrs. Wadsworth Brothers, Aberdeen and Manchester, has been between 1,300l. and 1,400l. The plans were prepared by Mr. Arthur Cyne, archi-

set, Aberdeen, and the work was carried out under his superintendence. The contractors for the various departments were as follows:—Mason work, Mr. Lauder, Inverurie; carpenter work, Mr. Watt, Inverurie; plaster work, Mr. Moir, Inverurie; plumber and slater works, Mr. Pirie, Fyvie; painter and glazier work, Messrs. Donald & Sons, Aberdeen; heating apparatus, Messrs. Rae & Sons, Inverurie.

PRIMITIVE METHODIST CHAPEL, BOSTON.—On the 13th inst. the Primitive Methodist Chapel, in West-street, Boston, which was destroyed by fire in January, 1897, and has been rebuilt and renovated at a cost of about 2,000l., was re-opened. Mr. W. Greenfield's contract for the brickwork, &c., was 1,500l., and that of Mr. Jessop, for the woodwork, 900l. Messrs. Hewitt, of Leicester, supplied the new organ at a cost of 250l. The architects were Messrs. Howdill, of Leeds.

CONGREGATIONAL CHURCH, QUEENBOROUGH, KENT.—A new Congregational church has just been opened at Queenborough. The architect was Mr. W. T. Rule, of Sheerness, and the contract was carried out by Mr. Joseph Eligh, builder and contractor. The church, which will seat 350 persons, is of brick. The extreme width of the building is 34 ft., with a length of 64 ft., the church, inside, being 51 ft. by 31 ft.

PRIMITIVE METHODIST CHURCH, AMPFIELD, HANTS.—A church, which has been erected by the Primitive Methodist body, was opened recently at Ampfield. The building is of brick, and was built by Mr. S. Collins, Awbridge, the architect being Mr. C. Harris, Boscombe.

SCHOOLS, DOVER.—The new elementary schools for Buckland parish, built in Barton Meadow by Mr. W. G. Lewis, from the plans of Messrs. Cresswell & Newman, were opened on the 7th inst., by Bishop Walsh. The building is constructed of yellow bricks, roofed with blue slates, with brown ornamented ridge tiles. There are seven rooms and two lobbies.

BOARD SCHOOLS, HUNTSPELL, NEAR BRISTOL.—New school buildings have been erected at West Huntspell, for the School Board for the combined parishes of East and West Huntspell and South Highbridge. The newly-erected schools have been built close to the main highway by Mr. H. W. Folland, of Bridgewater, from designs prepared by Mr. A. Basil Cottam, the Board's Architect, also of Bridgewater and Taunton.

BOARD SCHOOLS, ILESTON.—On the 10th inst. the new Gladstone-street Board Schools at Ileston were formally opened by the Mayor (Alderman S. Richards). The new schools have been designed on the central hall system, with separate class-rooms for each standard. There are two blocks, one for boys and girls and the other for infants. The total accommodation is for 900. Provision is made in each school for cloak-rooms and teachers' rooms. In the larger block the central hall, when the partition is removed, will be suitable for entertainments. A cookery school is also provided in a detached building. There are both covered and large open playgrounds for each school. The buildings are of red Leicestershire bricks, the roofs are covered with Broseley tiles, and the floors are of solid wood blocks laid upon concrete. The schools are heated by hot water. The approach to the girls' and infants' schools is from Gladstone-street, and that to the boys' school from Extension-street. The cost of erection exclusive of cost of site and furniture, is 9,045l. The architect is Mr. C. W. Hunt, the contractor Councillor W. E. Shaw, the plumber Mr. G. Andrew, and the clerk of the works Mr. Thomas Hallam, all of Ileston.

INFANTS' SCHOOL, BRAINTREE.—A new Infants' Schoolroom, Manor-street, for the Baintree School Board, was opened recently. The new building is situated on the west side of the playground which divides the old and the new schools, and comprises a room, 60 ft. by 24 ft., capable of accommodating 257 children, two class-rooms, two cloak lobbies, and various offices. The builder was Mr. E. West, of Chelmsford, and the architect, Mr. J. W. Clarke, of Coggeshall.

SCHOOL BOARD OFFICES, WEST HAM.—The new offices erected for the West Ham School Board in the Grove, Stratford, were opened on the 13th inst. The buildings have been erected from designs by Mr. W. Jacques, the Board's architect, by Messrs. W. Gregar & Son, of Stratford. The frontage of the buildings to the Grove is over 82 ft. and the offices, arranged on two floors, extend to a depth of 127 ft. On the upper floor the clerk to the board and his staff occupy the entire front, behind their rooms are committee and waiting rooms, and behind these again is the board-room—with public gallery—together with rooms for chairman and members. On the lower floor there are to the front, in addition to the main entrance hall and vestibules, the porter's lodge, the architect's office, and a room for committee meetings, whilst to the rear are other committee-rooms, with waiting-rooms and rooms for the visiting officers, &c. As this lower floor is raised above the level of the pavement outside, a basement, extending under the whole of the offices, has been obtained. The building is lighted throughout by electricity, and the plant which supplies the current also lights the principal corridors in mosaic, and throughout the building the floors, and the greater part of the roof,

are of steel and concrete. The building is of red Staffordshire bricks and Portland stone.

PROPOSED NEW SCHOOL BUILDINGS, LERWICK.—At the recent monthly meeting of Lerwick School Board, a report, with relative sketch plans was submitted by Mr. Wilson, Architect to the Edinburgh School Board, with reference to proposed enlargements of the present school accommodation in Lerwick. As requested by the Board, he submitted alternative plans. The meeting resolved to remit the plans to a committee for report.

NATIONAL SCHOOLS, LISSON GROVE.—New and enlarged National Schools in connexion with St. Paul's Church, Broadley-terrace, Lisson Grove, have just been dedicated and opened. The new buildings have been erected from plans prepared by Mr. A. J. Stenning, for the Great Central Railway Company, who have borne the expense of building, as compensation for the destruction of the old schools on account of the railway extension in the parish.

SCHOOLS, BOUTHAM, LINCOLNSHIRE.—New schools have been erected by the School Board for Boutham. They will accommodate 125 boys, the same number of girls, and about 70 infants. The contractors were Messrs. W. Wright & Son, and the architects, Messrs. Mortimer & Son, both of Lincoln.

REBUILDING OF HOTEL, BRAEMAR, SCOTLAND.—The Fife Arms Hotel, Braemar, Aberdeenshire, is to be rebuilt from designs by Mr. A. Marshall Mackenzie, Aberdeen. The work is to be done in sections, so as not to interrupt the tourist season. The first section, consisting of kitchen and work department, has now been commenced, and is expected to be ready for the visitors' season of 1898. Local granite will be used in the mason work, and the total expense is estimated at about 7,000l.

GIRLS' CLUB-HOUSE, PAISLEY.—The new building to be erected at Ferguslie by Messrs. J. & P. Coats is to be used as a club-house for girls employed in the Ferguslie Thread-Works. The building, which adjoins the works, will have frontages in Back Row and Ferguslie-street, the elevation to Ferguslie-street being two stories and attics, and that to Back Row is to have a basement and three stories and attics. In the basement flat are placed the kitchen, washing-house, laundry accommodation, and heating apparatus, whilst on the Ferguslie portion of the ground floor are the committee-room, matron's room, cloak-room, &c. To the rear of these rooms there is to be a hall, lighted from the roof, with a dining-room and two reading-rooms in the Back Row portion of the building. A library and waiting-room are to be placed in the Ferguslie frontage, with the keeper's house in the attics, and the three floors in the Back Row elevation are to be devoted to dormitories, with two sitting-rooms, also on the first floor. Mr. T. Graham Abercromby, Paisley, is architect of the building.

OFFICES, COLEMAN-STREET, CITY.—A block of offices has been erected on the site of 30, 31, and 32, Coleman-street, and 1, Mason's-avenue. The approach to Mason's-avenue, running between Nos. 30 and 31, Coleman-street, has been increased in width, and the covered way has been reduced from 35 ft. to 22 ft. in length. The architects of the new building are Messrs. Gardner & Theobald.

OPERATING THEATRE, BOLTON INFIRMARY.—An addition has just been made to the building of a new operating theatre. The new theatre has been erected on the west side of the corridor leading to the children's wards, and opposite the opening between the male and children's blocks. The addition is in harmony with the architecture of the old structure, and is built of brick with stone string courses. Entrance to the theatre is gained through a 5 ft. doorway into a vestibule. The vestibule is 15 ft. by 13 ft. is to the right of the vestibule, and is lighted from a window on the north side. The operating room is 30 ft. long by 23 ft. wide, with circular-end windows on the north, south, and west. The floor is carried on iron girders, concreted 8 in. thick, and finished with encaustic tiles. The walls are tiled with white and cream-coloured tiles. A door from the corridor opens into the honorary medical officer's consulting room, and another door opens into the vestibule leading to the theatre. The new theatre has been designed, and the work supervised, by Mr. James Briscoe. The main contract has been let to Mr. John Roberts, builder, and the sub-contracts were as follow:—Ironwork, Mr. J. Booth; slating, Messrs. Wray & Co.; plumbing, Messrs. Vause & Son; tiles, Messrs. Maw & Co. (Staffordshire); lavatory fittings, Messrs. Twyford & Co.; radiators, Messrs. Newton, Chambers, & Co., Sheffield; steam fittings, Messrs. Marsden & Co.; and the electricity and gas fittings by the Bolton Corporation; and sterilisers, Messrs. J. Baxendale & Son.

PAROCHIAL HALL, BOOTLE.—On the 12th inst. St. Matthew's Parochial Hall, Bootle, was opened by Miss Ryle. The hall stands on a site adjacent to the church. At present only a portion of the whole scheme has been carried out. This portion, however, provides the following accommodation:—A hall, capable of containing nearly 400 persons, is approached by a main entrance at the church end, and a subsidiary entrance at the other. To the left of the main entrance are the lavatories and a corridor connecting the hall with the church. The staircase from the entrance-hall leads to a balcony projected into the large hall, and to a young men's room on the first floor. The subsidiary

entrance is in communication with a kitchen on the ground floor. There is also a young women's room on the first floor. The plans were prepared originally by Mr. Charles Aldridge, who, however, did not live to see the work commenced. Its prosecution was entrusted to his son, Mr. Ernest Aldridge, under the superintendence of Messrs. Willink & Thicknesse, of Liverpool. The contractors for the work were Messrs. George Woods & Son. The sub-contractors were Mr. Cuthill for the plastering, and Mr. John Piercy for the gas-fitting.

ROYAL ARCADE, WEYMOUTH.—The Royal Arcade, leading from the Esplanade at Weymouth, is now completed. This building contains fourteen shops, with basements, lavatories, and rooms over, and is covered with an ornamental iron and glass roof, with front and back elevations of Bridgewater bricks and Portland and Cornham Down stone dressings. A band stand has been arranged at the east end of the Arcade. The ironwork has been carried out by Messrs. Walter Jones & Sons; Messrs. Creaton & Co. were the builders, and the building was carried out under the superintendence and from the designs of Mr. C. Orlando Law, of London and Weymouth.

MOORGATE-STREET STATION.—The new superstructure of Moorgate street Station, designed by Mr. Delissa Joseph, has now been completed at a cost of about 18,000l., the contractors being Messrs. J. Allen & Sons. The elevation is executed in Portland stone, and occupies a frontage of about 155 ft. to Moorfields, and of about 90 ft. to Fore-street-avenue.

NORTH STAFFORDSHIRE INFIRMARY.—New operation rooms have just been opened in connexion with this building. The alterations have been carried out by Mr. T. Goodwin, builder, from the designs of Messrs. Lynam, Beckett, & Lynam, at an estimated cost of 1,000l.

CHURCH SPIRE, GREATHAM.—The new church spire which has been added to this edifice was recently dedicated by the Bishop of Winchester. The new spire represents an addition of about 70 ft. to the tower, at the eastern end of the church. The spire is of English oak covered with oak boardings and shingles, and a weather vane crowns the whole. It is protected by a lightning conductor. The two bells in the tower have been rehung. Messrs. J. H. & E. Dyer, of Alton, have carried out these works from plans prepared by Mr. F. Chancellor, of London and Chelmsford.

GIRLS' HOME, NEWPORT.—This new building, which has been erected on the side of the highway leading to Edgmond from Newport, was opened by the Bishop of Shrewsbury recently. The new building is called the "Edgmond Certified Girls' Home." Messrs. Veall (Wolverhampton) were the architects, and Mr. Whittingham (Newport) the builder.

INSTITUTE, LYTHAM, LANCASHIRE.—The foundation stone has just been laid of the new wing of the Lytham Institute. Mr. Grimbles is the architect for the new wing. The estimated cost is 1,500l.

VICTORIA INSTITUTE, MISTERTON, NOTTINGHAM.—This building has been erected in commemoration of the Diamond Jubilee. The architect was Mr. T. C. Massey, of Alderley Edge, and the work has been carried out by Mr. Moody, of West Stockwith, and Messrs. Smith & Chambers, of Misterton.

CLUB BUILDINGS, CREWE.—On the 15th inst. the club erected by the Liberal Unionists of Crewe was opened by Lord Arthur Grosvenor. The club is situated at the corner of Edleston-road and Myrtle-street, and is of red Ruabon brick and terra-cotta. The design was prepared by Mr. Joseph Cavley, of Northwich, and is in the English Renaissance style.

TALL TOWER, NEW BRIGHTON.—The New Brighton Tower has now been finished. In shape it is octagonal, standing on eight legs, the base being 150 ft. across. It is constructed of steel. Messrs. Maxwell & Tuke, architects and engineers, of Manchester, designed the structure, and the work of erection has been in the hands of Messrs. Handside, of Derby, with Mr. John Ashley as clerk of the works. The lower portion of the structure is hidden by a block of buildings, now approaching completion, and 90 ft. high from the ground. In this block will be a theatre for stage plays, with seating accommodation for 3,000 persons; above that a concert and ball room with a parquet floor laid upon springs, with promenade and outside balconies; and on the third floor is to be winter gardens, covered in with a glass dome roof. Visitors may reach the various floors in this building by any of four staircases leading from the two main entrances on the ground floor, or the ascent may be made in one of the four elevators provided. It is from the winter gardens at the top of the main buildings that visitors will commence the actual ascent of the tower. There is a staircase leading up inside the tower, but this is devoted to the use of workmen only, and for visitors there are available four elevators. Each of these elevators will carry thirty persons. All the lifts will be worked by electrical power. The tower lifts will not convey visitors to the actual summit, their landing platform being a floor 56 ft. across, at a height of 354 ft. from the ground. This platform is closed in, but a higher point can be reached by a staircase. Twenty feet above the landing platform is a floor provided with an outer balcony, and 6 ft. higher there is another open platform. Above this again are two other

platforms, and then, by passing up a staircase through the inside of a dome of copper, access is gained to the Crow's Nest, 513 ft. from the earth below.

NEW INFIRMARY PAVILION, HACKNEY.—On Tuesday an extension of the Infirmary, High-street, Homerton, was opened by the Rev. Frederick Shelford, Chairman of the Infirmary Committee. The new building, which will be known as Pavilion A, is situated at the corner of Sidney-road and High-street, Homerton. The new structure, which has been erected from the designs and under the supervision of the board's architect, Mr. W. A. Finch, is of brick. Iron galleries give immediate access to the open air from each of the upper floors. The basement is fitted for the reception of stores, and the three floors above will accommodate 228 patients. The floors are of polished oak, and each ward is 12 ft. from floor to ceiling. The baths and lavatories are in separate turrets connected with the wards by bridges. Access to the upper floors is obtained by means of a lift sufficiently large to contain a bed and attendants, also by a staircase in a turret connected with the building by bridges only. The wards are heated with hot water pipes and central stoves with descending flues, and the walls of the corridors and offices are faced with white glazed bricks. Some of the rooms will be vacated by the erection of temporary administrative purposes, pending the erection of new administrative buildings. The new pavilion has been built by Mr. S. R. Lambie, of Kentish Town, the cost of the pavilion being 33,000l.

NEW BUILDINGS, FORRES.—The building boom in Forres was continued by the Forres Building Company on the Sanquhar lands. The offices at the mansion house of Sanquhar have been overhauled and extended, Forres tradesmen having for a year past been employed in building and other operations. A start has now been made with the erection of a bungalow on an elevated knoll overlooking the garden. It is intended as a residence for the gardener and his employees. On other parts of Sanquhar Mr. Edward, the proprietor, is erecting cottages for farm workers and ploughmen, each building being adapted for two families, both having a kitchen, scullery, and two bedrooms. All the plans are by Mr. P. Fulton, architect, Forres, and the work is being carried out under his superintendence.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, WHITBY DISTRICT.—The Whitby Rural District Council instructed Messrs. D. Balfour & Son, civil engineers, Newcastle, to report on a scheme of water supply for the township of Fylingdale, in their district, including Robin Hood's Bay, Thorpe, and Thorpe Lane. The engineers' recommendations have been adopted by the Council. At Park Gate it is proposed to construct a service reservoir with a capacity of 200,000 gallons. The water will then be distributed over the township in cast-iron mains, with the necessary valves and other appliances.

LOCKS FOR THE THAMES.—A conference of representatives of riparian authorities on the Thames, between Isleworth and Fulham, took place on the 14th inst. at the Hammersmith Town Hall, to consider a new report from Mr. E. Frichard, engineer, with regard to the construction of a lock on the lower Thames. At the last conference, held three months ago, Mr. Frichard reported upon a scheme for a lock at Broomhouse Dock, midway between Putney and Wandsworth Bridges, which he recommended should be constructed at a cost of 280,000l. He was then requested to report with regard to a site at the foot of York-place, Battersea, mid-way between Wandsworth Bridge and the West London Extension railway bridge. He now reported that this site was much superior and more suitable, and that locks and sluices could be constructed there for 220,000l., the river here being narrower. A conditional approval was unanimously given to the new scheme, and it was referred to the constituent bodies for consideration.

PORTLAND HARBOUR.—The tender of Messrs. Woodman, Hill, & Co., of Gosport, has been accepted by the Admiralty for carrying out work in connexion with the defence of Portland Harbour against torpedo attack in time of war. To enclose and securely safeguard the harbour will cost about 650,000l., and the work will not be completed until about March, 1901.

PIER, MENAI BRIDGE.—Mr. F. H. Tulloch opened an inquiry at Menai Bridge on the 14th inst. respecting an application made to the Board of Trade by the Urban District Council to grant a provisional order for the erection of a pier and pavilion and other works. Mr. Webster, C.E., the engineer of the scheme, explained that unless the Board of Trade should direct otherwise, the pier would extend seawards in a southerly direction for a distance of 350 ft. or thereabouts, commencing at a point at the east end of St. George's-road. He estimated the cost at 3,000l., inclusive of the erection of a warehouse and waiting room. On the existing piers there was no accommodation for visitors.

DRAINAGE, HUNGERFORD.—The Rural District Council, at their last meeting, accepted the scheme of drainage and sewage disposal submitted by Mr. E. W. Ives, C.E., of Derby, and it was resolved to

apply to the Local Government Board for sanction to borrow 4,000l. to carry out the scheme.

BIGGLESWADE MAIN DRAINAGE.—At a meeting of the Biggleswaide Urban District Council, held at the Town Hall, on the 19th inst., the sewerage scheme (broad irrigation) of their Engineer, Mr. John W. B. Rooke, was approved of, and a further sum of 150 guineas was voted. The estimated cost of the scheme (exclusive of irrigation land, 40 acres in extent) amounts to 16,000l.

STAINED GLASS AND DECORATION.

WINDOWS, INVERNESS COUNCIL CHAMBERS.—A memorial in commemoration of the Diamond Jubilee year of her Majesty, taking the form of stained glass windows, has just been erected by the Provost and Council of Inverness in the Council Chambers. The centre window represents her Majesty in her robes of State, bearing in her hands the Imperial symbols. Underneath the figure is placed the memorial inscription tablet. The upper part of this window, which is circular in form, is filled with the Royal Arms. In the side windows are portrayed all the Prime Ministers who have held office from the time her Majesty ascended the throne till the present day. The small panels at the base represent commerce and the North Bridge. The circular spans above these lights are filled with panels of the Arms of Scotland. The window was designed by Mr. J. T. Stewart, chief artist with the firm of William Meikle & Sons, who are responsible for the carrying out of the work.

MEMORIAL WINDOW, ALDERMISTON CHURCH, BIRMINGHAM.—A stained-glass window has recently been placed on the north side of the nave of Aldermiston Church, as a memorial to the late Mr. Higford Burr. The work was entrusted to Mr. Philip H. Newman.

WINDOW, ST. CLEER CHURCH, CORNWALL.—The north-west window of St. Cleer Church has been filled with painted glass in memory of the late Mrs. Newson. The three lights each contain a single figure, that on the left representing Faith, the central figure Charity, and that on the right Hope. On behalf of Messrs. Lavers & Westlake, of London, who executed the work, Messrs. J. Sweet & Sons, of Liskeard, completed the fixing of the glass in its stone framework, which has been restored.

ST. JAMES' CHURCH MEMORIAL WINDOW, EDINBURGH.—In St. James' Parish Church, Carson-street, Edinburgh, on the 15th inst., the Rev. Dr. Cameron Lees unveiled a stained-glass window erected to the memory of the late Helen Gordon. The window was supplied by Messrs. Jones & Willis, London.

FOREIGN.

FRANCE.—A new asylum for aged men has been founded at Plassy. M. Vaudremer is the architect. —The celebrated Café Riche, on the Boulevard des Italiens, rebuilt regardless of expense four years ago from the designs of M. Albert Ballu, is now being pulled down. It possessed a quantity of polychromatic decoration in very poor taste. On the exterior was a series of hunting scenes designed by the caricaturist Forain, and reproduced in ceramic by M. Lehnitz. Various ceilings in the building were also painted by well-known artists, M. Felix Barrias in particular. —M. Allain, Inspector in the Paris Department of Architecture, has been appointed architect to the Fourth Section of Paris, in place of M. Moris de Dammartin, who has retired. —M. Bonnat has been appointed President of the Société des Artistes Français, and MM. Loviot and Fremiet Vice-Presidents. M. Jean Paul Laurens is President of the jury of painting for 1898; M. Barrias, of the jury of sculpture; and M. Gignou, of the jury of architecture. —The first stone has just been formally laid of the new hippodrome in Paris, at the angle of the Boulevard du Clichy and the Pont Caulaincourt. —The mean houses abutting against the ancient church of St. Julien le Pauvre are to be pulled down. —Three small pictures by Ingres have been found in the galleries of the Louvre, and have been placed in one of the Galleries. They are reproductions of the "Venus Anadyomene" and "La Source," and a sketch for an Apotheosis of Napoleon. —The question of purchasing the Hôtel de Sens, and transforming it into a museum, is again before the Paris Municipal authorities. —M. Falguière has just completed the statue of the Marquis de Vauvenargues, which will be cast in bronze and erected in Algeria.

—It is announced that the Prince of Wales is to preside on the occasion of the laying of the first stone for the new pier at Cannes in March next. —The jury in the Competition at Evreux for a new municipal theatre have awarded the first premium to M. Léon Legrand, the second to M. Ernest Charpentier, and the third to M. Delaunay and Gossart. —M. Dubois has been elected President of the Architectural Society of Anjou for 1898. —The death is announced, at the age of sixty-nine, of the painter Charles Houry, a native of Belgium but naturalised as a Frenchman, and one of the founders of the Société des Artistes Français. He was a pupil of Léon Cogniet and of the Ecole des Beaux-Arts. Among his principal works may be named "La Mort de Charles Téméraire" (Salon of 1852), the "Dernières Moments de Marie de Medicis" (Salon of 1857),

"L'Heure du Piano" (Salon of 1880), and some interesting works in terra-cotta faience, one of which "Le Printemps," is in the Luxembourg Museum. —The Institut de France has decided that the collections of Chantilly, which will bear the name of "Musée Condé," will be open to the public on Sundays and Thursdays from 1 to 5 p.m., from April 15 to October 15. The parks and gardens will be open on Sundays and Thursdays during the whole year, as well as on public holidays; from 1 to 6 p.m. in summer and from 1 to 4 p.m. in winter.

GERMANY.—A very important competition has just been decided at Wiesbaden, where some premiums were offered for the design of a *Kurhaus* or large assembly-room. An influential jury of assessors had been selected, including Dr. Wallot. The first premium of 300l. was awarded to A. Menz, of Bremen. There was a second premium of 200l. several of 100l., and there were also a number of minor awards. —Of other competitions we notice one for a new Museum for Magdeburg. —Bromberg is to have a large city park. It has been presented to the town by the Government. —We regret to record the death of Herr Wunder, one of the City Councillors of Berlin, whose wonderful collection of drawings and prints relating to the German capital had more than local interest. A number of drawings by Schinkel, in his collection, were well known to architects. —We regret further to record the death of Baurath Sager, who has so long been associated with the large public works of Germany. In reality he might be termed a contractor, though he held an official position to the Bavarian Government. Perhaps "official master builder" would be a right definition of his position. At all events, he contracted for many important railways, for a section of the Baltic Canal, and also for some important improvements in Victoria. The rearrangement of the large site occupied by the Royal Academy will now probably soon be taken in hand, and is receiving considerable attention. As matters stand at present there is some probability of carrying out a large improvement scheme in connexion with the matter, and appropriating much of the ground now occupied by the Royal stables at the back of the Academy for a new National Library. The present library buildings, though of historical interest, are quite unsuited to their purpose.

MISCELLANEOUS.

WILL OF THE LATE MR. J. L. PEARSON, R.A.—By the will bearing date July 6, 1873, of Mr. John Loughborough Pearson, who died on December 11, he leaves personal estate of the value of 51,647l. 10s. 10d. The sole executor of his will is his son Mr. Frank Loughborough Pearson.

PROPOSED DUNDEE BUILDING TRADE ASSOCIATION.—A movement is on foot, it is stated, for the formation of an Association, to be called the Dundee and District Builders' and Quarrymasters' Association, and organised on the same lines as a similar body in Aberdeen. According to a provisional constitution, which has been drafted, it is proposed that the Association should consist of employers belonging to the building and quarrying trades in Dundee and district, and its objects are stated to be the consideration of the state of trade, the rise and fall of wages, regulation of trade prices, and mutual co-operation.

TEES-SIDE MASTER BUILDERS.—On the 12th inst., the first annual general meeting of the Tees-side and District Master Builders' Association was held in the Masonic Hall, Stockton. Mr. John Davison (President) in the chair. The Secretary (Mr. W. C. Cressor) read the first annual report, in which the committee stated they had to congratulate the members on the success attending their efforts. At a meeting held at Stockton on February 17, 1897, convened by Mr. Dickinson, of Middlesbrough, when representatives from the local associations at Stockton, Darlington, Middlesbrough, and the Hartlepool attended, it was decided to form a Tees-side and District Master Builders' Association, having for its principal objects the protection of members' interests, the securing of an equitable contract agreement applicable to the whole district; the securing of arbitration in case of disputes, and the supplying and guaranteeing of quantities. In pursuance of these objects a circular was issued in May last to all the architects in the district asking for their opinion on such matters as the supplying and guaranteeing of quantities, the allowance of provisional sums, joint fire insurances, mode of payments, and arbitration. With one or two exceptions, the whole of the architects thus addressed replied to the circular. The Committee gave careful consideration to the answers, the majority of which were favourable to the Association, and, as the result, issued another circular in September, stating that members of the Association would not tender for work without quantities being supplied and guaranteed on all contracts costing over 400l. The result of that had been that quantities had been supplied and guaranteed in many cases where such a thing would not have been thought of had it not been for that action. They had, in the last few weeks, sent out another circular, asking that an arbitration clause should be inserted in all future contract agreements, and it was hoped that the members would uphold that principle, as it

was manifestly unfair that the person who ordered and controlled the work should be sole judge in cases of dispute. They noted with pleasure the satisfactory state of the building trade during the past year. Work had been fairly plentiful, and disputes few. This report was unanimously adopted. The following officers were then elected for the ensuing year:—President, Mr. J. Davison; vice-president, Mr. Dickenson; hon. treasurer, Mr. Burn; secretary, Mr. W. C. Creaser.—A dinner was subsequently held, Mr. John Davison presiding. J. M. Bottomley, in proposing "The Tees-side and District Master Builders' Association," said after twenty years and upwards of experience as an architect in that district he knew that such an association had been long required, not only for their own interests, but for the interests of those for whom they were all working, and whom they all served. The chairman and the vice-chairman responded. Other toasts followed.

CITY OF LONDON CORPORATION LEASES.—The City Lands Committee have framed a report upon renewable leases of the City's property. A scheme adopted by the Corporation in 1888 enabled lessees (in perpetuity) to commute the fines payable by them in future, and many availed themselves of the opportunity. Lessees on the Conduit Road Estate were offered a choice of two modes: by one mode they could take an eighty years' lease, renewable in perpetuity, on payment of the present value of all future fines calculated on a 3 per cent. table plus one year's rack-rent; by the other mode they could take a similar lease on paying an increased annual rental equivalent to the present value of future fines and one year's rack-rent calculated at a 3 per cent. The Committee recommended that, in view of the low rate of interest on investments which now obtains, the 2½ per cent. table should, in fairness and reason, be adopted instead of the 3 per cent. table for the former, though not for the latter, alternative.

EARTHQUAKES AND BUILDINGS.—In *Nature* for the 13th inst., Professor Milne commences a serial article on "Recent Seismology," which includes some remarks on the influence of earthquakes on buildings. The attention of builders in Japan has been drawn to the fact that the movement is greatest on that side of a building where the ground is softest, and also (which is more important, in regard to the question of foundations) that at a depth of 10 to 20 feet the movements of the ground were found to be less than at the surface.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE: ARCHITECTURAL CRAFTSMEN'S SOCIETY.—A paper, under the auspices of the Architectural Craftsmen's Society, and entitled "Roman and Etruscan Architecture," was delivered recently by Mr. D. Bennett Dobson.

MANCHESTER MUNICIPAL SCHOOL OF ART.—The Committee of the Municipal School of Art have arranged for a course of ten lectures on Classic Architecture to be given by Mr. Hugh Stannus. The lectures will deal with the characteristic features of classical architecture. Each lecture after the first will be preceded by an examination of the work done by the students, and be followed by a conversation upon the subject matter of the lecture. The lectures are especially addressed to those engaged in the study and practice of architecture in the city and district. The first lecture of the course was delivered in the School of Art, Cavendish-street, on the 13th inst. Mr. William Burton, F.C.S., has also accepted the invitation of the committee to deliver a series of four lectures in the City Art Gallery, Mosley-street, on "Material and Design in Pottery," beginning Tuesday, Feb. 1. The lectures will deal with simple earthenware, faience, and fine earthenware, stone wares and porcelains of all periods and countries. The lectures are free to the public.

PUBLIC IMPROVEMENTS, READING.—Colonel J. T. Marsh, R.E., one of the Inspectors of the Local Government Board, held a local enquiry at the Council Chamber, Reading, recently into the subject matter of a petition from the Corporation for a provisional order to empower them to compulsorily purchase certain properties needed for the widening of East Forebury-road; and also of an application from the Council for sanction to borrow 5,000l. for purposes of public walks and pleasure grounds, 4,000l. for purposes of street improvement, and 1,000l. for stables and two houses at their depot in the Caversham-road.

COMPOSITION IN ARCHITECTURAL STUDIES.—A meeting of the Edinburgh Photographic Society was held in the hall of the S.S.A. on the 12th inst., when Mr. H. J. Blane, R.S.A., one of the honorary Presidents, contributed a paper on "Composition in Architectural Studies." At the outset Mr. Blane suggested a definition of composition to show the different conditions under which composition has to be considered by the painter, the sculptor, and the architect. The painter worked upon a surface of canvas, which he could alter and treat according to his will, but which, when done, did not change. The sculptor did his work, like the architect, in his studio, but when brought out to the light of day and put in position, not one aspect of it only was viewed, but it was surveyed from all sides, and therefore, he said, the architect and the sculptor had to make their compositions pleasing from many points of view. He pointed out that the photographer of architectural

studies was under the same disadvantage in that the group photographer could pose his subject in front of his camera, but the architectural photographer had to bring his camera round and round his building or group of buildings until he found out the best position from which he could obtain the most satisfactory picture. In this connexion, Mr. Blane spoke of the great advantages a city like Edinburgh possessed for this branch of photography on account of its openness and the facilities it enjoyed for viewing architecture at a reasonable distance. He concluded with some hints as to the study of architectural work, according to the situation and according to the period of the year and the time of the day, so as to avoid getting either a weak and flat picture or one whose shadows overmassed the leading features of the design.

NEW ORGAN, COTHAM WESLEYAN CHAPEL.—On Saturday, last week, the new organ at Cotham Wesleyan Chapel was opened. The instrument was constructed by Mr. W. G. Vowles. The case of the organ was designed by the architects of the building, Messrs. Curwen & Jones, and the work has been carried out by Messrs. Stephens & Bastow.

CAPITAL AND LABOUR.

BOLTON PLASTERERS AND THEIR WAGES.—The plasterers of Bolton have just sent in an application for an advance in their wages from 9d. to 10d. per hour, and a request to be allowed to start work half an hour later each summer morning except Monday.

MANCHESTER PAINTERS AND THEIR WAGES.—As the result of an application by the members of the house painters' trades-union in the Manchester district for an increase of wages, it has been agreed by the employers to make an advance of one halfpenny per hour above the present rate, to date from next May.

MORECAMBE JOINERS' DISPUTE.—On September 1 last the Morecambe Joiners gave notice for an advance in wages from 7½d. to 8d. per hour; and for an alteration in rules to include double time on Saturday afternoon and Sunday. No action was taken by the masters until recently, when the secretary of the Carpenters and Builders' Society (Mr. John Isaacs) had an interview with Mr. Joseph Willis, who acted as secretary for the masters two years ago. Mr. Willis called a meeting of the masters, and it was decided not to take action until they heard further from the men. A meeting of the masters was held, and they decided to offer the men 8d. per hour advance, no alteration of the rules, but this was not accepted. Subsequently a conference was held, at which both masters and men were represented, and the latter agreed to accept 8d. per hour without alteration of rules, or 7½d. with alterations. The masters would not agree to this, but offered 7½d. an hour, with no alteration of rules. The men would not agree to this, and decided to bring their tools out of their respective shops on New Year's Eve. The masters adhered to their decision, and all the joiners in the town came out. Meetings of the men and masters were subsequently held, and the masters eventually agreed to give 7½d. an hour up to January 1 next, and a 3d. per hour increase after that day, and to reinstate the men. This offer was accepted by the men, who resumed work.

THE PLASTERERS' STRIKE, LIVERPOOL.—The Lord Mayor (Alderman John Houlding) having consented, at the request of both masters and employees, to act as arbitrator in the dispute in the plastering trade in Liverpool, sat at the Town Hall on the 13th inst. to hear evidence on the points contested. The Liverpool Master Builders' Association was represented by Messrs. Thomas Jones, Charles Tanner, Ben. H. Johnson, Robert Johnson, R. Bromley Gardner, J. Cotthill, and J. A. S. Hassall (secretary); and for the National Association of Operative Plasterers there appeared Messrs. W. W. Jackson, J. Griffin, W. Morgan, Richard King, J. Crute, John Kenny, and W. Baldwin, (secretary). The arbitrator sat for nearly two hours, evidence being submitted by both sides on the apprentice rule, country rule, and the time for giving notice of alteration in rules. These points were fully dealt with, and his Lordship intimated that he would give his award at as early a date as possible.

LEGAL.

THE CLAIM AGAINST THE ST. PANCRAS GUARDIANS.

MR. JUSTICE RIDLEY in the Queen's Bench division, on the 14th inst. resumed the hearing of the case of Drew-Bear & Co. and Others v. the Guardians of the Poor of St. Pancras for the assessment of the damages to be paid by the defendants to the plaintiffs in respect of certain breaches of contract found by the Court of Appeal in connexion with the building of the St. Pancras Workhouse.

The case has been fully reported in the following issues of the *Builder*, viz.: November 21, December 2, 1896, January 23 and 30, March 6 and 13, April 17, May 22, November 6, 1897, and January 15, 1898.

Mr. R. M. Bray, Q.C., and (Mr. A. A. Hudson appeared as counsel for the plaintiffs, and Mr. English Harrison, Q.C., and Mr. Wm. Moyes for the defendants, the Guardians.

Mr. Wm. Henry Thurgood, a surveyor, of Great George-street, and a Fellow of the Surveyors' Institution, examined, said he had been in practice for eighteen years as a surveyor, and previously to that was a builder in a large way for many years. He was called in in April, 1893, to measure up the work for the trustees, and he had some knowledge of the work as it was going on. He considered the charge made for loss owing to the plaintiffs obtaining piecemeal possession was a fair one, having regard to the increased expense caused thereby. He should consider the extra expense under that head at 12½ per cent. on the contract price, at least.

Cross-examined by Mr. English Harrison: He arrived at the 12½ per cent. from his knowledge and experience of the work carried out. Mr. H. W. D. Theobald, surveyor, of Great Russell-street, examined, said he acted as surveyor to the Office of Works at the War Department occasionally, and he was the arbitrator who was chosen by Kirk & Randall and the Guardians in respect of the dispute between them. He thought that 12½ per cent. would be a fair allowance for the contractors in respect of the delay in getting possession and for interference in the roads.

Cross-examined: Interference in the roads was caused by ambulances and coal trucks going backwards and forwards to the workhouse.

Mr. W. H. Strudwick, a surveyor practising in New Inn chambers and a Fellow of the Surveyors' Institution, examined, said that he had been a surveyor for thirty-five years, and he corroborated the evidence of the last witness that 12½ per cent. was a fair price to charge.

In the course of evidence for the Guardians, Mr. A. Boden said he was Chairman of the Building Committee of the Board of Guardians at the time the work in question was carried out, and he saw from time to time all the works during their execution. From first to last during the execution of the work, Mr. Fearon did not apply to him to be allowed to make an entrance between block H and the end of block A.

His Lordship: This is a matter for the architect clearly.

Mr. Harrison: If it was a matter for the architect I could deal with it.

His Lordship: The architect gave him one entrance instead of the other.

In reply to Mr. Harrison the witness said he never at any time gave an order to Mr. Fearon to repair either of the two roads. Mr. Fearon never complained to him that the roads were being used by the Guardians.

Mr. A. Millward, Clerk to the Guardians, said he never gave orders for repair of the two roads. He never allowed any traffic of the Guardians to pass over those two roads, and it was contrary to his regulations if traffic did pass over them.

Captain Thomas Miller, the Master of the Workhouse, said no traffic of the Guardians passed over either of the two roads mentioned whilst the work was being carried on.

Mr. J. G. Deane, examined, said he acted as gatekeeper of the workhouse during the whole of the period of the execution of the works. He kept a book recording all entrances of carts and vans coming in at the gate. No vehicles on the Vestry's business came in. Heavy traffic was unloaded at the Commercial-street entrance, and the lighter traffic at the Receiving Ward. His lodge was close to the Vestry Hall, and his duty was to remain at his post all day. He did not remember Mr. Fearon calling his attention to carts coming in at the Vestry entrance.

Mr. Wm. A. McCormick, examined, said he was a builder in the Essex-road, and from his books he found there was no appreciable rise in the price of building materials.

His Lordship: The suggestion is that the rise was in 1892.

Mr. Harrison said he thought the evidence was rather the other way. Bricks and timber were the chief things.

Further examined, the witness said he had examined the invoices in his business for the purpose of seeing whether there was a rise in bricks and timber in 1892. At the end of 1892 he could not detect anything appreciable, but since 1895 there had been large strides.

This being the close of the evidence, Mr. English Harrison addressed his lordship on behalf of the Guardians, and Mr. Bray replied on behalf of the plaintiffs.

His Lordship, at the conclusion of the arguments, said he would take a few days to consider the matter, and would give notice as to when he would be able to give his decision.

Judgment was reserved accordingly.

ACTION AGAINST BUILDERS ON A LEGAL GUARANTEE.

THE case of Vigers v. Cobbett & Co. came before Mr. Justice Bruce in the Queen's Bench division on the 15th inst., it being an action on a guarantee given by the defendants, a firm of builders and contractors, for payment of timber supplied to a builder named Cox who was doing work for the defendants. The case depended solely upon whether an order given by the plaintiff to the defendants, authorizing them to collect the timber from a general stock belonging to the plaintiff and

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Stables and Coach House, Lightcliffe near Halifax	J. T. Walsh, Archt. 119 Back-church, Halifax	Jan. 28
Sixteen Houses of Cardenish, Dalry, Yorks	E. F. Wilkeson, Archt. 25 Park St. Leeds	do
Rebuilding Business Premises, High Street, Bedford	B. T. Beckwith, Archt. 12 Bridge-st. Bedford	do
Steel Girder Bridge over River Beane, near Laurencetown	G.N. Ry Co. (Irish) J. W. Cameron & Co.	District Engineer, Belfast E. M. Whigham, Archt. 16 W. 1st St. Station, Ter- Bury St. Wm. Archt. Bradford	do
Eight Houses, George-street, Batley, Yorks	do
Iron Pipes	Bury (Lancs.) Corp.	T. Rigby, Farnon & Lane, Bury, Lancs.	do
Water Main, Belmont, Rampton	do
*Stoneware Pipe Sewers	Tottenham U.D.C.	P. R. Murphy, Esqr. 412 High-road, Tottenham	do
*Oak Fencing	County Borough of Walsby	Mr. Lewis Appell, Town Clerk, Walsby, Yorks	do
*Annual Contracts	Willenden D.C.	C. Claude R. Jones, Esqr. Public Office, Willenden	do
House, Lamb-street	Walker (North) Co. op. Soc. Ltd.	Rev. N. Jones, Esqr. Walker, North-st., Yorks	do
Additions to Brook Cottage, Windermer, Flaming, Pannings, & Avenhoe, Jackson, N.B.	Highland Ry. Co.	W. Roberts, Esqr. Windermer, N.B.	Jan. 28
Five Houses, Thornhill, Dewsbury	do
Alterations, Pultice Station	Middlebrough Corp. ....	.....	do
Widening Plymouth-road	Buckfastleigh (Devon) U.D.C. ....	.....	do
Two Shop and Houses, Cook-street, Kelghley	do
Others	do
Sewering, &c. Wulfrid-road	do
House, & Eaton, Port Lancaster	do
Severance Works, Manchester Old-road, &c. Spence-road	do
Rebuilding, &c. Schools, Hume-street, Perth, Partridge-road, King's Lynn	do
Pipe Laying (8,000 yards)	do
Private Street Works, Clay-st. &c.	do
Road Works, Bridge-street, Wat	do
*Road Making and Paving	do
New Workhouse	do
Addn to Stables, Bartholomew-street, Newbury	do
Additions to Bank Premises, More Church	do
Forty-eight Houses, Birchfield Estate, Redden Bridge, Yorks	do
Flagging, &c. Cottingham-road	do
Two Houses, East Ardsley, near Wakefield	do
Road Materials	do
*Broken Granite	do
Nine Houses, Collier-road, Cork	do
Schools, Mount Zion, Palsley, Yorks	do
Making-up Great-land-road, Shenfield	do
Street Works, Kilmorey road	do
Street Works, Loughborough, Leics.	do
Bakery, Stables, &c. Pountney-street, Bury, Yorks	do
*Stoneware Pipes, Manchester, &c. Sewering, Levelling, Paving, &c. Roads	do
*Electric Light Wiring and Fitting	do
*Underground Transformer Sub-station	do
Additions to School, Mr. Derby	do
Pair Villas, Marydye, Cork	do
Covering in Portion of Wards Burd	do
Six Shops in Houses, &c. Kirkcaldy, W.H.	do
Filtering Tanks, &c. New Breapeth Colliery, Durham	do
Sewers &c. (8,000 yards)	do
Sewers (3 miles)	do
Main Drain, Providence-terrace, Portown, Newport, Mon.	do
*Wood Paving of Suspension Bridge	do
Howard's House, &c.	do
Church, Tallyhall, near Mallow	do
Distinctor Buildings, Sheds, &c.	do
Pipe Sewers (2 miles)	do
Road making, West Brownish-road	do
Cattle Market, Bourne, Lincs.	do
64 Cottages, Mallow-street, &c. 50 Cottages, Junction-street, &c. Mallow	do

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
*Tribute Dwelling Houses, Isle of Grain, Kent	Admiralty	Constable Station	Feb. 1
*Erection of Paraffin House	do
Buildings at Gas Works	do
Aqueduct (5 miles), Talla	do
*Cast Iron Pipes, Hydrants, Valves, &c.	do
*Pipe Saver, Pump Well, Filtration	do
*Sewers, Manholes, &c.	do
*Alteration to Stairs	do
*Road making and Paving	do
Road Works	do
Medical Officers' Residences, Gambia	do
British Bank at Fanning Station	do
Pair Villas, Seville Park, Halifax	do
*Vagant Works, Brier House, Altern	do
*Public Conveniences	do
*Schools	do
Severance Works	do
Sewerage Works	do
Office, House, Sheds, &c.	do
Rail Metal	do
Paving Works, &c.	do
*House and Landscapes	do
*Three Dwelling Houses, Hove	do
*Enlarging Fire Stations at Hamp	do
Infirmary and Workhouse, Bytton	do
*Discharge and Sundry Works at Infirmary	do
*Concrete Reservoir with Roof, Re	do
New Infirmary Buildings	do
*Holes Gravel and Slag	do
School, Two Rumparts	do
*School	do
Brick Tank and Gasholder	do
Chapel and School, St. Ives, Cornwall	do
*Fireproof Flooring, Stairs, Partitions, Warming, &c. Plaster, Laundry	do
Two Houses, Merton, North	do
Alterations, &c. to Business Premises, Dublin	do
Landscapes, Stables, Harbours	do
Additions, &c. All Saints Church,	do
St. Charles, Strickland place, Kendal	do
Church Restoration, St. Michael's,	do
Additions to Police Station, Tumb	do
St. Cottage, Corporation-street	do
Victor's Arcade, Land's Lane, &c. Leeds	do
R. and Street Works, Fenton Park	do
Refrigerator, Greenhouse, Park	do
Refrigerator, Greenhouse, Park	do
Two Shops and House, Fairfield	do
Stables, &c. Mascardian, Llanelli	do
School, Ventnor-street, Leeds	do
Six Houses, Bank-road, Finedon	do
Station Hotel, Annan, N.B.	do
*Clock and Tower (Designs & Estimates)	do
*Canal Works, Port's Lodge, &c. at Workhouse	do
Two Houses, South Moor-lane, Batley, Durham	do

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applica- tions to be in.
*Clerk of Works	Acton Sch. Bd.	50s. per week	Jan. 24
*Building Inspector	do
*Clerk of Works	do
*Clerk of Works	do
*Surveyor & Registrar and Surveyor	do

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. v. vi. viii. ix. & x. Public Appointments, pp. xvi. xvii. & xix.

ying at the docks, constituted a "delivery" at the date of the order, or whether delivery took place only when the goods were collected.

Mr. Chamier, counsel for the defendants, contended that by the Sale of Goods Act, the property in the goods in question did not pass until the defendants had in some way appropriated or earmarked them, inasmuch as the delivery order only gave authority to draw generally upon the plaintiff's stock lying at the docks, and contested the argument

that in these circumstances the order to collect the goods was a document of title constituting delivery.

His Lordship decided that in a commercial transaction a document did pass the property, and that the action was not prematurely commenced.

In these circumstances he gave judgment for the plaintiff.

Stay of execution with a view to an appeal was refused.

Mr. Peile appeared as counsel for the plaintiff.

INFRINGEMENT OF ANCIENT LIGHTS AT BROMLEY.

The case of Simon & Powell came before Mr. Justice Romer in the Chancery Division on the 18th inst., it being an action by Mrs. Hannah Maria Simon, a widow, the owner of a messuage and premises on the north side of the Widmore-road, Bromley, Kent, known as Keston Lodge, to recover from the defendant, Mr. Wm. Powell, the owner and

ASHTON-UNDER-LYNE.—Accepted on a schedule of prices for the construction of a sewer in Cavendish-street, for the Corporation. Mr. J. T. Earnshaw, C.E., Town Hall, Ashton-under-Lyne:—
R. C. Fish, Ashton-under-Lyne

ILLUSTRATIONS.

Design for a Bishop's Throne: By Mr. W. D. Caroe, F.R.I.B.A.	Double-Page Ink-Photo.
Design submitted by Mr. H. T. Hare, A.R.I.B.A., in the Colchester Town Hall Competition	Double-Page Photo-Litho.
New Premises, Exchange-street, Manchester.—Mr. Charles Heathcote, F.R.I.B.A., Architect	Double-Page Photo-Litho.
The Market House, Shrewsbury, Measured Drawings by Mr. A. R. Keighley	Double-Page Photo-Litho.

Blocks in Text.

Plan of the District proposed to be taken as the Site for the Westminster Improvement Scheme (reduced from the Ordnance Map of London).....Page 56	Plan for laying out the South Westminster neighbourhood, and connecting it with St. James's-street and Pall Mall by a new road across St. James's Park, following the line of the present foot-bridge. By the Editor. (Reprinted from the BUILDER of September 21, 1878).....Page 99
Block Plan of Westminster Improvements, as proposed by the Victoria Embankment Extension and St. John's Improvement Co. " 97	Competition design for Colchester Town Hall. Plans. (For Ground Floor Plan see lithograph plate)..... " 108
Suggested Plan for arrangement of the Southern portion of Proposed Building Site, opening out St. John's Church to the River and to the new streets. By the Editor..... " 77	New Premises, Exchange-street, Manchester. Plan..... " 109
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The Westminster Improvement Scheme.



URING the last few days a great deal of public attention has been drawn to the proposal for a rebuilding of a portion of the Westminster neighbourhood on

a large scale by a private Company, the conditions of which are embodied in a Bill under the title of "The Victoria Embankment Extension and St. John's Improvement Bill." The stated objects of the Bill are "To authorise the construction of an Extension of the Victoria Embankment and certain Street Improvements and the taking of Lands in the Parish of St. Margaret and St. John the Evangelist, Westminster, in the County of London; and for other purposes." As usually happens in such cases, there is a considerable opposition to the Bill on the part of various persons resident on or having interests in the area proposed to be taken; how far this opposition, and the reasons put forward for it, are justifiable, will be considered later on.

In a "Note" in our issue of December 4 we gave an outline of the measure so far as it was then before the public. The recent "deposit" of the Bill and plans enables us now to consider the scheme more in detail. It may be as well first to consider the present condition of the district proposed to be dealt with. Fig. 1, reduced from a portion of the large-scale ordnance map of London, gives the plan of the district, and will enable the reader to follow the statement as to the intentions of the Company which has been formed to carry out the proposed scheme. Some little indication of the history of the neighbourhood may perhaps also not be out of place.

The company seek for powers of compulsory purchase over an area of about 120,000 square yards, lying between Great College and Little Smith streets and Victoria Tower-gardens (north) and Horseferry-road (south), and including Abingdon, Millbank, and Marsham streets. They propose to widen Church-street (leading out of Smith-square) and the north side of Horseferry-road between the foot of Lambeth Bridge and the

Gas Light and Coke Company's premises, and to stop up and discontinue almost every street in the limits we indicate.* For these they would substitute an embankment, with a 40-ft. roadway, from Victoria Tower-gardens to the bridge-foot, a street or avenue 90 ft. wide from the line of Abingdon-street to a point in Horseferry-road, 70 yards west of the bridge, with a street, 60 ft. wide, from the avenue to join Great Peter-street, and another, 50 ft. wide, along the side of Smith-square, parallel to Marsham-street; and also rebuild the last-named thoroughfare at a width of 60 ft.

Thus an old and highly-interesting quarter of Westminster, having Smith-square at the central point, is marked for complete change. Several of the original houses remain, distinguished by their iron-work, wooden doorways, and spacious staircases. They occupy nearly all the site of the conventual pleasure and produce-gardens, since commemorated by Orchard-street, Vine (now Romney) street, and Bowling-street and alley (north part of Tufton-street). At the junction of Great College-street (formerly Dead-wall), Abingdon-street (Dirty-lane), and Millbank, stood the abbot's dam and mill, turned by an affluent of the Tyburn, and a gate of the monastery; many a stream and rivulet watered the grounds, lying, in places, scarcely above the river's high tide. When Colonel Blood lived in Bowling-alley, in a house pulled down eighty years ago, at the corner of Tufton and Peter-streets, he enjoyed a fair prospect of much of the garden-land; Black Dog-alley, close by, was built over the garden of William Benson, or Boston, elected abbot in 1532. Conspicuous in the midst stands the church of St. John the Evangelist, built in 1721-8 at a cost of, it is said, 40,000*l.*† for the parish which had been taken out of St. Margaret's. It was the second of the "fifty churches" built by the Commissioners, to whom Sir John Vanbrugh was surveyor. He entrusted the design to his pupil Archer. In the Crowle Pennant are two prints, cut down for mounting, but lettered:—

"Mr. Archer's design of St. John's Church in Westminster, as it was resolved upon by the Commissioners." The alterations made since to this

* Namely, the whole, or part, of College-mews; Abingdon, Millbank, Romney, Tufton, Wood, Great Smith, Barton, Cowley, Carpenter, Great Peter, and Little College streets; Smith-square, &c.

† Allen's "London," vol. iv., 1828.

design were done without the consent or knowledge of Mr. Archer."

Archer's design differs from that of the existing church mainly in respect of the four towers (now rounded on plan), the stylobate and steps, and the treatment of the broken pediments above the porticos. It shows another arrangement of columns and their entablature for the towers, which were to be square on plan, and above them, instead of the present bell-shaped leaden cupolas capped with cones, he had four turrets with pilasters at the angles, connected by a balustrade, and each terminated by an obelisk finial. Elmes says that Archer intended to erect also a central tower and spire, but this seems impossible in respect to the plan of the church, which presents no foundation for such a feature. He might have intended to have a timber spire or flèche carried on the roof. The fabric was tied together with iron bars passing through the walls and columns, externally and internally; the former are still retained. A fire on September 26, 1742, destroyed the interior and roof; the interior columns were not replaced. In 1825 W. Inwood carried out some repairs, and increased the seating from 1,200 to 1,800. In 1885 the interior was altered and the old pews removed, at a cost of about 800*l.*, under Mr. Butterfield's superintendence. The organ (1727) was repaired by Hill in 1840; the font (1847) was carved by J. Thomas after Barry's designs.

In 1720 Little College-street was known as Piper's-ground, and had but one or two houses. Tufton-street was built by Sir Richard Tufton, of Tothill-street (*ob.* Oct. 4, 1631), son of Sir John Tufton, of Hothfield, ancestor of Lord Hothfield; Barton and Cowley streets were built by Barton Booth, the actor—some say he named the latter after Cowley, the poet, a Westminster boy; others that he called it after his seat at Cowley. At his house in Millbank died Hawksmoor, March 25, 1736; he was buried at Shenley, near St. Albans. At 24, Abingdon-street died Thomas Telford, 1834; he is buried in the Abbey; and at No. 8 lived David Roberts, the painter. In Wood-street lived John Carter, draughtsman and antiquary, who contributed in 1798-1817 to the *Gentleman's Magazine* the series of critical papers signed "Architect." Marsham, Earl, and Romney streets are named after Charles Marsham, Earl of Romney. On the wall of



Fig. 1.—Plan of the District Proposed to be taken as the Site for the Westminster Improvement Scheme (reduced from the Ordnance Map of London).

No. 68 was formerly to be seen a tablet, "This is Marsham-street, 1688;" in Great Peter-street was one inscribed, "This is Sant Peter-street, 1624, R. [a heart] W." At No. 13, North-street, lived Elliston. The Gas Light and Coke Company, whose premises line a considerable length of Horseferry-road, had its origin in the enterprise of F. A. Winsor, who first exhibited his new light in St. James's Park on the King's birthday, 1807. The Vine-garden and Mill next to Bowling-alley are cited in the overseers' books, 1565. King Edward VI. gave the Vine-garden, with a parcel of ground called the Mill Bank, valued at 58s., to one Joanna Smith, in "consideration of service."

So much for history. As to the site as at present existing, it may be said that for the most part it consists of streets which are narrow and tortuous, and flanked by dirty and dilapidated house property the clearing away of which would be a public benefit. There are certain portions, however, of the site which must be excepted from this condemnation. There is St. John's Church, which the Company do not propose to touch, though, as we shall see, they are not treating it very well. There are the houses along

Abingdon-street, which are good and respectable houses, but not of sufficient value to stand in the way of an important improvement scheme, though, as we have seen, not without their historical interest. Round the corner at the north end of Abingdon-street is the large stone house which is on rather doubtful tradition said to have been the residence of the first Duchess of Marlborough, and which on its own account is worth preserving. The boundary of the land sought to be acquired includes the old building called the Jewel Tower, but the Company's plan seems to carefully indicate that they have no intention of touching that. There are some fairly good old houses on the north side of Smith-square, in which St. John's Church stands. Then, on the irregular triangular ground between Great College-street and Wood-street are the quiet secluded streets, Barton-street and Cowley-street, flanked by small but interesting old houses in good condition, and which constitute a pleasant and peaceful corner of older London which no right-minded person would wish to see disturbed. It is in regard to this quarter especially that the strongest feeling of opposition to the scheme has been aroused.

The scheme proposed by the Bill is shown *en bloc* in fig. 2. The areas shaded black of course represent building land, not buildings, though one may probably assume that there is an intention of covering them with buildings as closely as the Building Act will allow. The most prominent feature in the scheme is the wide road or boulevard, starting from Old Palace Yard opposite the end of Westminster Hall, and terminating at Horseferry-road. The circular explaining the views of the Company states that—

"The London County Council propose to improve and widen Millbank-street to a uniform width of 60 ft., and the purchase of the land for a portion of this widening has already been arranged. It is intended to substitute for this widened road an avenue 90 ft. wide (the width of Regent-street) passing in a direct line through part of the area before described to the northern end of Abingdon-street opposite the Victoria Tower—the object being to open up the Abbey and Houses of Parliament on that side, and provide an improved and suitable access to these historic structures."

The circular proceeds to urge that a large portion of the area referred to is at present occupied by a class of buildings which are not only very unsightly and unsuitable to the neighbourhood of the Houses of Parliament and Westminster Abbey, but which



Fig. 2.—Block Plan of Westminster Improvements, as proposed by the Victoria Embankment Extension and St. John's Improvement Co.

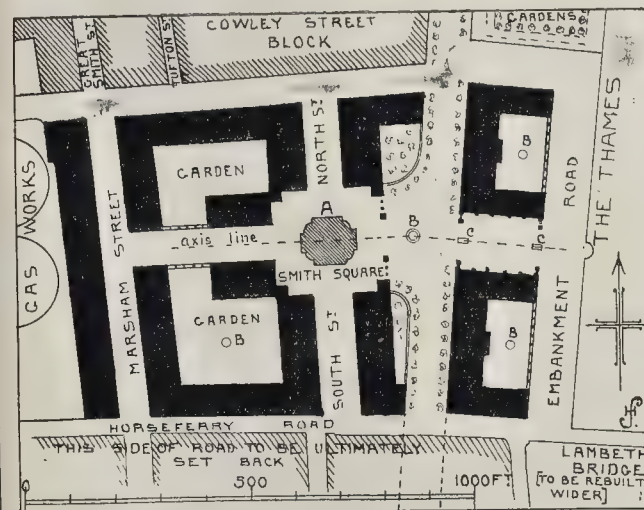


Fig. 3.—Suggested Plan for arrangement of the southern portion of Proposed Building Site, opening out St. John's Church to the River and to the new streets. By the Editor.

A—Church. B—Fountains. C—Pedestals for Sculpture.

from their insanitary condition may become a positive danger to the community at large; that the scheme will have the effect not only of making sanitary one of the most insanitary districts in London, but of replacing the present buildings with other structures of an architectural design befitting so important a situation; and that the proposed widening of Millbank-street to 60 ft., as before stated, for which arrangements have been made by the County Council, will, if carried out, impose a heavy charge on the rate-payers, which this scheme will entirely obviate. The same argument, of course, applies to the continuation of the embankment and the river wall, which would otherwise have to be done, if at all, out of public funds. The Bill makes proper provision for the re-housing of those of the working class who may be ejected.

Looking at the plan as it stands, the new boulevard is a great and obvious public improvement, and in our opinion would fully compensate for the loss of the Abingdon-street terrace of houses, though in fact these might be retained; without compromising this portion of the scheme to any serious extent, for the fronts of the houses are just within the boulevard line at the northern end of the terrace, and cut only a few feet into it at the southern end; it would only mean leaving a slight "neck" at the southern end of the terrace, and carrying on the boulevard its full width after it cleared that point. It must be observed, however, that 90 ft. is a very meagre width for a street of this kind, which it is apparently proposed to line with trees, and that 120 ft. would be a much more suitable width. In other respects, there are defects in the plan which are obvious at a glance. The new streets are too narrow; the plan is evidently laid out with the view of getting as much building land as possible and letting anything else take its chance. St. John's Church is boxed in a very injurious manner, which cannot be properly appreciated except by those who know the building; for the church really fronts, architecturally, north and south—the columned porticoes are on the two flanks, which form the most important aspect of the church architecturally, and North-street, a tolerably wide street which now leads up to the north portico (the main access to the church), has been blocked up on the plan, without the slightest thought or consideration for architectural effect. In fact, the hand of no architect has been in the scheme at all so far. The continuation of the embankment is far too narrow to deserve the name, as compared with the Victoria Embankment and its drive, and we may presume that from the main road a continuous terrace of houses will shut out all view of the river.

In fig. 3 we give a sketch plan showing one out of various possible ways in which the building land might be laid out so as to give a better architectural effect to the whole than one sees much promise of here, while providing sufficient open land in the shape of gardens to allow of breathing space and render the place attractive. It must be clear to any one who looks at the matter from the architectural point of view, that St. John's Church is the key of the situation; and as long as it remains there, the most ought to be made of its effect. And we may observe, moreover, that St. John's is

a much more notable building than people realise who only see its four angle turrets over the houses from the river, and repeat one or two stale witticisms about them. It is a very original architectural conception, with a good deal of power and picturesqueness as a whole, though the details are open to a good deal of criticism. It ought to be opened up, on this opportunity, so as to be seen from the river, and the main roads across the site ought to be axial with it. Accordingly we have shown them so arranged, restoring "North-street" which the company are proposing to wipe out, and putting a corresponding "South-street" on the other side. Of course the really finest arrangement would have been to have had a grand *place* formed by a row of buildings all round the north, west, and south sides of the site, a row of trees in a parallel line inside of them, and the church as the central object; but this would no doubt be considered an insufficient building area. As it is, the square gardens we have shown would have been better without the return wing of buildings along part of the fourth side, but it would probably be complained that building land was being recklessly thrown away. The difference between the angle of the church and that of the boulevard and the embankment necessitates a turn of the axis, a fountain marking the junction of the two axes indicated by the dotted lines. The embankment is shown as a wide drive, and the buildings between that and the boulevard are divided so as to leave a wide space through which the church can be seen from the river. It would be easy to improve on this scheme no doubt, but on the whole it would have a good effect, and it would put about as much building on the land as it will accommodate with the best results for a first-class neighbourhood.

As to what we have called on this plan the Cowley-street block, we suggest that the company should drop it out of their scheme, thereby eluding the principal part of the opposition levelled against them, and leave it for the owners, the Ecclesiastical Commissioners, to deal with. The leases of this property fall in in a few years, and it is rumoured that when that time arrives the Ecclesiastical Commissioners themselves will be exceedingly likely to rebuild a great part at all events of the property. But they may come to a different conclusion; and it seems as well, at all events, not to anticipate the wrecking of this property, which every one, even those who may be convinced of the advisability of rebuilding it, would regret in one sense to lose, but to leave it for later consideration by its present owners.

Having noticed the valid objections to the scheme, we may now turn to one or two of those which appear to us to be mistaken, and which are mostly based on imperfect or inaccurate information. Some people are very indignant that the neighbourhood in its present state should be considered unhealthy, and adduce examples of those who have lived for many years within its boundaries and enjoyed excellent health. To this it may be answered, in the first place, that the fact of certain persons having lived for a long time in a neighbourhood does not necessarily prove that it is not an unhealthy neighbourhood; it only proves that they were persons whose constitutions were not injured by circumstances which might very well have been

injurious to others. But on this subject of the condition of the site we may as well give some definite information. In regard to the character of the soil and sub-soil on the site, there is a considerable thickness of superficial beds. The uppermost is (1) alluvium, beneath which are (2) gravel and sand, and these rest on (3) London clay. The alluvium is composed of silt and clay, and, locally, thin patches of peaty material; it varies in thickness over the area in the neighbourhood of St. John's Church and Horseferry-road, especially near the river. Its maximum thickness is probably about 7 ft. to 8 ft. Alluvium usually forms a damp and unreliable foundation. The gravel and sand are of considerable thickness on the site. We have no record of borings made on the actual spot, but at the Gasworks in Horseferry-road 30 ft. of gravel are recorded as having been passed through. This gravel is usually water-logged, and where the alluvium is thin and the foundations of houses pass through it, water may be found troublesome in the basements. Then there is the London clay; a stiff impervious clay, which keeps up water in the gravel.

The superficial deposits alluded to are at certain places in Westminster (and on the site of this "improvement scheme," for aught we know to the contrary) much impregnated by the sewage of many years; for prior to the inauguration of a general system of drainage filth found its way into the water-logged gravel. The soaking of the river water into this stratum, and the extent to which it backs up the drains at high tides, are in themselves an injurious influence, which would be nearly put an end to by the building of a river wall. No doubt affairs in this respect have much improved in recent years; but the site under consideration must, nevertheless, be a suspected area, and it would be satisfactory to have this point proved at once. The disturbance of the ground and the making of deep foundations for large houses cannot fail to test the quality of the water in this gravel, and it must be reckoned with. Much "made ground" occurs in the area, overlying the alluvium, and in parts of Pimlico. The ground had to be artificially made up for 6 ft. or so to secure satisfactory foundations.

Then it is objected that the boulevard joins Horseferry-road at an inconvenient point, some distance from the bridge and from the opening into the Grosvenor-road. But this objection arises from ignorance of circumstances which cannot be stated in the Bill, because they are not directly connected with the Scheme, but which are of considerable importance. In the first place, the engineer to the London County Council has already prepared a design for the rebuilding of Lambeth Bridge—we fear it will prove architecturally a very bad one, but it is certain to be an improvement in an engineering sense, and for the greater height of the new bridge a rise will be required from about the point where the boulevard cuts Horseferry-road, in order to reach the crown of the bridge with a sufficiently easy gradient. Secondly, the Grosvenor-road comes round after a little while to the line of the boulevard prolonged, and it is believed that the Duke of Westminster, whose property commences on the south side of Horseferry-road, is proposing eventually to continue the line of the boulevard until it reaches the line of

Grosvenor-road beyond the curve. This is indicated by the dotted lines of continuation on fig. 3. Some of the objectors also want to know why the boundary line of the claim should make a sudden detour westward to include "Mr. Labouchere's well-known house." How do they know that this may not be by Mr. Labouchere's own wish?

Taking the scheme altogether, therefore, we must say that, with proper attention to architectural effect and *emplacement*, it promises to be a great public improvement, carried out at private cost and as a private risk, and as such merits support.

Nearly twenty years ago a plan, by the present editor of this journal, for a Westminster improvement scheme on a still larger scale, was published in the *Builder* for September 21, 1878; and as this number is now out of print, we republish the plan here (fig. 4). In this plan also St. John's Church is made a central object in the laying out of the district, which is arranged so that it can be seen from the river on one side, and forms the central object at the end of a long vista of gardens on the land side. One point in this plan was that as the terraces are all arranged in a line east and west, a vista to the river would be obtained down all the roads, together with the advantage of unchecked circulation of air, and a south light to one or other side of every house. The plan includes, as will be seen, the provision of a new main road, to be called "St. James's-road," directly connecting the Westminster district with Pall Mall and St. James-street by means of a wide bridge over the St. James's Park Water, on the line of the present foot-bridge. Another point is that the space now occupied by the Victoria Tower Gardens is utilised for a Campo Santo or place for the burial of and for monuments to great men, on a site which we have always thought peculiarly suitable for such a purpose, close to the state entrance to the legislative palace. A new road, "Campo Santo-road," leads from the junction of Victoria-street and the proposed St. James's-road up to the monumental entrance to the Campo Santo. The scheme includes also the rebuilding of Lambeth Bridge on a monumental scale.* We fear it must be regarded as among those schemes which it is interesting, even inspiring, to work out on paper, but which are never destined to be realised; but there are points in it which may perhaps not be without interest at the present moment.

NOTES.

The engineers' strike is at an end. Readers of the daily papers are already aware of this fact. What are the two great points which now stand out clearly in regard to this struggle? The first—and this in recent articles we have alluded to—is that combinations of employers are as strong, or stronger, than those of workmen. It is clear, therefore, that the result of this industrial battle will be momentous. Employers now find that they can successfully combat the strongest trade-unions so long as they have a good cause which can enable the members of their own body to hold together. The second point which seems obvious is that the

* The line of the river embankment is carried further out into the river than in the scheme now proposed, in order to get it at right-angles with the axial line of the church and terraces, and thus produce a more grandiose and symmetrical effect.

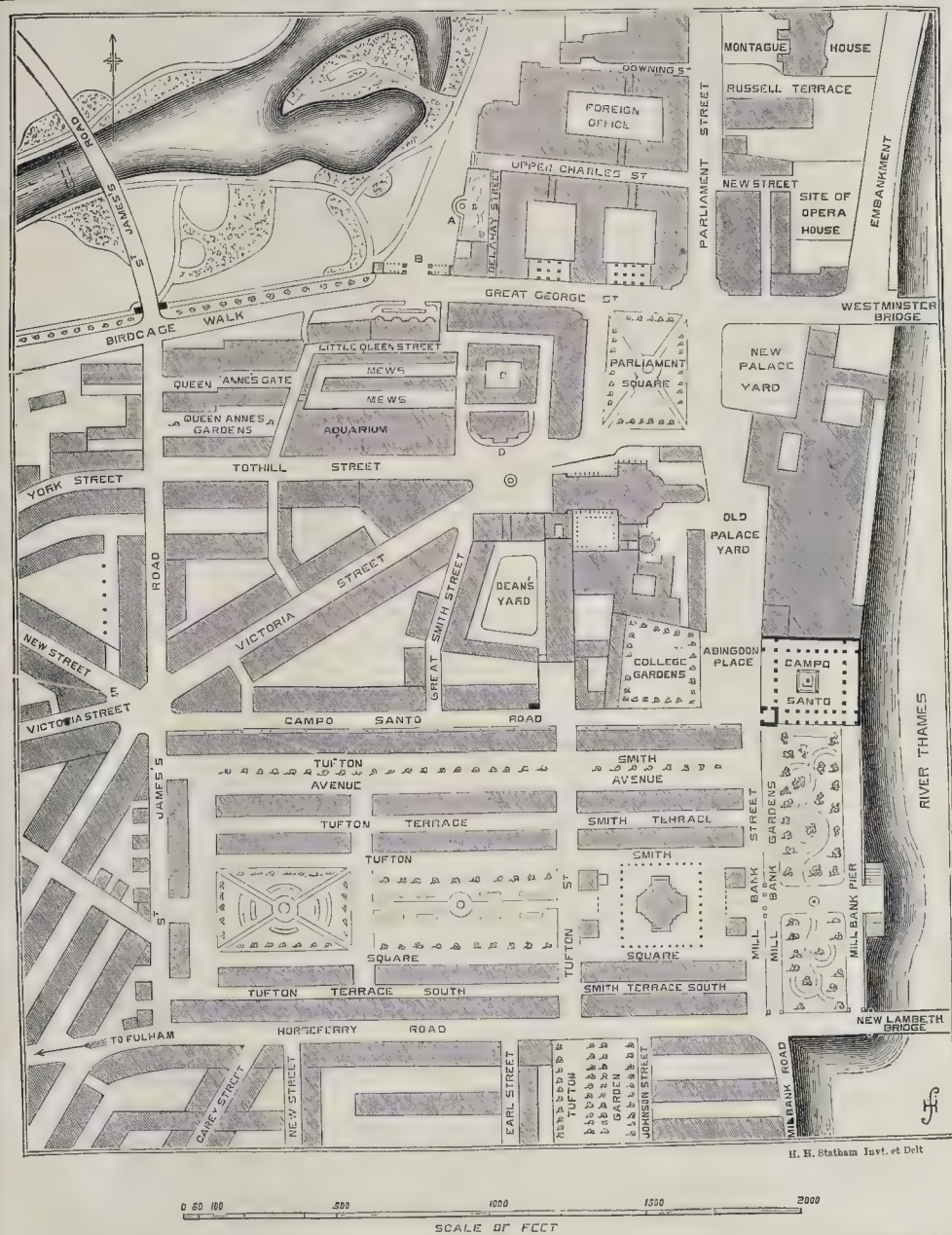


Fig. 4.—Plan for laying out the South Westminster neighbourhood, and connecting it with St. James's-street and Pall Mall by a new road across St. James's Park, following the line of the present foot-bridge. By the Editor. (Reprinted from the "Builder" of September 21, 1878.

professional leader of the trade-unions has too much power. The men's professional leaders began, prolonged, and ended the strike. Their policy has disastrously failed. The large trade-union has become a kind of industrial autocracy, and the men appear to be as much at the mercy of their leaders as are the people of Russia at that of the Tsar.

A French
Compliment
to the
Institute.
notice on the Institute of British Architects.

The writer refers, among other points, to the great regularity and consistency with which the affairs and publications of the Institute are conducted and issued—"une régularité à nulle autre pareille," and it is not surprising that this element in its proceedings should attract the notice of Frenchmen, accustomed to the easy-going manner in which the proceedings of French meetings of the same kind are issued, often months after date. After complimenting the late Secretary and the present Secretary on the conduct of the Institute Journal, the writer adds a warm

eulogium on the President's opening address of this Session, noting also that the speeches in moving and seconding the vote of thanks for the address were "mieux qu'une marque de courtoisie"—"il y a, de la part des membres autorisés de la réunion qui prennent cette initiative, une appréciation et d'heureux développements ajoutés à l'adresse du Président." The following remarks in regard to the President's address show how Professor Aitchison's lectures on architecture are appreciated abroad:—

"Les architectes familiarisés avec la langue

anglaise savent seuls de quelle haute valeur d'enseignement se recommandent les lectures sur l'Architecture, faites chaque année aux étudiants de l'Académie de Londres par l'éminent professeur, à la fois praticien consommé et érudit et fin lettré; aussi de nombreux architectes de tous les pays doivent savoir grand gré à M. le Comte de Suzor, architecte de la ville de Saint-Petersbourg, qui a promis, lors du récent Congrès international de Bruxelles, de donner une traduction française de ces lectures."

Tests with
Fire-Resisting
Materials.

WE understand that the Executive of the British Fire Prevention Committee, to which we have had occasion to refer, is considering the question of the independent testing of fire-resisting materials, which is of such importance to the architect. On the Continent such tests are undertaken by the Government, but as there seems no chance of such a course being taken in this country, we have to leave our tests to private initiative, and for this purpose an independent committee, on which the various interests are well represented, is, perhaps, the best method of attaining the end. As it has been felt that the experience of trade representatives is of considerable importance, independent of their individual feeling in promoting their special kinds of work, a special commercial section has been formed to which practically all the leading specialists belong; but on questions of general policy their combined opinion is only to be represented to the Committee through one mouthpiece, *i.e.*, through the chairman of the section, who is, however, also to be elected from outside, and is to be an architect or civil engineer of recognised position.

A Last-Century
Sketch-Book.

THE 20th *Hallisches Programm*, by Dr. Carl Robert, is a curious document of special interest to Englishmen. It contains the catalogue and description of 393 leaves from the sketch-book of an English artist in Italy, between the years 1760 and 1789. The artist, whose name was probably, though not certainly, Tresham, does not appear to be otherwise known to fame; but he had archaeological tastes, and sketched with great care and accuracy in museums and private collections. The time at which he sketched, *i.e.*, the Winkelmann and Goethe period of art criticism, was unfortunately *after* the date when most of the restorations of ancient statues, &c., were made, but to this there are some valuable exceptions, *e.g.*, he sketched the replica of the Eirene of Cephisodotus in the Torlonia collection. In his day, the goddess held her natural attribute, the cornucopia of plenty. This was later on destroyed to make the statue into a more fashionable subject, *i.e.*, a Niobe. The sketch-book, which is of considerable antiquarian interest, is now in the possession of Frau Generalin von Bauer, of Cassel. We draw attention to it because it is quite possible that many such documents may be lying unnoted in private hands in England.

The
Boadicea
Statue.

THORNYCROFT's group of Boadicea and her daughters in the chariot, the model of which has been erected on a pedestal at the west end of Westminster Bridge, is not very happily placed there, and the situation at all events cannot be regarded as one to be adopted permanently, since it is meaningless and out of balance in an architectural sense. As to the group itself, no one at the present

moment would accept that classic-looking figure as a representation of Boadicea; she is quite out of keeping with the barbarous-looking chariot and even with the figures of her daughters beside her; and the treatment of the drapery is weak and conventional. The plaster model may well be preserved in some museum, as a spirited effort of one who was a prominent English sculptor in his day; but whether it is worth while, or even desirable, to cast it in bronze and place it in a public position as a work of English sculpture is very questionable.

Consumption of
Water in Cities.

WE shall naturally wait till the London Water Commission now sitting has issued its Report, or at all events concluded its evidence, before making any general comments on the tendency of the inquiry; but we may draw attention to one point which was gone into in Sir A. Binnie's evidence on Monday last, in regard to the amount of water which ought to be supplied per head to meet the requirements of modern habits of living. After what we have heard sometimes from engineers who seem to be survivals from what may be called the "antediluvian period," when a bath was a weekly ceremonial, to the effect that 25 to 27 gallons per head was ample for the daily supply of London, it is gratifying to find that the engineer of the London County Council does seem to have arrived at some perception of the need for a larger daily supply than satisfied our forefathers, although he does not by any means go far enough. He does, however, state 35 gallons as a minimum, and would prefer 40 gallons. But this is still most inadequate. A large bath of the ordinary type, filled as full as it can be used for immersion, takes at once about 50 gallons; and many people use this now. In Paris, though the French are not supposed to be such an ablutionising people as the English, 47 gallons per head is consumed; but American statistics show far larger amounts: Baltimore, 109 gallons per head per day; Boston, 111; Chicago, 190; Buffalo, 325; &c. After this kind of evidence, it is not likely that Londoners will much longer accept the restricted and meagre allowance per head which water companies and their expert witnesses think sufficient. The inhabitants of a city like London ought to have practically unlimited water supply, and we ought not to rest till we get it.

The Metropolitan
Fire Brigade.

ONE of the results of the Cripple Gate Fire is that we are to have various minor improvements in the Fire Brigade, though, as a matter of fact, it appears that these improvements were suggested by Commander Wells previous to that conflagration, his proposals being dated in September and October respectively. To summarise the Chief Officer's proposals, we would say that he desires above all to minimise the annual loss of life, which in 1896 had reached the figure of 106, and seems to have been regularly increasing during the last ten years. The idea of giving us horsed fire-escapes (which, by the bye, we believe have been common to other countries for some twenty years) is a very good one, for not only are better facilities thus afforded for life-saving, but the Brigade is able to reduce the number of manual fire-escape duties, which have always been a serious drain on the active

strength of the force. It has been a bold stroke of the Commander to condemn the old fire-escape with which London has been so long associated, and we trust that his new appliances, besides being horsed, will be more adapted to the modern forms of building than is the case with the antiquated appliances at present on our streets. With regard to the general strengthening of the Brigade, the extra men, together with those released from the special duties referred to, must be very valuable. But we should not forget that Sir Eyre Massey Shaw already considered one thousand men necessary in the early seventies. The extra horses are, perhaps, even of major importance, as they will give the Brigade a greater elasticity than has been the case up to the present. What with more men, appliances, and some new stations, an expenditure of nearly 200,000*l.* is to be incurred and the maintenance account is to be increased by 23,000*l.*, though, of course, these improvements are not to be confounded with any general reform of the Brigade's methods and efficiency. The money will be well spent, but we would suggest that the new stations should be sufficiently roomy to take more appliances and men than contemplated at present, as there is not the least doubt that when we have had another catastrophe like the Cripple Gate Fire we shall have to very materially strengthen the force in every direction.

Electrical
Installation
Rules.

IN the 1898 edition of the electrical installation rules issued by the Liverpool, London and Globe Insurance Company there are several additions rendered necessary by the growth of systems of "free wiring" in various districts, and by the rapid extension of electric traction. We notice that precautions are specified which it is desirable to take in special cases, such as in corn, oil, and textile mills, or in theatres. Arc lamps are now allowed in the working rooms of textile mills or the like where there is a considerable quantity of combustible flyings in the air, provided that they are each enclosed by two globes. The regulations concerning the necessity of a fireproof cover for motors have been relaxed. It is recommended that accumulators should not be situated in any position where in the event of a fire occurring and the fire hose being used damage would be done to machinery by the acid overflowing. In conduit wiring means must be taken to exclude moisture from the conduit where the conductors leave it as at the terminals of fittings or where the metallic sheathing has been removed or cut. There are also several excellent rules dealing with the new lead-covered twin wires so much used in "free wiring," and it will be a blow to some enthusiastic electricians to see that the lighting of insured premises from dynamos feeding trolley wires, or from the trolley wires themselves, is absolutely prohibited. These rules are thoroughly up to date, and architects and electricians will find their perusal very instructive.

The Recovery of
Gold from Low-
grade Ores.

MAJOR-GENERAL WEBBER'S paper on the electro-chemical treatment of ores containing the precious metals, which was read on Thursday to the Institution of Electrical Engineers, is a valuable contribution to industrial science. After giving a careful and

accurate history of the discovery of the methods of precipitation of gold and silver by the aid of the electric current, he described the Pelatan-Clerici process, which he has had under his observation for the last two years. From tests made by the inventors on samples of low-grade ores from over 200 mines, it appears that they recovered a very large percentage of the gold from them—in some cases over ninety per cent. So impressed was General Webber by the value of the process that he was instrumental in introducing it into the mining district of British Columbia. Drawings were shown of the arrangements of a mill which he designed for treating the ores by this process. Everything is done to minimise labour; the ore is carried straight by rail from the "dump," and pulverised and treated or extraction without any handling. With twenty-five horse-power fifty tons of the ore can be treated per day in this mill. The triumph of the electrolytic methods, so long delayed by the rough treatment often accorded to them in mines, over the simpler method of deposition by zinc shavings, is now assured.

In pursuance of a faculty granted in July last by Dr. Tristram, Chancellor of the Diocese, the removal of human remains from this grave-yard, by the London Necropolis Company to Woking, is now in progress. The ground, lying on the north side of Russell-court, and south of Vinegar-yard and Drury Lane Theatre, was laid out as a children's playground by the Metropolitan Public Gardens Association in 1886, at a cost of 180*l.*; four years later its maintenance was taken over by the London County Council. The land, measuring 112 ft. by 107 ft., will be taken for purposes of a proposed new road through the area lately cleared along the west side of Drury-lane, and it is stated that the Duke of Bedford, having acquired the site from the St. Mary-le-Strand Vestry, defrays the charges of digging and clearing the graveyard, and reimburses the Association for the expenses they incurred. The burial ground is one of the three or four which have been severally identified with that described by Dickens in "Bleak House;" some go far afield in that matter and lay the scene of Lady Dedlock's death at the gate of a graveyard in Ray-street, Clerkenwell.

THE exhibition of the works of the late landscape painter Louis Français, which has been opened at the Ecole des Beaux-Arts, is of great artistic interest. It consists of two sections. On the ground floor are arranged the lithographs, water-colours, and pastels, on the upper floor the paintings, accompanied by two fine portraits of Français, one by M. Bonnat, the other by M. Carolus-Duran. Among the lithographs is an exceedingly charming one of a mother and child, under the title "Le Baiser." In the upper gallery the large and luminous landscapes of Français, representing scenes in the Vosges, in Italy, in Provence, or in the outskirts of Paris, form a collection of quite exceptional interest and artistic power. As a curiosity may be mentioned also a small landscape in which the figures, in Louis XV. costume, were put in by Meissonier.

MR. ELGOOD'S "Drawings of Gardens in England and Italy," at the Fine Art Society's rooms, show that he is still progressing in the treatment of this charming class of subject, and some of the works here are among the best things he has produced. In one or two of the old-fashioned formal garden scenes Mr. Elgood is running Mr. Fulleylove very close. The treatment of architectural subjects in some of the drawings, especially those of Pompeii interiors, is also good, though we may observe that in the view of the "Temple of Juno at Girgenti" (28) the columns are not upright. One or two studies with a profusion of flowers in the foreground as "Michaelmas Daisies, Tangle" (3) are especially successful. There is a weakness, however, in the skies in the drawings, which seem to be put in in a rather perfunctory manner and with a great deal of similarity. But there is much to enjoy in the collection.

THE collection of water colour drawings (and one large oil painting) of the Down country, by Mr. Thorne Waite, on view at Messrs. Dowdeswells, is interesting especially because it shows us the work of a very gifted but rather over-refining painter in a more free mood, less occupied with the aim of finishing up a landscape to the highest point of delicacy and balance of effect. Thus the study (3) for the picture of "Would-be Trespassers," "The Way over the Downs to Littlehampton" (9), "Lewes" (17), and "Banff" (36) are all studies in a broader and less worked-up style than we are accustomed to from this artist; "Banff" especially is an exceedingly bold and unconventional work, with a very fine sky as a background to the somewhat dreary scene. "A Devonshire Village" (61) nestled in a crevice between two downs, and "The Pathway between Deal and Dover" (64) are among the best drawings in the room.

THE annual exhibition at the Cercle Volney is particularly brilliant this year. As usual, there are many portraits, among them two remarkable ones by M. Benjamin-Constant, and others by MM. Jean Veber, Weerts, and Rixens. M. Henner exhibits a landscape in Alsace, treated in the veiled half-light which characterises all his work. M. Bouguereau exhibits two pictures, a group of little girls around a fountain, and a profile head of a woman entitled "Tragedie," M. Jules Lefebvre also has his female head, under the title "Jeanne la Rousse." We may mention also M. Tattégren's "Pêcheurs de Harengs," a powerful and broadly-painted work; a figure-study by M. Raphael Collin; some fine landscapes by MM. Nozal, Rigolot, and Gosselin; and in sculpture, the "Sirène" of M. Denys Puech and an "Etude" by M. Alfred Boucher.

THERE has been some fear expressed that the picturesque site of Henley Regatta is to be spoiled by a new railway bridge to be carried over the Thames by the Great Western Railway Company. From an "interview" published in the *Pall Mall Gazette* it appears that the bridge will be a good way above the regatta course, and very likely not be visible from it, though it does not follow that it will not spoil the quiet reach above

Henley. The amusing part of the "interview" consists in the assurances of the manager of the Railway Company that every care would be taken that the bridges at Henley and Marlow should be "ornamental in character and harmonious in their forms;" "as a matter of fact they will be trellis-like in pattern and really ornamental in design." The pretty word "trellis-like" no doubt reassured the *Pall Mall* interviewer, who seems to have innocently accepted this description of what is evidently an ordinary lattice-girder bridge.

BOOKBINDING EXHIBITION AT THE SOCIETY OF ARTS.

In a room on the ground floor of the Society of Arts in John-street, Adelphi, an interesting collection of examples of book-binding from an early date down to the seventeenth and eighteenth centuries has been brought together, and will remain on view until February 7. Some Indian MSS. are lent by the Secretary of State for India, and include one in Burmese characters written on palm leaves, gilded and painted with gilt leaves and boards. The examples of Japanese work are chiefly bound in various coloured brocades, one or two, however, being in Makimono, or roll form. A MS. sermon is enclosed in a japanned box ornamented with gilt circular ornaments of a conventional type. Elaborate examples of Persian work are also shown, and an interesting collection of brass and other stamps, and various tools used in bookbinding.

Perhaps the most attractive portion of the collection is that devoted to English work. It may be divided into two parts—the mediæval examples in stamped calf, and the later examples of tooled morocco. Amongst the former are several very beautiful specimens of stamped work; a book bound by Richard Pynson, c. 1495, with panel with Tudor rose: "Speculum Aureum," in brown calf by John Reynes, c. 1520, with design "Redemptoris mundi arma" on the front cover, and the Royal arms and Tudor rose on the end cover: "Historia Scholastica" in brown calf, signed G.R. with four panel stamps on the front and the Royal arms on end cover. Both these latter have their heraldry very beautifully modelled and designed. Another, Erasmus, "Enchiridion Militis Christiani," 1519, is of stamped calf with large stamped panels representing the "Annunciation," and the initials A. H. on one side, and the Tudor rose on the other. A smaller example by an unknown binder, circa 1520, in light-brown calf, is ornamented with a series of small panels, including the Royal arms, Tudor rose, fleur-de-lys, and pomegranate. Another example by John Reynes, c. 1520, has the Baptism of Christ, and St. George and the Dragon, in large stamps on its covers. Of the later type of English bookbinding, the two volumes by Samuel Brown, of the Hague, 1649, would be hard to beat for delicacy of workmanship. They are a copy of the "Electra" of Sophocles, for Princess Elizabeth, and a volume for Charles II.; both are in blue morocco, with inlaid centres of red morocco, the whole being elaborately tooled. Two simpler examples are two volumes in black morocco, with portrait and crowned initials of Charles I. dated 1642 and 1649. Another for Charles II.—the works of King Charles Martyr—bound by Samuel Mearne, is in red morocco, with the Royal Arms in the centre. Amongst many other examples, all of which have their own particular points of beauty in design and workmanship, are a Bible, 1616, in brown morocco richly tooled, for James I.; Charles I. copy of Bishop Andrews' Sermons, 1631, also in brown morocco; a Funeral Poem in Memory of Sir Joseph Wolfe, 1711, by Elkanah Settle, in black morocco, with boldly-designed shields of arms; and two fine folios, both in red morocco—a Bible, Oxford, 1680, vol. i., with elaborate tooling; and Haynes' State Papers, 1740, with a very beautifully designed border. A Hebrew Bible, supposed to be the work of Samuel Mearne, is in dark morocco, elaborately tooled in blind gold and silver.

The foreign examples include French, German, Italian, and Netherlandish work. To the last-mentioned belongs a small book, "Valentinus Cratoaldus," bound by Martin Vulcanius c. 1515.

with small panel stamps on each cover representing stags, unicorns, dogs, and griffins. Next to it, and similar in design, is a copy of Erasmus, "Christiani Matrimonii Institutio" (1526), in brown leather, bound by Johannes Bolcaert. A German book-cover is embellished with medallion portraits of Luther, Huss, Melancthon, Erasmus, and others, and the initials and date—H. E. 1575. Two curious examples of two books—The Psalms and New Testament in both cases—bound together, are lent by Mr. Huth and Mr. Charles Elton. They are similarly bound in white satin ornamented in one instance with an iris on the cover worked in coloured silks, and in the other with a tulip. A fine example of tooling is "Rationes Dubitandi," &c., in brown calf, lent by Messrs. J. & J. Leighton. Nearly forty examples are exhibited of French work. The gem of the collection is undoubtedly the "Traité de la Charité," a MS. of the seventeenth century; a small book bound in red morocco, inlaid with citron and olive morocco, and tooled all over in *pointillé*, with gilt and painted edges—the work of Le Gascon. Another, smaller in scale, "Heures Chrétiennes," Paris, 1635, in red morocco, with olive centre inlay, belongs to the school of La Gascon. A large book, beautifully bound, is "Notitia Dignitatum Imperii Orientis," &c., Geneva 1623, in brown morocco, the covers having the arms of France and Navarre under one Crown, and the crowned L and orders of SS. Michael and Esprit, bound for King Louis XIII. A somewhat similar treatment occurs again in a presentation copy from Louis XIV. in brown leather, with the Royal arms, and semée of fleurs-de-lis and crowned L's on the covers. A very beautiful binding is "Les Statuts de l'Ordre de St. Esprit," 1578, in red morocco, with the royal arms and collars of the order on each cover and a dove in each corner. There are also several examples of coloured bindings of sixteenth-century workmanship.

Of many examples of Italian work shown, too, a Sallust, 1546, in brown morocco, with a good border, and a volume also in brown morocco, with the arms of Pope Junius III., are good examples amongst many. Enough, however, has been said to show that the exhibition is of the highest interest, and should be visited by all interested in the art of book-binding.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

ADDRESS TO STUDENTS.

THE sixth general meeting of this Institute was held on Monday at No. 9, Conduit-street, the President, Professor Aitchison, R.A., occupying the chair.

The minutes having been taken as read, it was announced that Mr. E. G. Stead had been reinstated a member of the Institute.

The President then delivered the following address to students:—

"It has been the custom for the President to say a few words to those who have just entered on the study of architecture, and it is one of the most grateful tasks that he has to do, for he can look forward to those happy times when some of you aspirants may have conferred an inestimable boon on your country by designing monuments that will delight your contemporaries, and may be hereafter the admiration of the world.

Speaking personally, it is the student's welfare that I have most at heart, not only because I see how many of my own youthful days were wasted from having no proper direction, but also because it is the one feature in all architectural epochs over which the elders can have the greatest influence. At present we know not how to produce genius, nor how to turn the public mind to desire and take an interest in noble architecture. We have abolished symbolism, so that the bulk of buildings do not tell their tale, and the public are ignorant of what is being done for them. In the triumphal arches of the Romans, a goddess leaning on a wheel told the public that the Emperor made roads. If any statesman knew his business, every good sculptor in the kingdom would be fully employed in sculpturing buildings to tell the poor what was done for them: how they were taught, cured, looked after in their old age, and in their sickness and infirmities; and how law and order, peace and industry, were being taught to the savages who surround our Empire. It is in the interest of the students

and the art, that I have proposed to omit from the examinations all that is not purely architectural, for this now shuts out those who have not received a good general schooling. We do not want to shut out a genius, not even a resolute and determined worker, because he has not learnt Greek, Latin, French, or German.

I do not suppose Raphael had much schooling when he was taught to draw at three years old, and yet he not only became the greatest painter of modern times, but a sculptor, and an architect too. We are not surprised that a man with such inventive genius as Raphael should become skilful as an architectural designer when he had learnt the elements of architecture; but it is surprising that he should have been one of the great constructors of his age, for you must recollect that Bramante on his death-bed recommended him to the post of head architect to St. Peter's. I do not suppose that Palladio had much schooling when he was but a mason's boy, nor our own Ware when he was a chimney-sweep.

I have devoted twenty years in trying to gain an insight into the causes of the great architectural epochs of Europe, and this is the conclusion I have come to. They seem to me to result from the set of the public mind towards enriching its age with monuments which embody the general aspirations. To accomplish this there must be hoarded wealth, noble desires, and architectural judgment. There must be, too, those endowed with the genius to express those aspirations architecturally, and highly skilled craftsmen to carry them out. As far as I can judge, genius is the power of invention, and is mostly accompanied by that high general capacity we call talent. This heavenly gift of genius and this general capacity are, however, only the raw material which has to be worked up. Genius has not only to learn what is necessary to express its conceptions, but to strive to do its best.

Architecture is a structural art; and therefore the art of construction is the most necessary thing to be known. The science of construction is statics; consequently the elements of statics must be known. A knowledge of statics, too, gives us a true ratio between every part of a structure, and it gives the real shape that each part must take; if we were as clever as Nature, it would in all probability give us a beautiful shape. Unfortunately, we are far from being so clever, and consequently we have to learn by other means how a beautiful shape can be made out of the necessary shape. For this purpose we must study deceased architecture and Nature. Every piece of deceased architecture that we admire can be made to show us the aesthetic laws that govern it and produce its excellence, and these laws are as capable of being employed now as then. Every important portion of an ancient building may have the reason extorted from it as to why it pleased at its creation, and pleases us now; but from our greater knowledge, and from the necessity of using other materials, we may see that the proportions then used are not now applicable: for instance, a Greek Doric column showed the statical knowledge of its day, but it certainly does not now. Our materials and climate are different; the emotion now wanted is probably different, and the æsthetic sentiment of our day is probably different too; so we must get some of our hints and solutions from Nature's works. There are in the first place human beings and animals, and there are thousands of different sorts of trees, of leaves, of grasses, of buds and fruits, which have beauty in different degrees, and we should learn from these how the beauty we want can be attained by various shapes and various proportions.

Without the gifts of the mathematical and the artistic capacities no man should become an architect; but there is another requirement which we call planning—that is, how to make each room, hall, passage, and staircase answer its purpose, and how to pack them in the most convenient way. This may be called common planning; but there is artistic planning as well, which is the choice of forms which are not only appropriate for use but are agreeable to the eye. I would by no means discourage any one who loves architecture and will study it from being an architect, for there are various degrees of power and excellence in architectural works, all of which make up the realm of architecture. We do not despise the violet because it is not so grand or so lasting as the oak.

The smallest cottage, if perfectly arranged,

perfectly constructed, and perfectly proportioned, may be as delightful to contemplate as the mansion, the palace, the town hall, or the cathedral, though it does not require the same knowledge, the same daring, and the same invention. You must bear in mind that nothing great is reached in the fine arts without simplicity, but lovely simplicity is reached by great labour, and takes about ten times as long to arrive at as ornateness. 'Oh! what a power has white simplicity!' Just now there is a great inclination to get effects by exaggeration, or by ways that involve little thought or trouble, such as by the distortion of the orders, the sticking on of bits of rustication all over a building, or by putting water-gates into the attics of buildings.

We must not forget the proverb that 'the human mind is greedy of novelty,' so much deplored by William Morris and by Mr. Ruskin, though the desire for novelty is natural to man, and cannot be overlooked or overcome; for each generation has not the same knowledge or desires as the preceding one. In eating, the most delicious food soon palls, hence the proverb of 'Nothing but eel-pie.' Let us, instead of deploring the taste for novelty, echo Tennyson's words: 'Let the great world spin for ever down the ringing grooves of change.' True novelty is obtained by development. We see how Nature develops her types; and if we had lived in the palmy days of Greece, we should have seen how the young clodhopper was developed into grace and beauty by training.

It is rather nauseous and rather ridiculous to hear so much talked of a new style; particularly when it is supposed that a clever man can invent it. The real new style is to be attained by the improvements that come about by the altering of proportions through our greater knowledge of statics and the strength of materials, by making our buildings perfectly suitable to the new requirements of our age, by the suiting of our mouldings to the climate, by the greater cultivation of outline, and by a deeper knowledge of our own light and shade.

The hideousness and ignobleness of our clothes render contemporary sculpture impossible; we have not even arrived at what the Italians call 'handsome ugliness,' and we have, when the present is represented, to confine ourselves to the brutes and to vegetation.

Though I may seem to say twice-told tale, but one that has been told many times in each generation, it cannot be too often impressed on the young. Men cannot always judge of what they are capable, so that if a student loves the art sincerely, but appears to have no capacity for it, he cannot be sure of this; his capacity may require much cultivation, and if he woos the art, in season and out of season, he may find he has it. Etty, the Royal Academician, who eventually painted flesh so admirably, was the butt of his fellow-students, but, by resolutely pursuing his labours and never losing a moment, he became excellent at his art after some twenty or thirty years of unremitting study. Moderate your wants, and be contented with the poor pecuniary rewards your industry can attain. Your ambition should be to create something that will charm and elevate your fellow-men through centuries. Those who look for money as the main thing should be surveyors or valuers. Nor am I going to treat architecture as a thing to be done in broken time, nor, to look on it, as it is mostly looked on now, as a lower branch of the knowledge of the value of land and the price of bricks; nor as an antiquarian revival; but as a creation of the true and the beautiful as understood and felt in our own day.

I mainly address myself to those who have the ambition to be poets in marble, stone, brick, iron, and wood, who desire to endow their country with a building that may rival the Parthenon, the Erechtheum, the Propyleum, or the Choric Monument; the Pantheon of Rome, or with one that may vie with the interior of St. Sophia and St. Mark's, with the Scuola di San Marco, with the Cornaro-Spinelli Palace, or with the Town Hall of Brescia. Think of Milton, who got the price of waste-paper for his 'Paradise Lost,' but who 'made himself an everlasting name.'

In some of the fine arts the mere exercise of them is its own reward. In the concord of sweet sounds this is certainly the case, and why should not the creation of the true and beautiful in architecture be its own reward? There have been those great and pure souls that asked for nothing, but were contented to

and raise their fellows without even a thought of fame. Surely such exist among us? I cannot some of us be content to endow our country with a priceless treasure, with a monument that all mankind must admire and thank for, without an afterthought of fame or fame? Do we not admit and are the architect of the Pantheon at Rome, though his name is still unknown? It is only likely that the name of Formentone was known to the architect of the Town Hall of Brescia. We were not Socrates; that soldier who perished in the sentry box at Pompeii, and Marcus Aurelius as examples? And surely there it have been thousands who have only sought to do their duty, and there must be thousands of them.

We have at least an example of one at Englishman of perfect courage and perfect evocation, Gordon. Let us hope that as at a soul may be found amongst our own artists."

Mr. Ernest George, Vice-President, then read the notes on the designs and drawings submitted for the prizes and studentships, in the course of which he said:—"With numerous well-executed drawings before us, we are bound to recognise the proficiency that obtains in the art of draughtsmanship. I suppose when most of the noble monuments of the past were built, there were no such accomplished draughtsmen as many of you. It is a good thing to attain facility with the fingers, and a good method of expressing ideas, and I believe it helps materially towards design. Yet final ideas are few, while pretty drawings are many, and a taking manner of drawing sometimes conceals the lack of anything to say. It may become a snare. It is well to keep in mind the fact that architects' drawings are only a means, and not an end. They are not pictures, but they are documents of the architect's scheme: they should convey to his client an idea of the house he is to have; but their first object is to show the draughtsman the work that is to be done. The architect who is head and shoulders above the rest of us, confesses to the burning of his beautiful drawings after they have served their practical purpose. This is not a custom one could commend. In preparing these drawings, one of you will have speculated on what the assessors desired to see. Taste is a varying entity, and depends with each of us on the condition of the mind with regard to certain forms or colours that appear to us with freshness or with pleasant associations, or that we after they have been too often played upon have become trite. Perhaps this is especially felt in certain so-called 'Queen Anne' features which were pleasing when first introduced by the hands, but which we have seen done to death. In a street we commonly find the most richly and richly decorated building is a black-house, and we feel that a gentleman's house must be severely plain. Choice marbles, in, are so freely used in restaurants and in literary works that, from association, we become used to employ a beautiful material that nature has placed in our hands. We are familiarised with so much commonplace and meaningless ornament that the eye rests with assurance on any broad wall surface, and we are conscious of a reaction in favour of utter simplicity. A cynic has said that life would be durable but for its pleasures. We feel that the vernacular buildings around us could be cleared of all ornaments and futile efforts to please. It requires an artist's hand to dispose and wisely restrain the sculpture or ornamentation, which becomes a source of delight when it finds its right position. Still, there is fitness in all things, and if your subject for design be a concert-hall for a wealthy city, or a mansion for a nobleman, you must not apply to the bare treatment that would be admirable in a barrack."

Mr. George then proceeded to criticise some of the designs and drawings, in regard to which he expressed our own opinion last week, p. 77. The President then distributed the prizes and studentships to the successful students. Their names were given in our last issue, p. 84. Professor Roger Smith said that before the meeting concluded he should like to refer to the honour which had been conferred upon their President. The Royal Academy had done itself an honour in conferring the full membership upon Professor Aitchison, and they felt that that well deserved reward was to a certain extent a feather in the cap of the Institute, as well as a recognition of the great learning and the great skill which the President had so freely placed at the disposal of the

Academy as Professor of Architecture. Those who had had the opportunity of hearing or reading the President's Academy lectures must know that the erudition and the research and skill which had been combined in them were among the circumstances which had tended, together with his works and standing, to procure that distinction; and he ventured, in the name of the meeting and in the name of the Institute, to offer the President the very cordial congratulation of his professional brethren on this happy occasion. He desired to be allowed to represent for a moment the students who were so largely present that evening. He had been trying for a good many years to teach architecture, and that circumstance at least, if nothing else, had kept him a student from day to day; therefore he wished as a student to thank the President on their behalf for the stirring words which he had addressed to them that night, and for the many wise and pregnant suggestions which his address contained.

The President, in reply, said he was extremely obliged to them for the very kind way in which they had received the accession to the full-membership of the Academy which he had lately had conferred upon him. As Professor of the Royal Academy for ten years, and as lecturer there for nearly eighteen, he had endeavoured to do his duty, he had devoted a very considerable amount of time to the possibility of again making Architecture progressive. He most sincerely hoped that the importance of architecture to the nation, and in a secondary way to the world, might be fully grasped by the people of the present, and that we might look forward in the next century to a much greater recognition of its merits, and to the important duties it performs. All architects, however old they might be, so long as their faculties continued, were always students. He only looked upon himself still as a very humble student. He certainly felt the greatest interest and the greatest desire for the welfare of their own students, not only there, or belonging to the Institute, but every architectural student in England and in the world. It was, he felt, a possibility for those to whom Nature had been bountiful enough to give genius to create for themselves a certain amount of immortality and also to confer a benefit upon their country, which it was impossible to reckon and value, by the erection of noble buildings. Let them consider what the architects who built the great temples in Greece, and others who had erected imperishable monuments in other countries, had conferred, not only on their country, but on the world! Every person who professed to have a desire for cultivation and enlightenment, and who had the means, went to Athens, to Rome, Constantinople, Florence, and Venice, to see those great works. It was a great thing, in any one of the arts, to create something that was a monument to one's country, and which would be admired hereafter by the world; and he thought that genius prompted the men who had it, to do their utmost and to scorn delights, so that they might attain perfection by striving, by pains, and by self-denial. Nothing could be more becoming for them, nothing could be finer for the country, nothing could be better for the world—it was an example for all to use their talents to the greatest extent, to do nothing by which they could in any way lessen the powers that they had. Let them hope that amongst their students some might be blessed with genius and erect monuments which will give distinction to their country.

The President announced that the next meeting would be held on the 7th prox., when Mr. E. O. Sachs will read a paper on "The Housing of the Drama."

The meeting then terminated.

At the meeting held on the 17th inst. the following candidates for membership were elected by show of hands, under By-law 9, viz.:—As Fellow, A. A. France, F.S.I., Leeds; as Hon. Corr. Members, Leopold Eidlitz, New York; and Valère Dumortier, President of the Société Centrale de Belgique.

Y.M.C.A. INSTITUTE, HAMILTON, LANARKSHIRE.—This building, situated in Gateside-street, has just been opened by ex-Provost Wylie. The Institute, which is a three-story building, erected from plans by Mr. Alex. Cullen, architect, Hamilton, contains on the ground floor a hall, committee-room, and cloak-rooms, &c., and on the first floor, reading-room, library, and caretaker's house, while the upper flat is to be let as dwelling-houses disconnected with the association rooms.

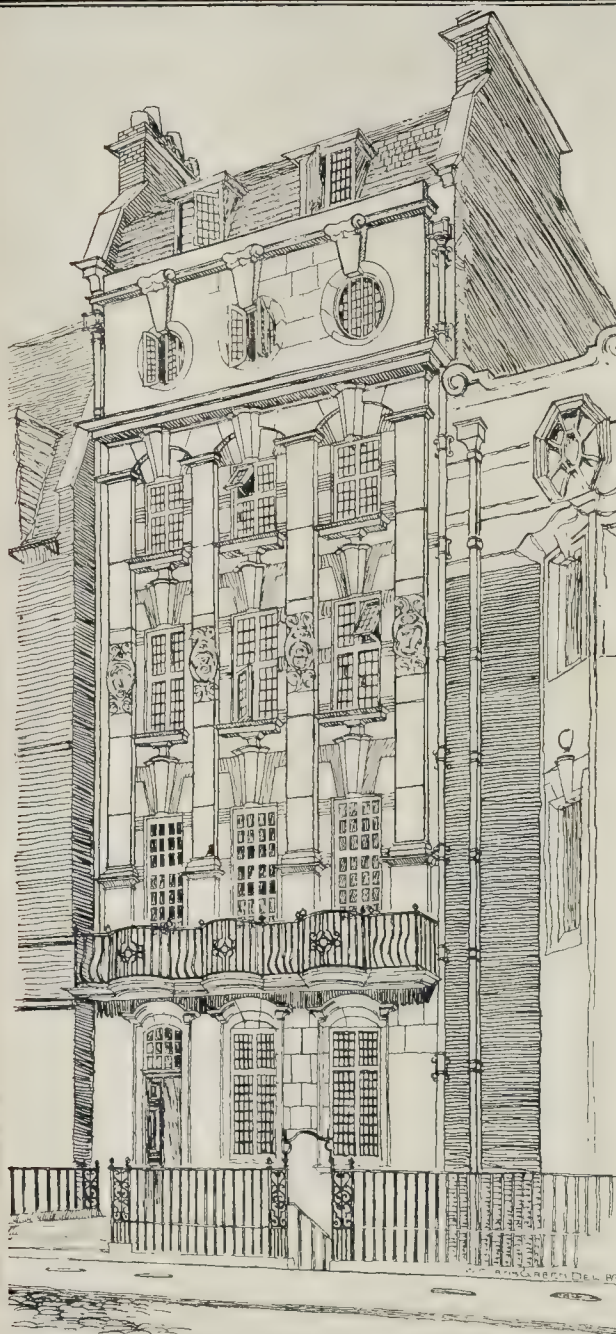
THE SALON EXHIBITIONS AT PARIS.

THE representatives of what used to be the Champs Elysées Salon (the "Old Salon") and those of the Champ de Mars Salon have had a conference and agreed upon the disposition of their respective exhibitions for this year in the "Galerie des Machines" of the 1889 exhibition. The old Salon will take three-fourths of the space, on the side next to the Avenue La Bourdonnais where it will have its principal entrance; while the remainder of the space, next to the Avenue Suffren will be taken by the new Salon. Each exhibition will have a central hall transformed into a garden, for sculpture. The old Salon will be divided up into thirty rooms, the new Salon into eighteen. In the latter the sculpture court will have an architectural erection in the centre reproducing the colonnade of the "Temple des Bains" at Versailles, and intended as a place of exhibition for objects of industrial art. M. Lovoit, the architect, has been commissioned to superintend the arrangements of the rooms for the old Salon, those for the New Salon are in charge of a painter, M. Dubufe.

SIR W. B. RICHMOND'S LECTURES.

THOUGH Sir W. Richmond's fourth Royal Academy lecture, on Thursday the 20th, was announced in the programme as devoted to Giotto's work in the Arena Chapel at Padua, in reality only half the subject was gone through, the remainder being postponed till the fifth lecture, as the lecturer was desirous to characterise the various paintings somewhat in detail, and it was impossible to go through them all in this manner in one lecture. After referring briefly to Cimabue and his influence on Giotto, the lecturer went through the photographs of the subjects representing the Life of Christ, drawing attention to various points both in regard to their composition and expression, and the touches of direct realism, drawn from the painter's observation of the life of his own day, which were to be found in them. In his fifth lecture, on Monday last, Sir W. Richmond continued the subject of the Life of Christ, and referred subsequently to the perhaps still more interesting series of figures symbolical of the Virtues and Vices. In referring to the "Raising of Lazarus," he said that Giotto's realism was as complete, as strong, as Zola's, but pointed to another issue; and no one would dispute the dramatic power he displayed. The painter filled his work with ideas which inevitably bore upon the subject, and he was a literary artist. If painting could not tell a story, words were still more unable to do so. Painting presented ideas; words described them. The art of the Greeks was intellectual as was their literature, but the deepest results of the human heart were not reached by them; they were not reached until man had become aware of his emotions, for love and sacrifice were more enduring than the intellect. In the works they were considering they had the culmination of Christian art. The representation of the Virtues and Vices showed how wide and imaginative was Giotto's range. The imperfections in his work were characteristic of the time in which he lived, but there were no intellectual deficiencies, and his faults were inseparable from his merits. The poetry of Chaucer would lose its charm and individuality if the style were remodelled, and as we accepted the poet, so we must accept the painter; and before we could appreciate the work of the thirteenth century we must throw our sympathies into the art it produced. There was never any mannerism in Giotto's work, which was healthy and entirely human.

BOW CHURCH.—On November 21, 1896, we printed an article upon the proposed demolition of Bow Church, which, it is stated, is now pronounced by Sir Arthur Blomfield to be in an unsafe condition. A committee has been formed, with the Bishop of Stepney as chairman, for restoring the fabric, at an estimated cost of 5,000l. Towards that amount the Ecclesiastical Commissioners have made a grant of 500l. out of the City Charities Fund, the Incorporated Church Building Society give 400l., and the Bishop of London's Fund contributes 400l.; other subscriptions raise the promised sums to a total of 1,200l. The parish contains 6,600 inhabitants, most of them being poor, and many of them are Jews. The church, built in the fourteenth century, and first founded in 1181 A.D., was consecrated as St. Mary's parish church on March 26, 1719.



Sketches of London Street Architecture.—No. XXIII. House in Sloane-street.
Mr. F. B. Wade, Architect.

SKETCHES OF LONDON STREET ARCHITECTURE.—XXIII.

This house, which is No. 64 in Sloane-street, is not a new one, but only refaced with Portland and Blue Pennant stone. As far as street architecture is concerned it is, however, a modern house.

The old window openings as far as the third floor were made use of; above this the windows are new.

The architect was Mr. Fairfax B. Wade, whose object in the design, he tells us, was "to avoid commonplace or monotonous treatment, without declining into 'fussiness.'"

NEW PARK FOR ISLINGTON.—The Vestry of the parish of Islington has voted to pool, for the purpose of laying out the recreation grounds which were recently purchased in the Cattle Market area of West Islington, for the sum of 8,000l.

THE CENTRAL ASSOCIATION OF MASTER BUILDERS.

A DINNER of the Central Association of Master Builders of London was held on Tuesday, in the Blue Salon of the Trocadero Restaurant, Piccadilly-circus, W., to entertain the President and Council of the National Association of Master Builders of Great Britain. The chair was occupied by the President of the Central Association, Mr. W. Shepherd, who was supported by the President of the Royal Institute of British Architects, Professor Aitchison, R.A., the President of the Architectural Association, Mr. Hampden W. Pratt, the President of the National Association of Master Builders of Great Britain, Mr. J. Stevenson Jones, Alderman W. Holdsworth, J.P., Alderman J. Bowen, J.P., Alderman W. Jessop, and Messrs. Thomas Blashill, W. H. Seth-Smith, T. F. Rider, A. Krauss, J. H. Colls, H. H. Bartlett, Frank May, J.P., F. J. Dove, Hy. Holiday, C. A. Hayes, Chas. Wall, Jos. Randall, and others.

The loyal toasts having been honoured, Mr. F. J. Dove proposed the toast of "The Royal Institute of British Architects," coupled with the name of Professor Aitchison. Mr. Dove, who referred to the great improvement noticeable in the architecture of towns, said that the greater the ability of the architect, the greater the pleasure of the builder in carrying out work for him.

Professor Aitchison, R.A., in response, said that in less pedantic times than the present the architect was called the master builder, but he was afraid that most of his hearers would be disinclined to use that title. The architect was the master builder in one sense, but he (the speaker) was afraid he was not in another. It was like Capital and Labour—although they were both joined together, there were sometimes little differences between them, which, in the case of architects and builders, were due to a little want of practical knowledge of work of some architects. Architects liked their own views to be carried out, and those views were not always so clearly expressed as they should be, and that led to some disagreement, and, he was afraid, it was mostly the architect's fault for not making it perfectly clear to others beside himself what his wishes were. Differences between architects and builders arose from a want of a thorough understanding before the work was commenced. In reference to modern architecture in England, we might feel rather proud of the improvements which had taken place, especially in London; and that distinguished French architect, M. Paul Sedille, had said in an account he had written of English architecture, that although, in his opinion, the French carried the day in the design of public buildings, he could not help remarking upon the very great excellence of the subsidiary work in this country; and in conversation with the speaker and the late Lord Leighton, the same critic said that nothing could be more absolutely excellent than English domestic architecture. M. Sedille said he wished he could say the same about our public buildings. He (the speaker) had given a good deal of study to the people of the Renaissance, and he had come to the conclusion that they were, for some reasons, a very superior people to those of the present day; he had never met any one who could be compared with them except the late Lord Leighton. Architecture was looked upon as rather an unnecessary art by a great number of people who did not see its utility to the world. Every one saw the utility of building, and yet architecture was that which raised emotions and sentiments in the beholders. Wealth alone, although it was desirable to possess it, left nothing behind it. Where was all the gold and silver and all the mere wealth of the great empires of Greece and Rome? The only things that remained to show how great a people these were, were their literature, poetry, music, sculpture, (their painting was unfortunately gone), and their architecture, as well as a few medals, coins, and a little jewellery. Surely it was something to know that we could add a certain value to our own country; and this value could be added by architecture. Books, music, jewellery became the property of the whole world, for they could be carried about, but it was very difficult to carry away a building; and so, if one wanted to see certain buildings, it was necessary to go to the particular country in which they had been erected. It was a great deal for an art to draw people from other countries to see it, and surely that gave archi-

capture a claim upon the attention of people in the country in which it was produced. Architecture excited emotions quite different from any other art. The buildings of the Parthenon at Athens were the most perfect buildings ever seen, and the emotions produced by them were unique. And a more striking building than the Pantheon at Rome he did not know, though it was not an extraordinary building to look at outside; not what he would call a very happy architectural effort; but the view from the inside, of the enormous cylinder, covered by the great dome, was magical, and the effect it produced could never be forgotten. Some of the works of the Middle Ages were also very impressive. The art he professed, and which they helped to create, was one which ought to receive very much more attention than it does at the present time. The late Mr. Marks was once asked to a little architectural gathering where he did not know many of the party, and he said to him (the speaker), "I only know you and one or two others, and I was wondering how I should know an architect; and at last I said, 'Well, I suppose he is a sort of cross between a gentleman and a bricklayer.'" The great thing for a man to do was to be good at his work or craft, and he (the speaker) had the ambition to see the architecture of England as much celebrated throughout the world as the works of our other craftsmen. He thought it was generally allowed that better work was done in England than anywhere else, and he should like to feel, before he died, that better architecture could be got also.

Mr. J. Howard Colls then proposed the toast of "The Architectural Association," coupled with the name of Mr. Hampden V. Pratt. He felt very strongly that the architecture of a building should not be attempted by a builder, and that the building of a building should not be attempted by the architect. The present combination was a very happy one, and builders were always anxious to carry out architects' designs to the best of their ability.

Mr. H. W. Pratt, in response, briefly referred to the position and work of the Architectural Association. He was rather surprised that builders did not meet to discuss matters of interest to themselves and to architects as well; and he thought that when subjects of interest to builders were discussed before other societies they would do well to send some of their members to take part, in order that both sides of a question should be heard. He especially referred to a subject which was discussed before the Architectural Association recently, which was of interest to builders as well as architects, viz., "The Classification of Builders' Work," but, though invited to send representatives, no builders were present. The Association was introducing technical education into their classes and their Studio with the sole intention that their students might get some idea of the methods of construction and the handling of tools, so as to enable them to design works with a proper understanding of the difficulties in workmanship. It was a great disappointment to architects when they could not get competent men to carry out their work, and the Association had been doing what they could to induce workmen to take an interest in the work and craft they were brought up to. The technical classes which were being formed all over the country had their advantages, in that they induced young workmen to bring some thought to bear upon their work; but he thought a little too much stress was being laid upon those classes. If technical classes were going to take the place of the apprenticeship system, it would be a great mistake. The apprenticeship system was suffering on account of technical education, and he thought that technical education could not take the place of apprenticeship in the trades, nor of pupillage in the architect's office. The only way to master a trade was to start as an apprentice and go through it from the beginning. Architects who desired to see their work carried out well realised that a good education ought to be given to young men, and they looked to master builders to help young men to get that education, and to take an interest in their work.

The Chairman, in proposing the toast of the evening, "The National Association of Master Builders of Great Britain," said that the Council of the Central Association had much pleasure in welcoming the National Association to London. They had had in the engineering trades dispute an object lesson that all of them

should take to heart. However much they might desire to put off the evil day, he had long seen that the building trade would have to go through very much the same crisis as the engineering trades had, unless some change could be brought about by other means. The value of an association of employers of labour had been made patent to them. The object of the National Association of Master Builders was not a belligerent one. They had not formed associations of masters throughout the country because of a desire to fight the men who did their work, but they had been driven to do so because of combination on the part of the men, and if there had never been combinations among the men there never would have been among the masters. Some people thought that the primary object of the Association of Master Builders was for the purpose of getting an undue profit, but that was not so. If there were a little less selfishness on the part of some builders they would be able to form a much stronger Association, but the individual interests of some men prevented them from seeing the larger interests which ought to unite men in the attainment of a common object. Some builders seemed to think that when they had little difficulties with their men the Association should step in and relieve them of their troubles; but where the Association could act was when most of them were threatened and affected. The value of Associations like their's was that when difficulties occurred the interests of the members would be looked after by a representative body. He quite agreed with Mr. Pratt that technical schools could never be a substitute for the old apprenticeship system. Having regard to the conditions under which builders carried on their business, the opportunities of an apprentice for getting a general knowledge of his trade and technical education were restricted, and technical education was useful in giving those opportunities; for in the technical school a boy was supposed to be taken over the whole ground of his trade, whereas in learning his business as an apprentice he might be kept to some particular work that he showed an aptness in. So far, technical classes served a useful purpose, but, as far as builders were concerned, if the apprenticeship system could be re-introduced they would be saved from many of their worst troubles, for what they suffered from was incompetent and untrained men, who, having allied themselves to a trade society, had to be accepted as competent men. It was the duty of all builders to take a proper number of apprentices, and those who did not do so were helping to make trouble in the future. But, apart from that, every builder who had apprentices bound to him would be able to carry on his business in a small way in the event of trouble with the men. There was a want in London and, no doubt, in the provinces also, of well-trained plasterers and bricklayers, and every possible means should be tried to alter that state of affairs, and there was no reason that he could see why boys who were trained in industrial schools to make brushes and shoes should not receive training as plasterers and bricklayers. He did not think that any particular distinction ought to be made between society or non-society men, but it was in the interests of all of them that the non-society man—the man who preferred to be unfettered—should not go to the wall, and he hoped that the engineering employers would see that justice was done to those men who had served them in their difficulties. A man under discipline was five times more the man than one who was not.

Mr. J. Stevenson Jones, of Liverpool, the newly-elected President of the National Association of Master Builders, in the course of his response, said that he hoped that the principle of the Association would always be kept in mind, viz., defence, not defiance. The building trade was the largest industry in the country, paying in wages over 1,000,000, a week. Trades-unions were a necessity to the working men to protect their legitimate rights, but when these rights were pushed too far, employers were compelled to start counter-combinations. There was a boast that we live in a free country, but there was no genuine freedom when a man was not allowed to work for whom he liked, for as long as he liked, and for what he liked. Trades-unionism of thirty years ago was a very different thing from trades-unionism of to-day. Trades-unions to-day were federated together all over the country, and that gave them an enormous

power, and they now presumed to interfere in the management of the employers' works and in the freedom of employment. This was forcing local associations of builders into district federations, and it was hoped, those federations would become in time part of the National Association, and so would help both masters and men, for such a combination would tend to prevent strikes and lock-outs.

Mr. T. F. Rider, past President, also responded, and said that during the course of his two years' presidency he had tried to make the National Association a power in the land, and he was glad that the Association had adopted his suggestions in regard to forming local associations. In regard to apprenticeship, in that lay the remedy for the scarcity of men in the various branches of the trade. The National Association had no objections to trades-unions; they preferred them to undisciplined men, but employers objected to interference in the conduct of their businesses, and if their Association was to be what its name implied, they must work together and declare that never would they allow any one to interfere in the conduct of their affairs; that they would carry on their businesses to the best of their ability, not caring whether their men did or did not join any union; and that every employer should be the master of his own business.

Mr. C. Wall then proposed "The Provincial Associations," coupled with the names of Alderman Holdsworth and Alderman Bowen, both of whom replied.

The other toasts were "The Chairman," proposed by Mr. J. C. White, and "The Visitors," proposed by Mr. Holloway and responded to by Mr. Thomas Blashill.

THE SURVEYORS' INSTITUTION:

SURVEYORS AS ARBITRATORS.

AN ordinary fortnightly meeting of this Institution was held on Monday evening, in the temporary premises of the Institution, Savoy-street, Victoria Embankment, the President, Mr. Christopher Oakley, occupying the chair.

The minutes of the last meeting having been read and confirmed,

Mr. Alfred A. Hudson read a paper entitled "Surveyors as Arbitrators," in the course of which he said that there is nowadays a strong feeling in favour of arbitration and technical tribunals, but it was as well to consider the advantages and disadvantages of the different tribunals for settling building disputes. The method of trial which every litigant was entitled to, unless he had debarred himself by agreeing to refer to arbitration, was by a judge of the High Court or by a judge with a jury. This right, however, when the action involved the prolonged examination of accounts, was merely a right in name, for by the rules of court it was provided that such actions should be referred to one of the official referees. But whether the trial was by a judge in the High Court or by an official referee, the same rules of procedure applied. In cases of great detail the examination and cross-examination of witnesses to the extent which the parties were entitled to, to elucidate the truth, would last a much longer time than any judge could give to the case. The result, therefore, was that either the judge refused to try the case, or it was so curtailed as to render the trial almost a compromise at the request of the judge. There was a great difference between trials in the High Court and trials before an architect or surveyor. In the High Court a judge was bound to consider every witness *prima facie* as a witness of truth, whereas in private arbitrations many a witness was known to the arbitrator, and the weight which he attached to such evidence depended upon his personal knowledge of the witness. In the case of professional witnesses, it seemed to him no wonder that a judge was obliged sometimes to express his dislike to building cases owing to the inexplicable differences between the witnesses on one side and the witnesses on the other. Whereas if a surveyor had been arbitrator, he would soon have accounted for the differences, either by his personal knowledge of the witnesses called, or by little matters which occurred in the evidence which would pass unobserved except by a trained technical mind. It was for the litigants to decide which tribunal they preferred. The Corn Exchange and other mercantile bodies had rules for the settlement of disputes amongst themselves, and it might well be that many a member would prefer to have a trial where his

way of doing business was less known. As to the expenses of trial in the High Court, so much depended upon the amount in dispute whether such trial was economical or not in proportion to the amount claimed. The judge did not receive any fee from the litigants as in the case of an arbitrator, but there were other expenses which did not occur in arbitrations. Speaking generally, he thought that if an arbitration were conducted in a legal manner before an arbitrator the expenses were in excess of a trial in the High Court, either by a judge or by an official referee. The most important element of expense and disadvantage of trials in the High Court was that the parties could not arrange the date of trial at a time convenient to themselves, and so, in the adjournments from time to time, the parties were equally at a disadvantage. While an arbitrator was always willing to meet the convenience of the parties, the parties must, by the necessities and rules of the High Court, wait the convenience of the judge. The chief disadvantage of trial in the High Court, which applied to all trials of technical matters by non-technical tribunals, was that, as often happened, neither judge nor counsel understand the details of building or engineering work. It was the experience of those who were concerned in these cases that they were either won or lost by small matters. It was therefore the complete mastery of detail which, in nine cases out of ten, lead to success, and this knowledge could only be acquired and the facts of a case understood by those who had a technical training. In reference to the trial of building disputes by surveyors and architects, the author assumed, in the first case, that the arbitration was to be conducted in a judicial manner. No difficulties arose as to a knowledge of technicalities, but even this method of trial had its disadvantages, for there were not many surveyors or architects, except some old hands at arbitration work, who were able to cope with the objections of counsel or feel in a position to decide legal points. The laws of evidence were not an easy subject for a lawyer, and still less so for a surveyor, and upon the improper reception or rejection of evidence all the time spent in the arbitration might be thrown away and the award set aside. In this kind of arbitration the parties should choose, therefore, a strong arbitrator, that was to say, someone who had the force of character and ability to dispose of the objections of counsel, either by proposing to adjourn to take legal advice, with a suggestion that he had a discretion as to costs, or by some other method of dealing with the legal difficulty. To obviate this state of affairs a legal assessor was often engaged to sit with the arbitrator, but such a course just doubled the expense. The converse of this case was for a barrister to sit as arbitrator with a surveyor or architect as assessor. He did not know whether any preference would be given to either method. Much depended upon the qualifications of the arbitrator and assessor in each case. In effect, such arbitrations generally resulted in the arbitrator and assessor being joint arbitrators. With regard to the kind of professional man suitable for the settlement of building disputes, there was a common practice in building contracts to appoint an architect as arbitrator, sometimes by name and sometimes merely by entering into the form of contract prescribed by the Royal Institute of British Architects, in which case the arbitrator was nominated by the President of that body. The Royal Institute of British Architects had a perfect right to stipulate in their conditions that an architect should be arbitrator, because the members of that body represented building owners; and architects, being nearly always employed by the building owner, had a natural bias, incident to their position, in favour of the person who generally employed them. The Royal Institute of British Architects, therefore, in appointing architects as arbitrators, did what anyone else would do, and chose the arbitrator most likely to favour their side of the disputes. But he did not think for that reason that it was the best tribunal which could be chosen, and in the same way he should say that anyone who regularly obtained employment from builders was equally unsatisfactory as an arbitrator between builder and building owner. The professional men who should be appointed as arbitrators were those who as often acted for the builders as for the building owner. They then had opportunities of freeing their minds

from one-sidedness. Surveyors were particularly fitted to settle disputes about building matters where the claim was really one of the value of work done. Architects, on the other hand, by the subdivision of practice which has taken place in recent years by the employment of quantity surveyors, were gradually becoming less and less proficient in the details of prices. In fact, by many members of the Royal Institute of British Architects he thought it was claimed that it would be unprofessional to consider detailed prices, or to do anything savouring so much of business. It became necessary, therefore, where an architect was appointed arbitrator in such cases, to agree, if possible, that questions of prices and value of work should be determined by a surveyor or valuer. Failing such agreement, the arbitration would be greatly prolonged, and each party would have to call evidence as to hundreds of measurements and prices which one person could easily and quite satisfactorily settle. When he was an architect, both as a pupil and afterwards, he recollected the predominant idea was to keep extras down. Now that he was at the bar and saw the builder's side of the question, he knew there was another way of looking at matters, and that was to keep extras up. There was no use in blinding oneself to the fact that the building owner was in a very safe position when he made the architect's decision final, but if he wished to avoid all chance of litigation he would be in a still safer position if he provided that all matters in which the architect's decision might be claimed not to be final an arbitrator of his own naming should decide the matter as a condition precedent to any claim. The author then referred to arbitrations in which neither counsel nor solicitors appear, and these, he thought, where the nature of the case admitted of such method of trial, were the best which could be devised in the interests of the disputants. Instances of this kind of arbitration occurred under the London Building Act. The most frequent example of this kind of arbitration was where the architect, engineer, or consulting engineer of any work was appointed arbitrator to decide disputes between the builder and the employer. This kind of arbitration was not always a desirable one for the builder or contractor, but the method of decision was certainly expeditious and simple. Litigants wanted (1) their case understood by solicitors, counsel, and the judge or arbitrator; (2) as a rule a decision on their strict legal rights; (3) the time of trial they required to be made to suit their business engagements; (4) they wanted all this done as economically as possible, and they expected to get, which they never did, their reasonable costs. Dealing with the last point first, one of the greatest grievances which builders had was that by no manner of means could they recover what they were entitled to, even if they obtained a verdict for the full sum claimed. This arose owing to the fact that there were two scales of costs, one between party and party, and one between solicitor and client. Suppose a builder—for it was generally builders who were suing for payments alleged to be due to them, the building owner rarely suing except it be for damages for defects or for penalties—had obtained a verdict for a sum of money. The party and party costs were taxed, and the builder was allowed a proportion only of the expenses he had had to incur, in solicitor and client costs, in proving his claim. The balance of his expenses he had to pay himself. Although this affected all litigation in the High Court, it bears much more hardly upon litigants in building and technical cases than in any others, because the detail to be dealt with was so great and the evidence required was so expensive to obtain. It did not seem to be understood by taxing masters that the expense of qualifying expert witnesses to give evidence could not be avoided, and therefore should be allowed. Suppose, for instance, a contractor was suing for work and labour done, and the claim he made was for 1,000l., the balance of 10,000l. The quantity surveyor might be required to measure up the whole work, and the charges he would necessarily have to make to a builder could not be under 150l., or 1½ per cent. but more probably 200l. The answer which a taxing master would very likely make would be that the builder must make out his account himself, and perhaps would in consequence disallow the whole of this charge, and so would he deal with the greater part of the necessary professional evidence. The other wants of litigants would be better considered by seeing how the

Admiralty Court did its work. This was a technical tribunal, which he believed gave great satisfaction to all those concerned in such cases, and by analogy it would be seen how suitable such a machinery would be for disposing of building disputes. In this Court the dates of trial are fixed in advance, so that a litigant knew the day when his case would come on, and the registrar in fixing one or two cases for the day had regard to the probable time they would occupy. In the Admiralty Court the judge sat either by himself or with two assessors, or with a jury, whichever was asked for, usually, however, with assessors. The assessors are members of Trinity House; one must have been in the merchant service and the other in her Majesty's service. These assessors are paid for by the litigants, the scale of fees being determined by the rules of court. The judge never inquires into the amount due to either side if disputed. He simply determines liability, and the question of amount is left to the registrar, assisted by two merchants. They hold a little court in one of the rooms of the Law Courts, and the registrar afterwards draws up a report which is confirmed or not by the judge. This was a very simple procedure; all the officials were accustomed to the matters coming before them, which were more or less of the same description, and the things worked admirably. The obvious comment was, if the convenience of litigants could be considered in one court why should it not be considered in other courts. Further, the evidence in the Admiralty Court was shortened very much because no evidence was allowed to be given of an expert character within the knowledge of the assessors. Besides this, if the judge was not satisfied with any evidence, he might send the assessors down to inspect the vessel, and even to experiment so as to arrive at a conclusion as to the matter in dispute. Now, if there were a court of this kind for the trial of building matters and all allied subjects, everything in fact in which the technical evidence of surveyors, architects, or engineers was necessary, the court would have more than it could do apart from all the matters which were now and would be then referred to arbitration. In order to draw a comparison between the Admiralty Court and a Building Court, it would only be necessary to substitute surveyors, architects, and engineers, according to the nature of the case, for the members of Trinity House, and surveyors, valuers, and quantity surveyors for the settlement of amounts before the registrar. England was far behind Scotland in technical tribunals; in fact, except for the Tribunal of Appeal under the London Building Act, the jurisdiction of which was very limited, there was no technical tribunal at all in England which deals with building matters. But nearly every chief town in Scotland had for generations had its Dean of Guild Court. This court had jurisdiction to settle disputed boundaries, light and air, and all matters relating to plans for buildings and buildings themselves. The court was composed, for instance in Edinburgh, of ten members, three of whom it was provided should be persons carrying on, or who have carried on, business as architects, civil engineers, or ordained surveyors, or master builders. Three members of the court to form a quorum. This court, though no doubt effective in Scotland, was not so adaptable to English requirements as the principles on which the Admiralty Court were worked, but it afforded evidence that technical tribunals were and had been found very useful in Scotland, and by analogy might be found very useful in England. Mr. H. H. Collins, in proposing a vote of thanks to the lecturer, said, that the paper opened a great many controversial matters. He should send round copies of the paper with the object of deterring builders from going to arbitration or to law, although he was satisfied with arbitration himself. Referring to the Building Act, which he thought was more sweeping than necessary, he thought that the result confirmed his prophecy that the alterations were not so desirable in practice as in theory. One of the causes of delay not mentioned by the lecturer was that caused by the absence of counsel. The arbitrator might be willing to go on, but Mr. So-and-So could not be present, and so the court must adjourn. In regard to the opinion of the lecturer, that architects might be one-sided because they were appointed by the owners, he thought the same might be said of surveyors as they were employed by the landowners, or quantity

surveyors because they were employed by the builder. But happily there were single-minded men—men who had the honour of the profession at heart.

Mr. Chatefield Clarke, in seconding the vote of thanks, said he thought it would be well if the suggested Technical Tribunal could be formed, to which all building cases could be referred. In regard to the appointment of architects as arbitrators, he thought the architect, being trained, would be more likely than any other man to see the points. Where he thought he would fail would be in the want of a legal assessor, and he would favour a court with an architect coupled with a lawyer for all light and air and similar cases. No doubt the Dean of Guild Court worked well in large Scotch towns, where all dangerous structure and Building cases were settled by it.

Mr. J. Douglass Mathews, in supporting the vote of thanks, said he thought the lecturer was rather hard on architects, and had taken a view different to that held generally. The architect held a position between the client and the public, and he thought others were far less likely to do justice. It was not necessary to refer the dispute to an architect appointed by the President of the Institute of Architects. One or two architects should be appointed, and if not settled by them the President of the Institute should appoint an architect, but the arbitrator should delay this until the parties had failed to agree. He, the speaker, could not agree with the lecturer, that architects were horrified at extras, although, of course, like most people, they did not like them, and he did not think quantity surveyors would be so good as arbitrators as architects were. He thought the court suggested, like the Admiralty, was a good one, and it would be more satisfactory for litigants to come before such a court.

Mr. W. W. Woodward said that he thought every effort should be made to create the proposed tribunal. The Tribunal of Appeal was satisfactory, expeditious, and cheap. The Building Act was to be amended, and he trusted that the Tribunal of Appeal would receive increased powers. It was specially necessary that a tribunal should be created in light and air cases.

On the motion of Mr. P. E. Pilditch the discussion was adjourned until the next meeting, on February 7.

THE LONDON COUNTY COUNCIL.

THE London County Council resumed its sittings on Tuesday at the County Hall, Spring Gardens, Dr. Collins (Chairman) presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Hampstead Vestry 5,900*l.* for paving works and additions to the vestry hall; the Lewisham District Board 18,225*l.* for sewerage and other works; the Wandsworth District Board 4,000*l.* for paving works; the Holborn Union 8,400*l.* for the erection of a laundry and for alterations and additions to the Mitcham School; and the Poplar Guardians 15,560*l.* with which to purchase schools.

The Works Department.—A special return was issued by the Finance Committee on the Works Department, being a statement of the whole of the estimated works commenced, completed, and certified, and of jobbing works certified since the change in management in December, 1896. It showed revised estimates amounting to 14,347*l.*, actual cost, 10,681*l.*, amount of saving 3,665*l.* On jobbing works the schedule value was 25,308*l.*, and actual cost 23,150*l.*, a saving of 2,158*l.* The total saving was 14½ per cent. The Works Manager reported with regard to the Boundary-street works, where the difference of cost below the estimate was 2,995*l.*, that the chief causes which enabled so large a saving to be effected were that, in consequence of other works being carried on within the same area, and of the works under consideration overlapping each other in point of time, they were able to employ the same foreman, timekeeper, watchman, &c., on these as on other works, and by that means to save largely in wages each week, and they had the further advantage of retaining the services of men who had become accustomed to their requirements. The necessary plant was already on the spot for other works upon the same area, and on completion the plant was left for further work at the same place; therefore, practically all the carting of plant, which would have cost a large amount, had been saved; this would not have

been the case had the work been carried out by a contractor. The same advantages operated in the provision of water supply, lighting, and watching. The other works which this department was carrying out formed a partial protection, and they already had a quantity of hoarding on the ground, so that very little expense was incurred in this respect. They were also able to make use of the existing temporary sheds for cement, mess-rooms, stores, &c., without incurring the expense of specially providing them. Had the department not had other works going on upon the same area, the saving would have been much less; but, on the other hand, had a contractor been employed for this work, the Council would not have benefited by these advantages. The department purchased some of the principal materials required at a much lower price than the current market rates. Those in immediate charge of the work performed their duties in a very satisfactory manner, and much of the success might be attributed to their care and attention. The Council would effect considerable economy if works were carried on continuously, keeping the staff, plant, and men uninterruptedly employed.

The Earl of Hardwicke moved that this return should be omitted from the reception of the report, because he considered it of questionable value.—Mr. Goulding, M.P., seconded the motion.

Mr. Hoare defended the return, pointing out that now the Works Department was better able to carry out the work assigned to it, the best way in which they could contrast the work of the Department with the contractors' was that they should obtain Parliamentary consent to compete with contractors for the work of the School Board and other public bodies.

Sir John Lubbock, M.P., said he looked to the general results. The defence offered by the Progressives seemed to be that now they had got rid of an incompetent Committee, people who did not understand their business, they would be able to do better under a new manager. Mr. Hoare's suggestion amounted to this: that, having failed to save money for the ratepayers, they should now undertake to do work for other public bodies.

Mr. McKinnon Wood said the failure of the Works Committee was due to the fact that the Unionist members joined that body with the view of wrecking the Department.

The Earl of Onslow said they had had a most careful inquiry into the accounts of the Works Committee, and he could not find in that inquiry a tittle of evidence that the Moderate Party intended so to damage the Works Committee as to show a loss. The Moderate Party wished to prevent a further loss to the ratepayers.

Mr. John Burns, M.P., defended the Works Committee generally. He held that the action of the Moderate Party had caused contractors to put up their tenders for work to be done for the Council.

After further discussion the motion was withdrawn. From the report of the Finance Committee submitting half-yearly statements of works executed by the Department up to September 30, 1897, we take the following remarks:—

"The Council will see from the explanations of the manager, which the Committee present, that in Mr. Adams' opinion a considerable portion of the various excesses of cost over estimate is explained by the fact that the estimates accepted by the department were too low. If this is the case, it points to a risk which should be borne in mind. There may be a temptation to the Works Department in the first instance to make a low estimate in order to secure full employment for their staff, but the manager should understand that the Committees and the Council will hold him responsible, if, on the out-turn of the work, there should be reason for thinking that such has been the case. If this risk be not guarded against, the Council may find itself carrying out, through its Works Department, work which, if put out to tender, might have been undertaken by a contractor at a lower figure than the cost as executed by the Works Department, or which the Council might not have undertaken at all, if it had known the amount of expenditure involved. With reference to the five works which show large excesses of cost over final estimate, we desire to make two observations, first, that at any rate during some portion of the time during which these works were in course of execution the Works Department was undergoing investigation, which was followed by considerable changes in the staff; and secondly, that the present manager is not responsible for these

works as they were practically completed before his appointment on February 2, 1897. We have received a report from him upon the general management and organisation of the department, which we append for the information of the Council. With regard to the "schedule value" of the jobbing works executed during the half-year to September 30, 1897, we may state that the General Purposes Committee are considering whether the schedule in force during this period is a proper one."

Report from the Manager of the Works Department referred to above:—

"In presenting to the Committee my reports on the completed works which have been reported by the Comptroller or rendered by the Acting Works Accountant since the changes made in the organisation of the Works Department, it, perhaps, is desirable to offer some general remarks upon them. The reports have been presented separately to the various committees, but it might be convenient to the Finance Committee to have them in some connected form, and for this reason I include all reports upon cost of works presented since my taking control of the department within the period above-named. It has been difficult to arrive at a true judgment as to the cause of a cost in excess over the estimate, where such has been the case, in those works completed during 1896 and the early part of 1897, but I have endeavoured to the best of my ability to give an impartial statement in each case where a deficiency has occurred. Perhaps I should point out that some works, although only recently reported, were executed during 1896, previous to my having control of the department, and others were so far advanced that it was not possible to effect any improvement before they were completed. On the other hand, there have been errors of judgment and defects in the organisation which must have been accountable for some portion of the losses in two or three instances. I have endeavoured to remedy this, and have largely reorganised the general working of the department. Work which formerly it had been customary for the department to put out to tender, is now done by our own men at a large saving. The joinery machinery has been overhauled, and a large amount of bench work saved. Old materials, which were obstructing the premises, and which there was no prospect of using, have been disposed of. Second-hand timber, which was stacked in a haphazard manner and could not, therefore, be got at for use, has been restacked, and nearly the whole used up in works requiring such material. Timber stocked at the docks, incurring heavy charges for rent, has been removed to our own premises. Plant and materials were lying in confusion, owing to the recent completion of the new buildings in the central yard and the Battersea wharf, which have now been arranged in an accessible manner. Certain cartage which was formerly done by contract is now done almost entirely by our own horses, thus keeping our own men and horses fully occupied, so far as the work in hand will allow, and utilising our own wharf instead of paying for the use of others. The stores have been re-arranged, so that the storekeeper is responsible for the whole instead of the various shop foremen having sub-stores. The staff has been considerably reduced, and other expenses curtailed. Other alterations have been made, but these will sufficiently indicate our present position. The result of all this is shown by the cost of the works commenced and completed since the change in management, which in no single instance has exceeded the estimate. We cannot, of course, hope that we shall be as successful in every work, any more than a contractor would be, but there is no doubt that we shall reap a large benefit from these improvements during the coming year.—W. ADAMS, manager."

The Council next discussed the adjourned reports upon works completed by the Department in the half-year ended March, 1897. Excess votes were passed to cover losses amounting to 2,236*l.*

In the course of this report the following particulars are given in regard to the history of the schedules:—

"(1) *Architectural Works and Repairs.*—The Council's schedule of 1895 is a document containing 4,361 prices of different kinds of work and materials founded on the schedule of the School Board of 1894. The Board invite tenders every three years from builders, stating the percentage above the schedule at which they would contract with the Board for jobbing work. The accepted tenders are at somewhat varying rates in different parts of London, but the average of them in 1895 was about 11 per cent. above the schedule. The Council, however, considering that the Works Department were under the disadvantage of doing all jobs from one centre, resolved to allow an additional 1½ per cent., making altogether 12½ per cent. above the schedule. This constituted the Council's standard for April 1, 1895. Owing to the rise in wages following the builders' strike in 1896, this standard was increased by 2 per cent., as from June 1 of that year. The "schedule value" of these works is therefore based upon an addition of 12½ per cent. to the School Board schedule for the period from April 1, 1895, to May 31, 1896, and of 14½ per cent. from June 1, 1896, to March 31, 1897.

(2) *Engineering Works and Repairs.*—These were valued upon the standard schedule of the late Metropolitan Board of Works with certain additions. With the exception of a few alterations, the schedule contains the same standard prices as those upon which tenders used to be invited from contractors. The contract prices for these works in December, 1890, were 3 per cent. above the schedule for the northern division, and 4 per cent. above the schedule for the southern division. Two years afterwards, the contracts were renewed for six months with a further addition of 4 per cent. in both cases, *i.e.*, 7 per cent. on the north side of the river, and 8 per cent. on the south side of the river, or an average of $7\frac{1}{2}$ per cent. The General Purposes Committee recommended the Council on July 9, 1895, to allow an addition to the schedule of 10 per cent., and stated in their report that the reasons assigned by the late Works Committee for the increase of an average of $2\frac{1}{2}$ per cent. on the charges of the last contractors were (1) that since the last contract was entered into on January 1, 1893, the Council had laid down a schedule of hours of labour and rates of wages which contractors had to adopt, and which were, of course, observed by the Works Department; and (2) that these works, which extend all over London, are carried out by the Works Department from one centre, whereas, when done by contractors, London was, for the purpose of these works, divided into two districts. With regard to the addition of 10 per cent. the Chief Engineer stated, in his evidence before the Special Committee, that he recommended the acceptance of this 10 per cent., because he felt sure that at that time, under the regulations applying to rates of wages and hours of labour, the Council were not likely to obtain a lower quotation from outside firms. Owing to the builders' strike of 1896, a further addition of 2 per cent. was allowed by the Council as from June 1, 1896. The valuation, therefore, represents an added percentage of 10 for the period from April 1, 1895, to May 31, 1896, and of 12 for the period from June 1, 1896, to March 31, 1897.

3. *Boarding and Shoring Works.*—The prices paid to the contractors for this work in June, 1891, were 64 per cent. below the schedule then in force; the prices were raised 64 per cent. under the resolution of the Council of November 15, 1892; that is to say, to the actual schedule rates without any deduction or addition. This schedule formed the Council's standard of April 1, 1895. For the period from June 1, 1896, to March 31, 1897, these works were valued at an enhanced price of 2 per cent., owing to the builders' strike.

For works completed in the half-year ended September, 1897, excess votes were proposed to cover losses amounting to nearly 18,000*l.*

Upon the reception of the report,

Mr. Burns said the department was doing well now that a stop had been put to the machinations of the Moderate party.

Mr. White said the alleged profits were to a large extent imaginary, and the Progressives were catching at any crumb of comfort which they could discover. However, the Moderates had no reason to grudge the Department such small measure of success as it had achieved, inasmuch as the Works Committee had been abolished, and the political element in the controversy had thus been removed.

The reception of the report having been agreed to,

Mr. Boulnois, M.P., then moved the adjournment of the Council.

Mr. Cohen, M.P., seconded the motion.

Upon a show of hands the motion was rejected, and no division being called for, the consideration of the excess votes was proceeded with; and they were agreed to without further discussion.

The Council adjourned at a quarter past seven o'clock.

Illustrations.

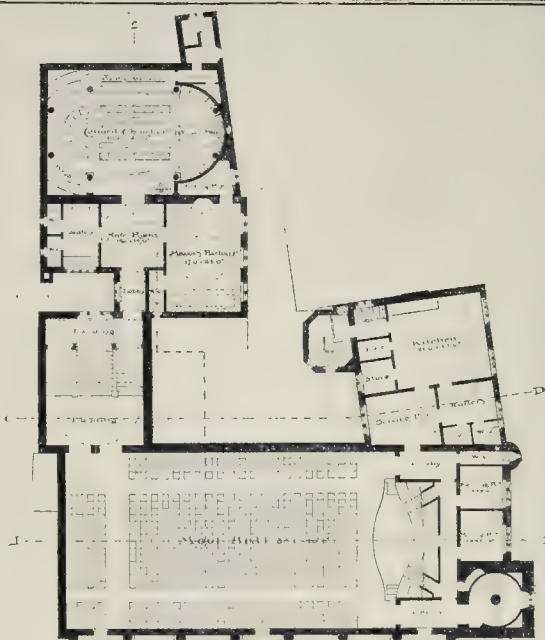
DESIGN FOR A BISHOP'S THRONE.

WE have no information from the architect, Mr. W. D. Caröe, as to this design, further than that it is for a bishop's throne which was intended as a gift to one of the English cathedrals. The design, however, speaks for itself, and requires no special description.

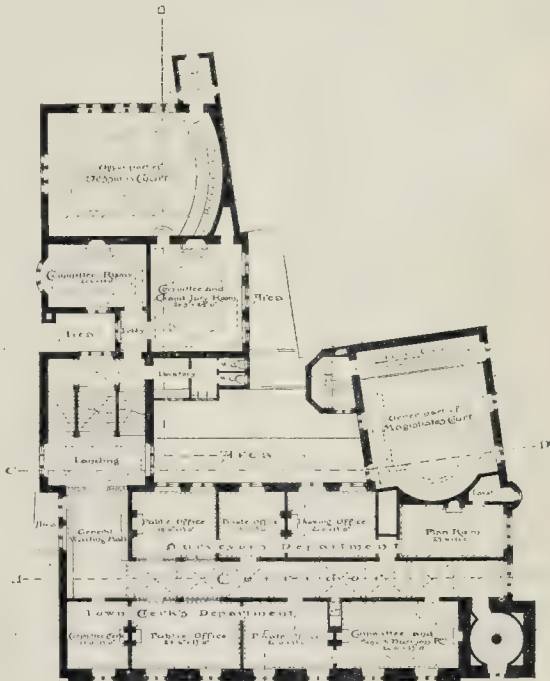
The drawing was exhibited at the last Royal Academy.

COMPETITION DESIGN FOR COLCHESTER TOWN HALL.

WE publish this week Mr. H. T. Hare's design submitted in the Colchester Town Hall competition, of which we spoke, when reviewing the competition, as being probably the best plan submitted, and superior in some points to all the premiated designs.

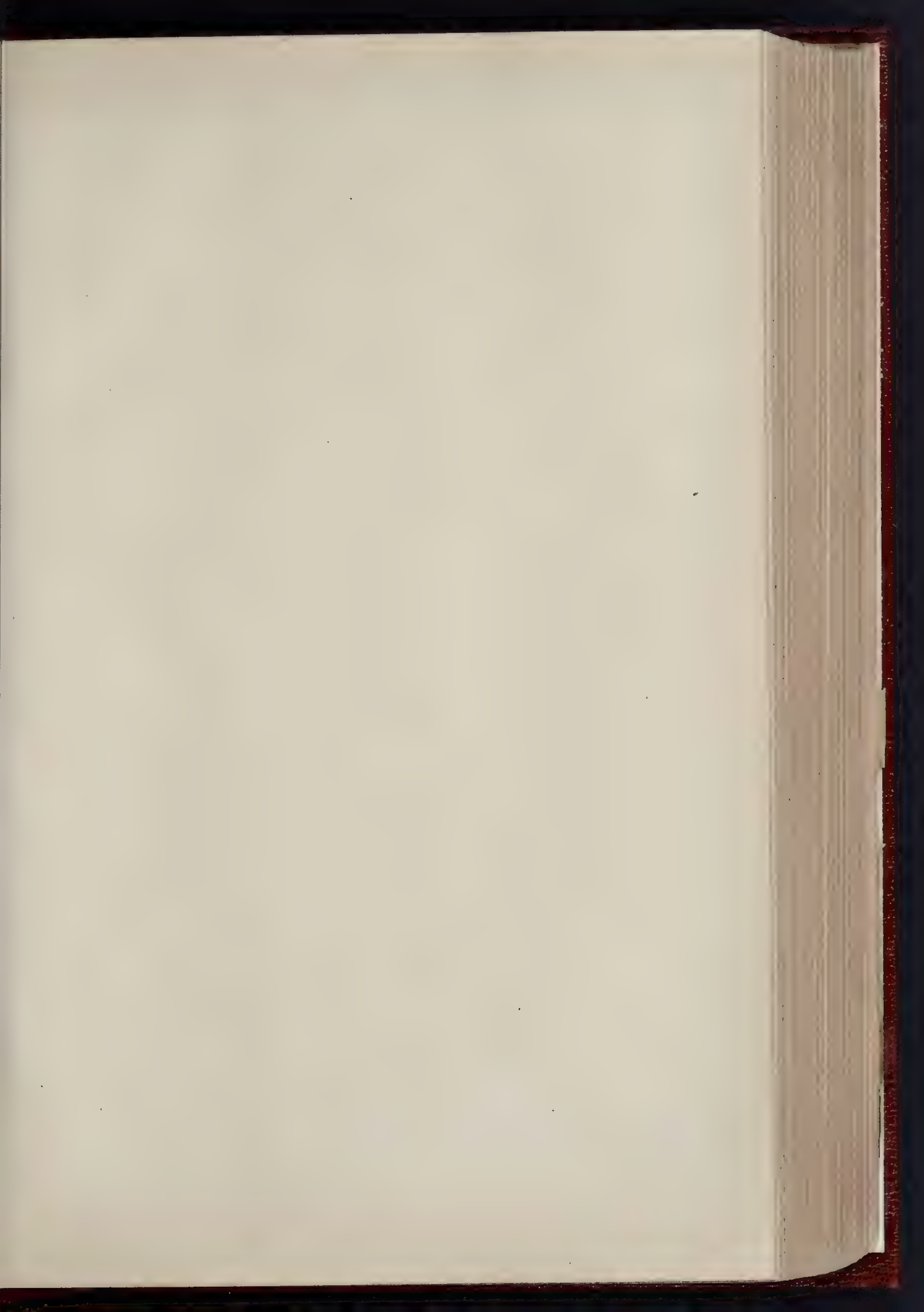


Second Floor Plan.



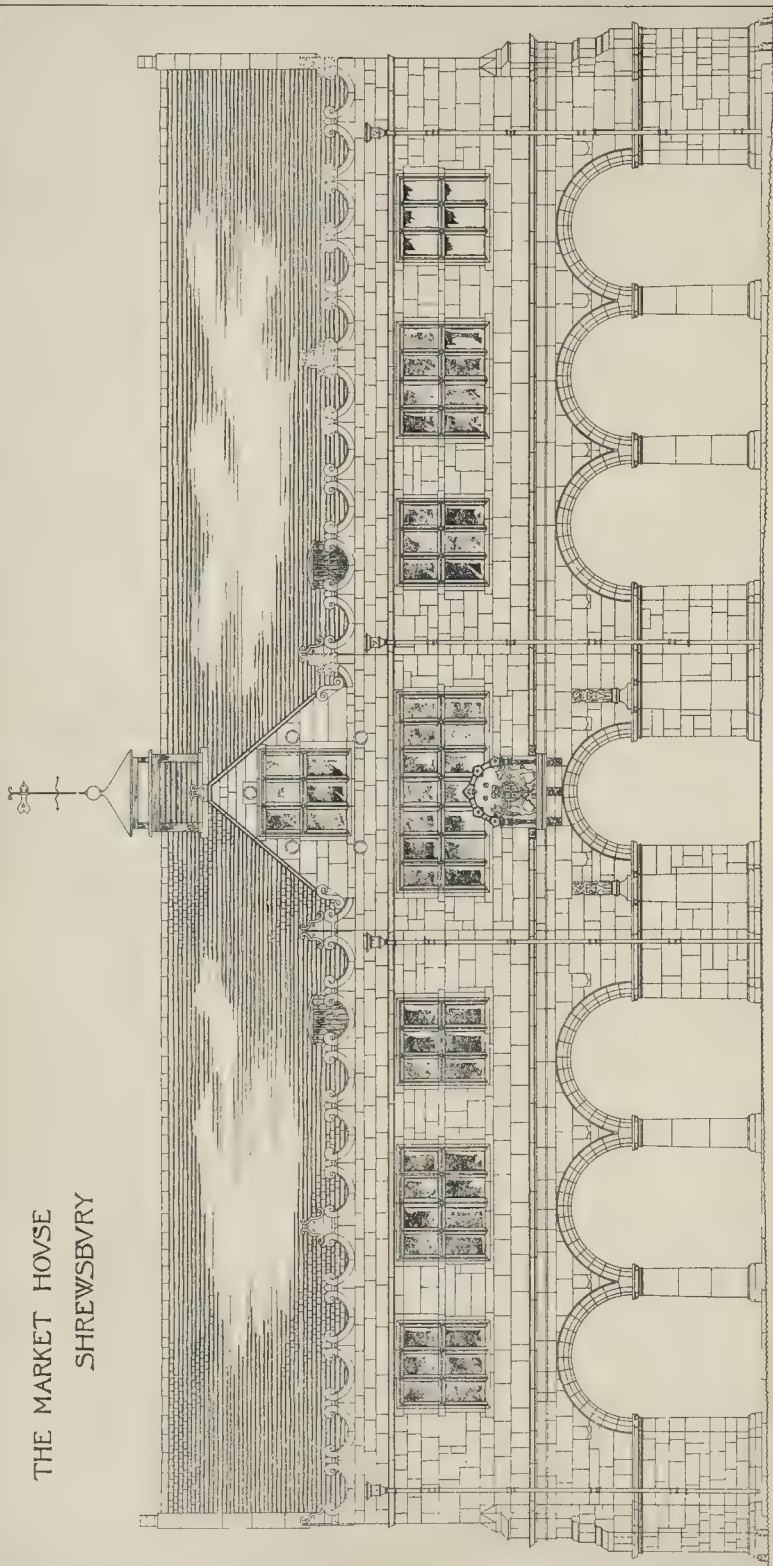
First Floor Plan.

Competition Design for Colchester Town Hall. Plans. (For Ground Floor Plan see lithograph plate.)



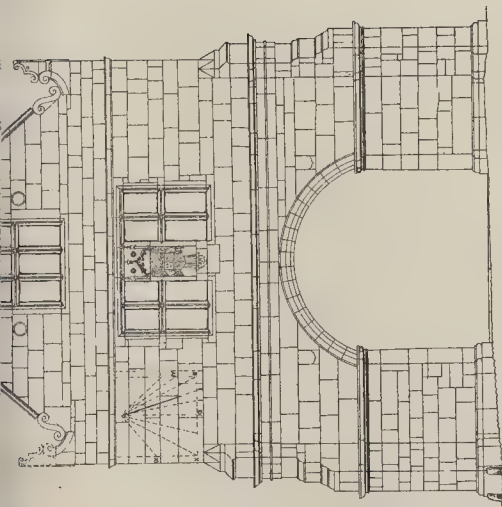
THE BUILDER, JANUARY 29, 1898.

THE MARKET HOUSE
SHREWSBURY

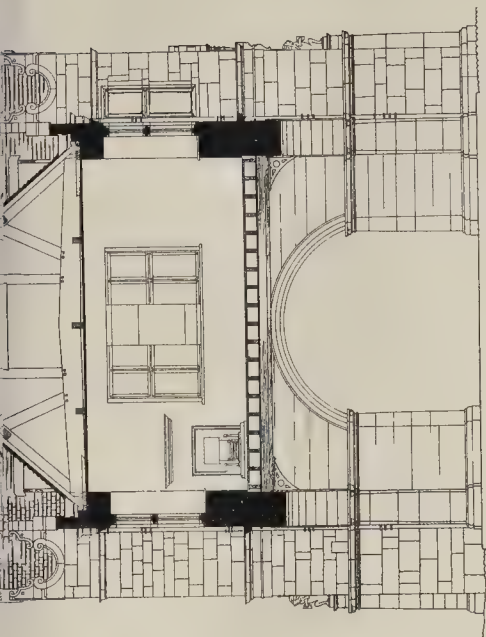


WEST ELEVATION

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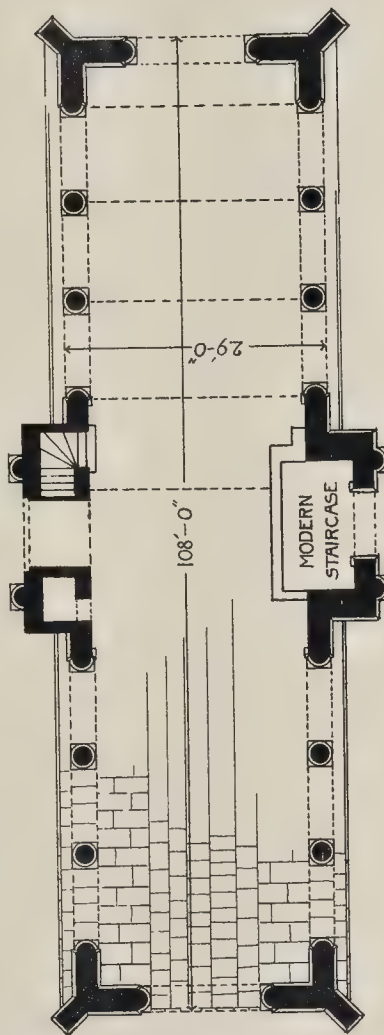


SOUTH ELEVATION



TRANSVERSE SECTION

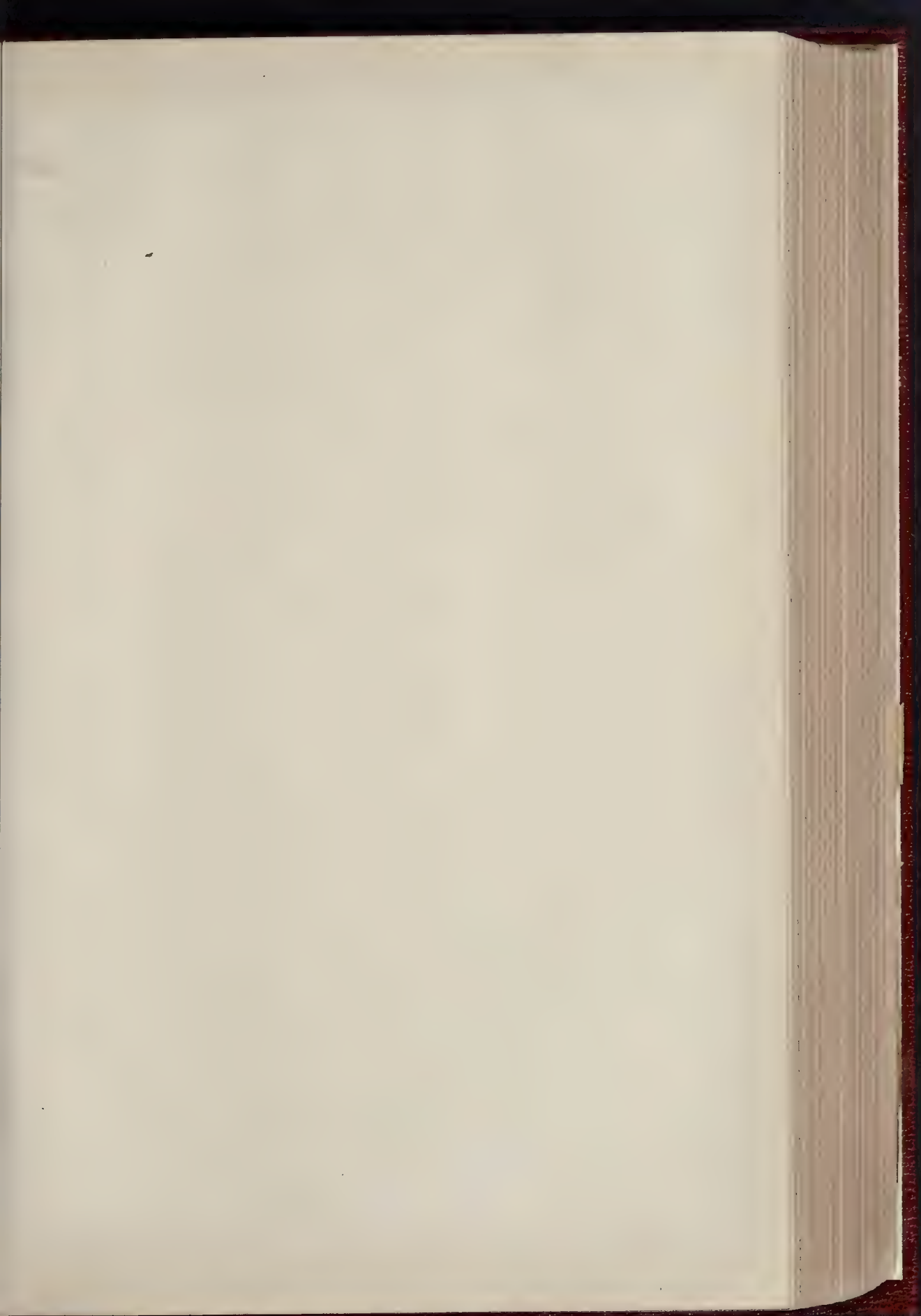
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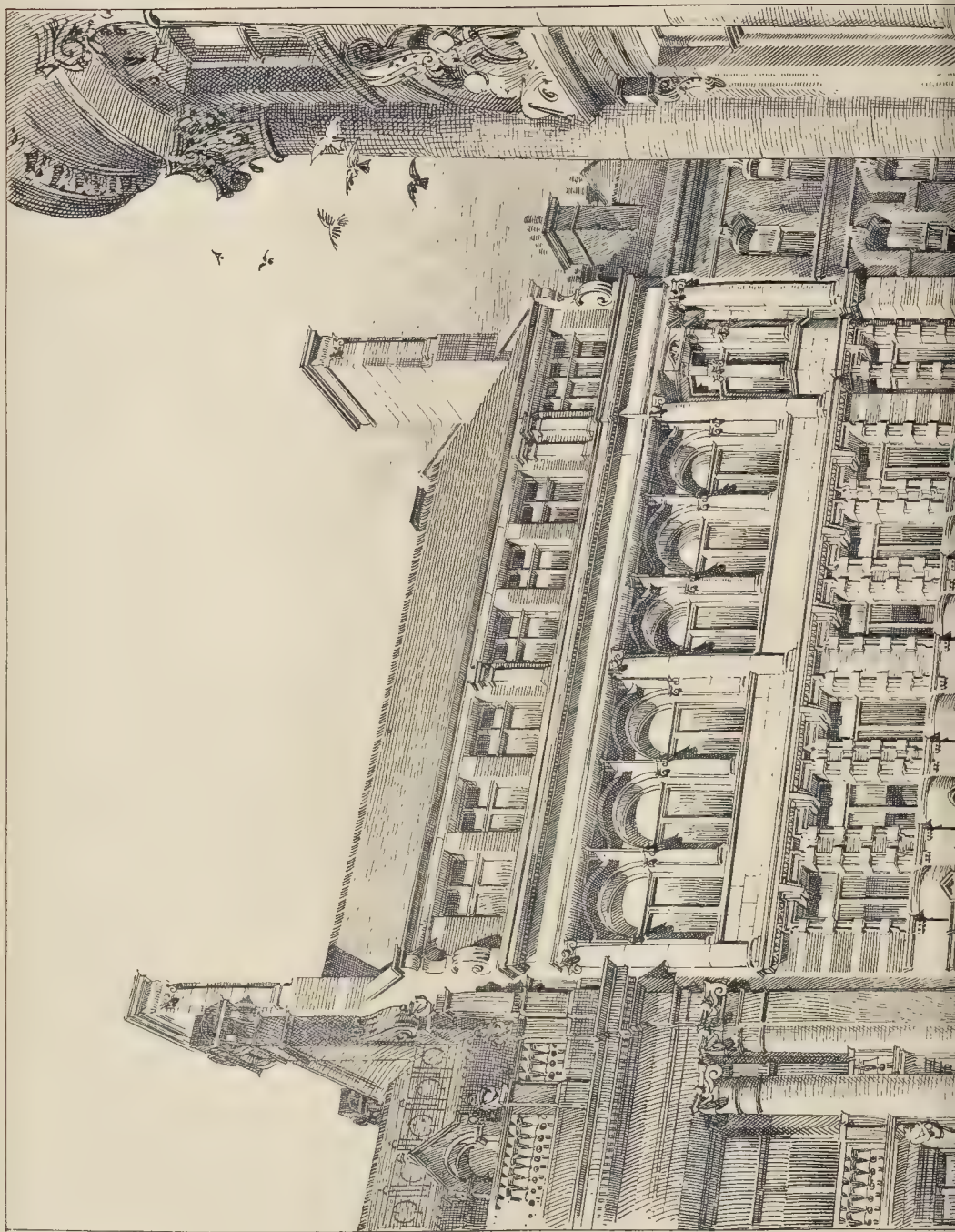


10 20 30 40 50 60 FEET

A. R. KEICHLEY SEPT. 1897

PHOTO LITHO SPRAGUE & CO. 435 EAST HARDING STREET PEPPER LAKE, I.C.

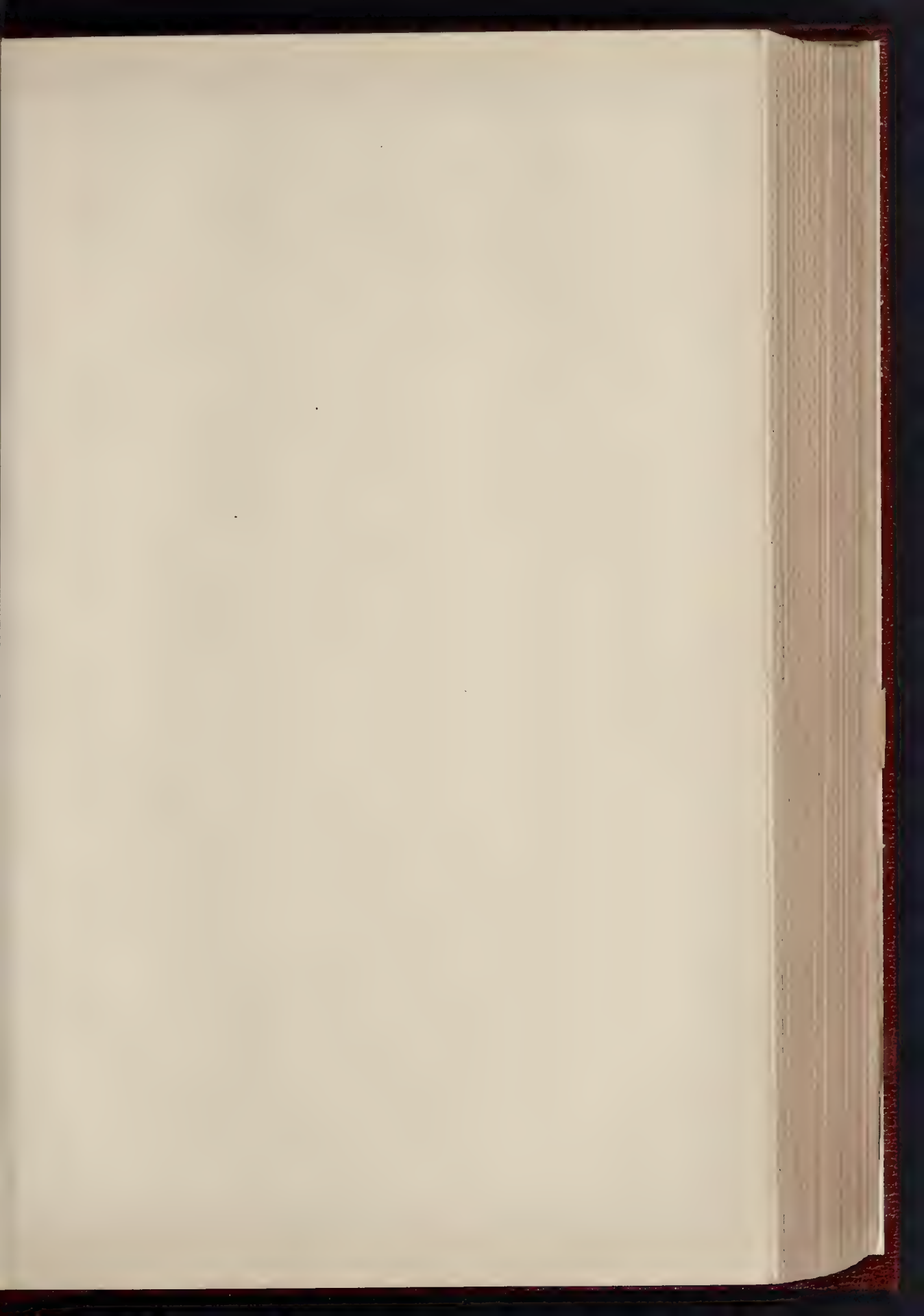






NEW · PREMISES · EXCHANGE ST. · MANCHESTER ·

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:BOROVKA or COLCATHART:
 :NEW TOWN HALL:
 :GROUND FLOOR PLAN:

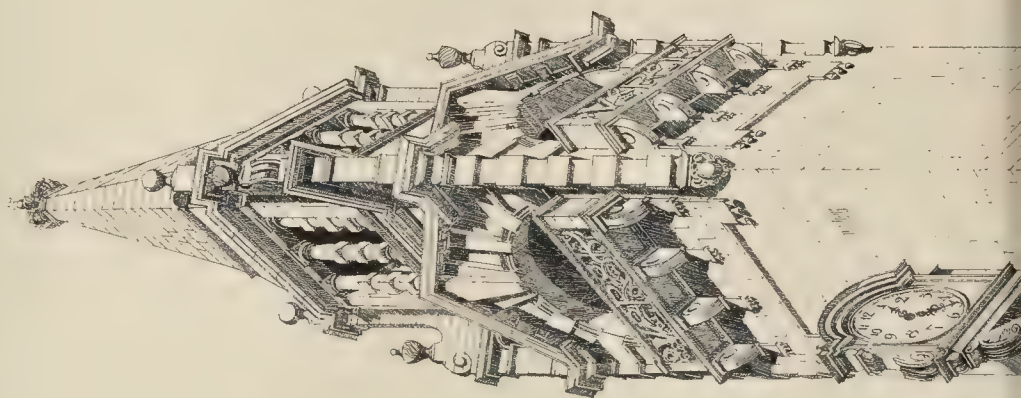
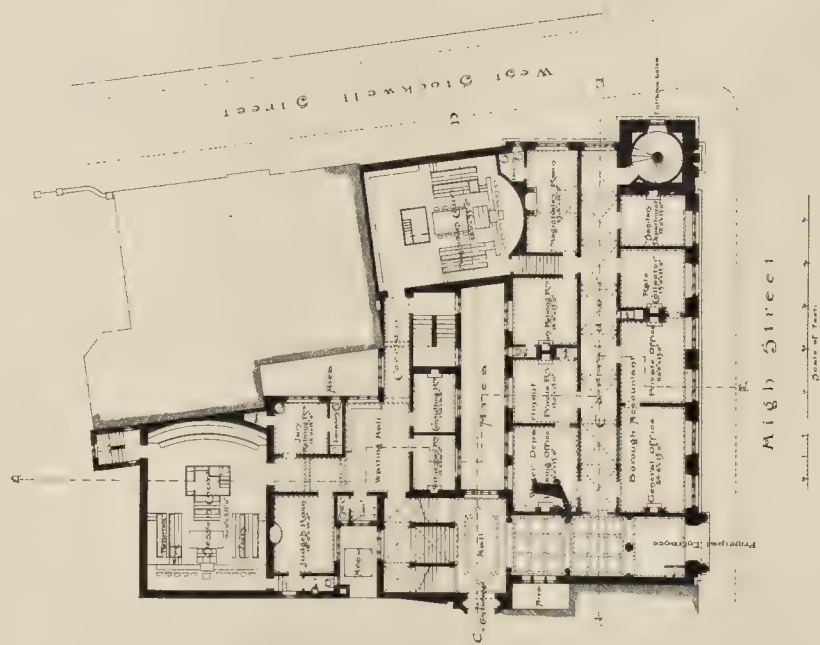
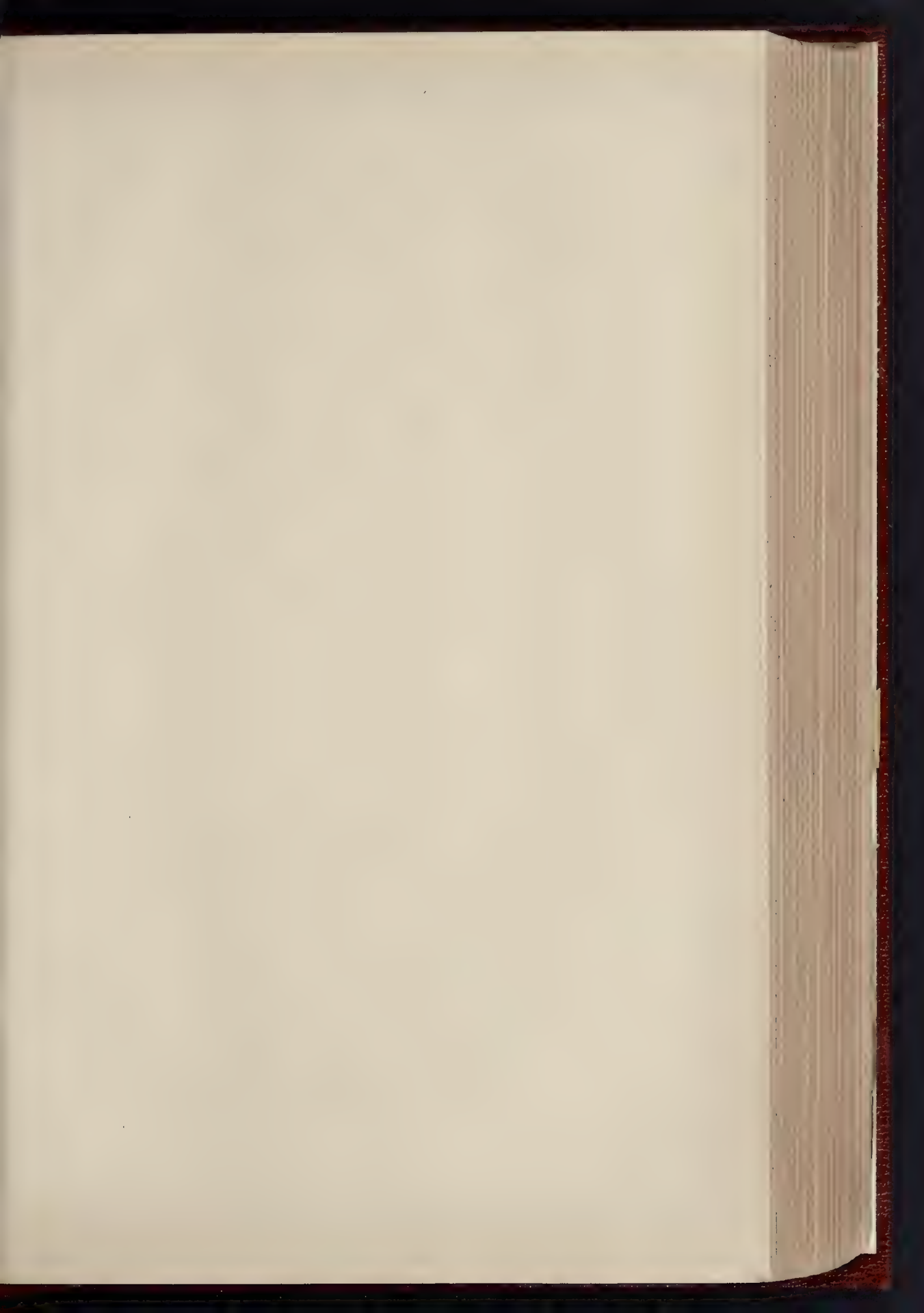


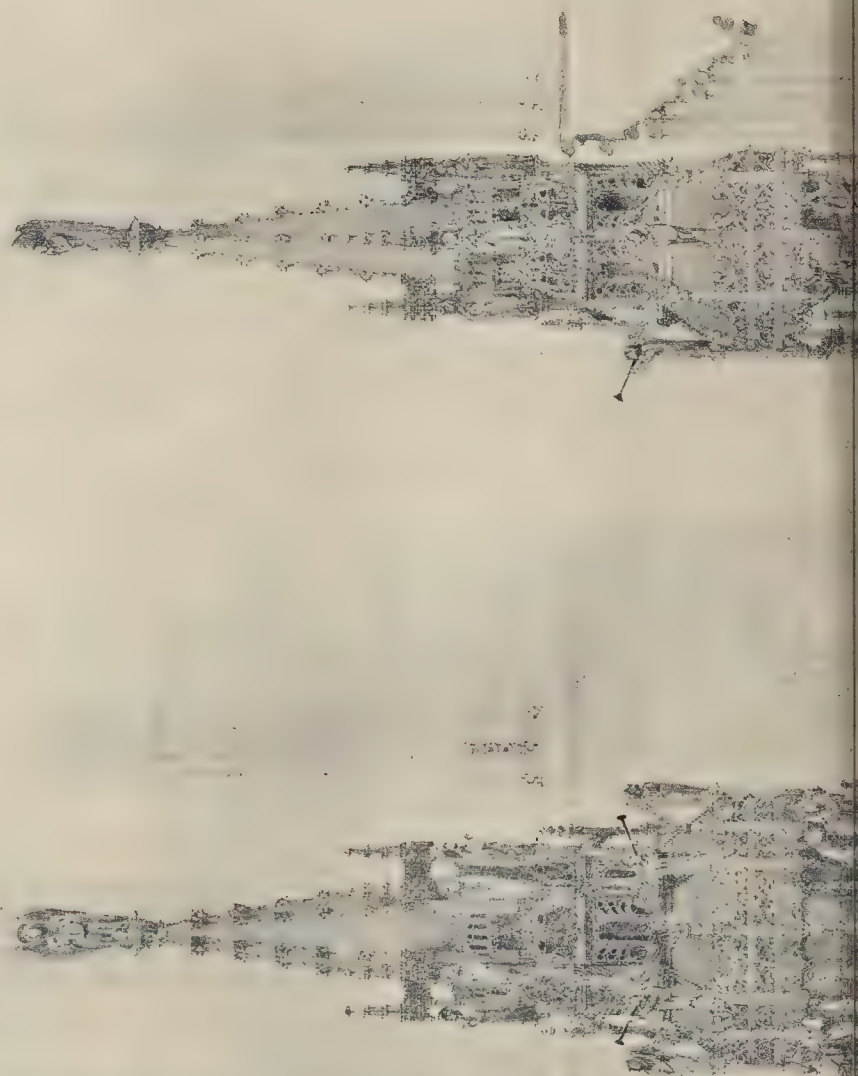


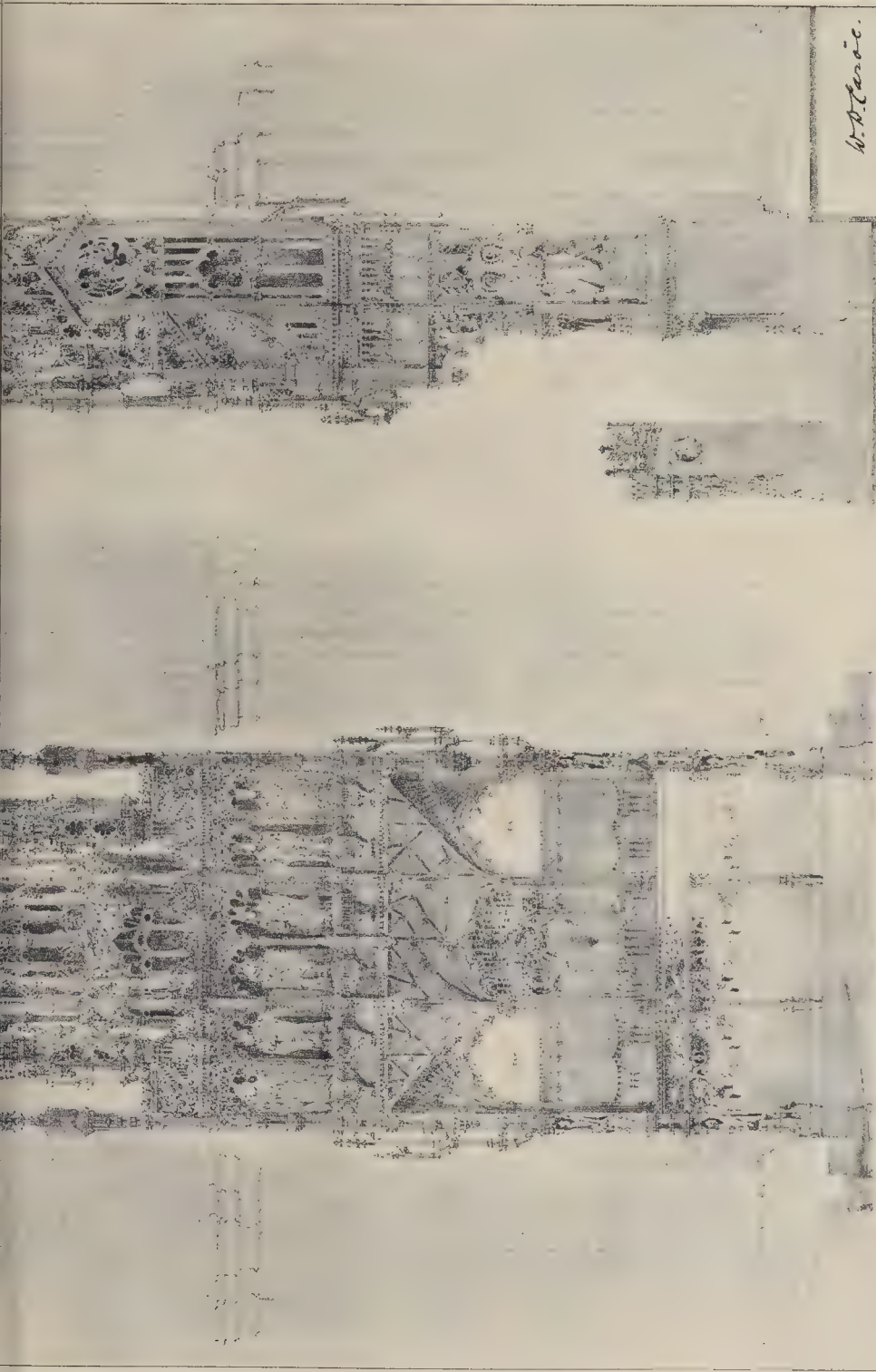
PHOTO LIND SPARKER C. 485 EAST HARDING STREET FETTER LANE E.C.

DESIGN SUBMITTED BY MR H T HARE, A.R.B.A., IN THE COLCHESTER TOWN HALL COMPETITION



LETTERS TO A BISHOP'S THROAT -





W. D. L. 1876

1876

W. D. L. 1876

W. D. L. 1876

W. D. L. 1876

In regard to his intention in preparing the design, Mr. Hare writes—

"The site for these buildings was an exceptionally difficult one to deal with, and was rendered still more so by the fact that the accommodation required was greatly in excess of the legitimate capacity of the area. The principal aim, therefore, in arranging the plan was to minimize the height of the building, while giving as conveniently as possible the accommodation asked for.

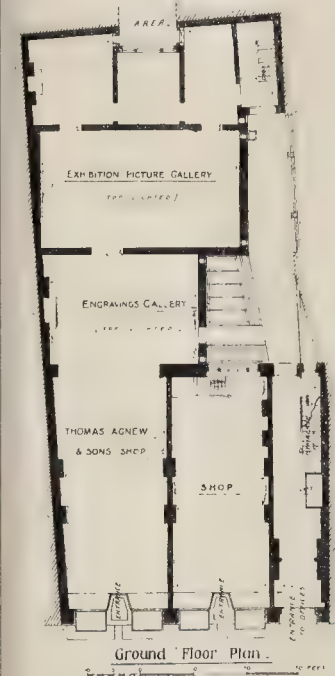
The tower was one of the special requirements, and was intended as a Jubilee memorial. The circumstances of the site appeared to make the corner the most desirable position for it; otherwise it would undoubtedly have been better placed away from the main front, or probably omitted altogether.

The principal front was treated in one unbroken range, and with strongly marked horizontal lines, in order to give length, and to detract from its height.

The materials proposed were Portland stone, with a stone slated roof."

NEW PREMISES, EXCHANGE-STREET, MANCHESTER.

This building comprises shops and offices; but principally picture galleries, on the ground floor in the rear, for Messrs. Thos. Agnew & Sons. The front is being built in red stone



New Premises, Exchange-street, Manchester. Plan.

and red brick, and the roof covered with green slates. The lifts will be put in by Messrs. Archibald Smith & Stevens. The contractors are Messrs. Neill & Sons, and the architect Mr. Charles Heathcote, of Manchester.

THE MARKET HOUSE, SHREWSBURY.

The first corn market in Shrewsbury, built in 1566, was a half-timbered structure, like many others in that part of the country.

In March, 1566, this building being found small and inconvenient, it was decided that it should be taken down, the woodwork sold to the townsmen, and the present market house erected in its place.

The first floor of the new building consisted of one large chamber, which for two hundred years was rented by the Drapers' Company as a market for Welsh fannels.

Below this was the corn exchange, and above

a loft, which does not appear to have been much used, as it has no floor, and is only accessible by means of a ladder.

In 1685 posts were planted between the columns to prevent carriages driving in—a practice which had become a nuisance. In 1719 the corn market was paved with flagstones, and iron railings put up round it; the latter have since been removed. The arms of Queen Elizabeth in the centre of the west front are carved in high relief in stone, and show traces of painting and gilding; they are probably the work of some itinerant band of carvers.

The groups of windows on the east and west elevations are not central with the arches below them, while the cresting is constructed regardless of both.

The curious figure of an angel bearing the arms of England and France which blocks up the central light of the first-floor window on the south elevation was brought from the Castle gate (destroyed in 1825), and did not form part of the original design. On the north elevation a statue of Richard, Duke of York, is placed in a similar position. Decayed pieces of stonework in all parts of the building have been cut out from time to time and replaced with new; this accounts for the very unorthodox jointing to be seen in places.

The roof is of oak of heavy scantling, the tie beam being 18 in. by 9 in. in the centre of the span. There is no ridge piece.

The main principals are placed at an average distance of 14 ft. apart, between them are secondary principals, constructed with a collar and curved braces without a tie beam. The bell turret dates apparently from the eighteenth century; it is made of oak, and on the north and south sides, where there are no louvres, it is covered with lead.

It is noticeable that the arch under the staircase has been placed well out of the centre of the bay in order to clear the steps above.

The northern half of the first floor is now divided up into offices and waiting rooms, the southern half contains the Mayor's Court and private rooms.

A. R. KEIGHLEY.

COMPETITIONS.

PUBLIC OFFICES FOR HEATON NORRIS.—The District Council of Heaton Norris have had under consideration the competitive designs for new public offices submitted by architects, and on the 21st inst. they announced their decision. Having considered the report of Messrs. Royle & Bennett on the various plans, they came to the conclusion that the plans under the motto "Queen Bess," submitted by Messrs. Woodhouse & Willoughby, should be placed first in order of merit; those under the motto, "Auld Lang Syne," by Messrs. Darbyshire & Smith, being second; and those under the motto "Order," by Messrs. Potts, Son, & Pickup, third.

ADDITIONS TO TECHNICAL INSTITUTE, GILLINGHAM.—The plans of Mr. Fredk. Smith, Bank-chambers, High-street, New Brompton, Kent, have been adopted by the Gillingham Urban District Council in a limited competition for extension to their present Technical Institute. The estimated outlay is 1,600*l.*, and the additions will consist of a cookery school, manual instruction room, and three large classrooms.

THE MARGATE JUBILEE MEMORIAL.—A combined meeting of the committee of the Diamond Jubilee Fund and the Cottage Hospital Managers, was held at St. John's Hall, on the 11th inst., to receive the report of the assessor, Mr. Wm. Emerson, on the competitive plans for the enlargement of the Cottage Hospital as a memorial of the Queen's Diamond Jubilee. There were four designs, two prepared by each competitor. In answer to a question, the Chairman announced the estimates given by the architects to their respective plans, as follows: "Rollo" A 1,550*l.*, and "Rollo" B 1,200*l.*, submitted by Mr. W. J. Mercer, "Imperatrix" 1,375*l.*, and "Regina" 1,200*l.*, submitted by Mr. R. Dalby Reeve. After a short discussion it was agreed that the more expensive plan of each competitor could not be considered, and after further debate the following resolution was passed, viz.: "That the committee accept Rollo's plan 'B,' and that the architect be instructed to get out specifications and working drawings, if necessary, and that tenders be invited for carrying out the work."

FIREPROOF FLOORING, PORTSEA HOSPITAL, PORTSMOUTH.—We are informed that Banks'

patent fireproof flooring has been selected in competition for the Royal Portsea Hospital at Portsmouth.

INFECTIOUS DISEASES HOSPITAL, EDINBURGH.—The Corporation of the City of Edinburgh are building a new Infectious Diseases Hospital, which is arranged on the pavilion system. There will be about forty separate blocks, including administrative offices, nurses' home, servants' home, &c. The committee, after an examination of the various schemes of ventilating and warming—mechanical and natural—applicable to the special requirements, decided to have a competition open to all engineers, a premium being offered for the best scheme. A large number of plans have been submitted, under motto, those of "Reputation" being adjudged the best, and the premium awarded accordingly. We are informed that the winners are a Liverpool firm—Messrs. Dargue, Griffiths, & Co., Limited, 15, Lord-street, Liverpool—who have already been instructed to proceed.

ARCHITECTURAL SOCIETIES.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.—A meeting of this Association was held in the Grosvenor Hotel, Dublin, on the 18th inst., when Mr. J. Howard Pentland, R.H.A., occupied the chair, and Mr. Anthony Scott delivered a lecture on Mellifont Abbey. The lecturer dealt exhaustively with the subject of this fine old Cistercian foundation. Like all remains of the kind in Ireland, it is in an almost entirely ruinous condition, but still is full of interest. The chapter house is well preserved. Mellifont is also remarkable for the possession of a unique feature in the form of a detached octagonal building in fairly good preservation, generally supposed to have been the lavabo or baptistry. The lecturer illustrated his remarks by a large collection of measured drawings and sketches made by Mr. Scott, jun. He entered on a comparison and analysis of the plans of Mellifont and contemporary Cistercian abbeys in France. The lecture was further illustrated by a number of lantern views from photographs taken by some of the members on the annual excursion.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The fourth meeting of the session of this Association was held at the rooms in Sackville-street, Piccadilly, on the 19th inst., when Mr. C. H. Compton, Vice-President, occupied the chair. An interesting collection of articles connected with Roman cinerary interments was exhibited by Mr. Earle Way, consisting of a fine cinerary urn, terra-cotta lamps, vases, a tear bottle, and other relics. A fine example of a Celtic bronze coin was found with these remains, which bears on its obverse a representation in relief of the head of a chief, and on its reverse the head of a boar, with circular and half-circular symbols, in resemblance to what is known as ring money. The coin was found with other coins of Nero and Claudius. All these remains were discovered in the course of excavations in the Borough High-street, Southwark, in a line running direct west from St. George's Church to Gravel-lane, Blackfriars, and would appear to indicate the site of a Roman cemetery, to which the dead were brought for cremation from the city within the walls on the north side of the Thames.—Mrs. Collier exhibited a very curious pipe-bowl with carving of Burmese character, but suggestive of European influence, probably derived through the Portuguese. She also submitted a small wooden box of oval form, and apparently of Irish origin, with heraldic carving on the lid, and a shield bearing a harp and surmounted by a crown and supported on either side by quaint animals resembling a lion and unicorn.—Mr. Gould exhibited a series of old woodcuts from an edition of Livy, printed in Strasbourg about 1507. A paper upon some ancient houses near Halifax was read by Mr. W. D. Hoyle, and was full of interesting information concerning the families of Langdale, Lister, Waterhouse, Otes, Drake, and others locally connected with the county of York. The houses described and illustrated were Shibden Hall, Shibden Grange, and High Sunderland, all situated within a mile of the ancient town of Halifax. Shibden Hall is a very picturesque half-timbered house, some portions of which are of fourteenth century work.

In the discussion following the paper Mr. Horsfall of Halifax gave some personal reminiscences of these and other old houses in the locality, and mentioned that early in the twelfth century Halifax was called Holy face.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Bermondsey.—The erection of a one-story building on ground belonging to the London, Brighton, and South Coast Railway Company, on the south side of Alderminstor-road, Upper Grange-road (Mr. C. L. Morgan on behalf of the company).—Consent.

Deptford.—The erection of a one-story shop on part of the forecourt of No. 176, New Cross-road (Mr. J. Webster on behalf of Mr. W. J. Bacon).—Consent.

Fulham.—The erection of a one-story addition at the rear of Nos. 322 and 324, North-end-road, to abut upon Tourney-road (Mr. D. S. Matthews on behalf of Mr. J. H. Margrie).—Consent.

Fulham.—The erection of an entrance-hall to No. 2, Sherbrooke-road (Mr. D. S. Matthews on behalf of Dr. J. Delahunt).—Consent.

Holborn.—The erection of a bank building, with projecting porch, and bay window, on the site of Nos. 1 and 2, Webber-place, Russell-square, to abut also upon Bernard-street (Mr. E. Clodd on behalf of the London Joint Stock Bank, Limited).—Consent.

Hoxton.—The erection of a glass and iron covered-way in front of the Standard Theatre, High-street, Shoreditch (Mr. B. Crewe on behalf of Mrs. Melville).—Consent.

Kensington, North.—The erection of a glass and iron covered-way upon part of the forecourt of No. 54, Kensington Park-road, Notting Hill (Mr. R. A. Briggs on behalf of Mr. H. T. Van Laun).—Consent.

Linthouse.—The construction of an open iron footbridge over High-street, Wapping (Mr. H. E. Jones on behalf of the Commercial Gas Company).—Consent.

Marylebone, East.—The erection of a five-story bay window in front of No. 6, Little Marylebone-street (Mr. T. H. Smith on behalf of Mr. W. Ridding).—Consent.

Strand.—A glass and iron shelter at the entrance to the Hotel Dieudonné, No. 11, Ryder-street (Mr. C. Guiffanti).—Consent.

Wandsworth.—The erection of a one-story library building on the north side of Allfarthing-lane (Mr. H. Branch on behalf of the Wandsworth Library Commissioners).—Consent.

Islington, North.—The erection of four-story bay-windows to proposed residential flats on the south side of Pemberton-gardens, St. John's Park, Upper Holloway (Mr. S. Perks on behalf of the Tufnell and Caledonian Park Syndicate).—Consent.

Levensham.—The erection of twenty-one houses, with one-story shops in front, on the north side of Honor Oak Park, Brockley, between Nos. 36 and Grierson-road (Mr. A. H. Kersey on behalf of Mr. R. Kersey).—Consent.

Marylebone, West.—An iron and glass shelter erected at the entrance to No. 12, Marlborough-place, St. John's Wood (Mr. G. J. Gollidge).—Consent.

Bermondsey.—The erection of a one-story shop upon the forecourt of No. 81, Grange-road (Mr. T. Recknell).—Consent.

Clapham.—The erection of one-story shops on the forecourts of Nos. 109 and 111, Clapham-park-road (Messrs. Wakeford & Sons on behalf of Mr. P. Meredith).—Consent.

Dulwich.—The erection of buildings with bay windows and one-story shops, on the west side of Peckham-rye, at the corner of East Dulwich-road, Camberwell (Mr. A. Keen on behalf of Miss E. Chamberlain).—Consent.

Levensham.—Five three-story houses with shops in course of erection on the west side of Springbank-road, Hither-green. (Messrs. J. Bassett & Sons on behalf of Mr. A. C. Corbett).—Consent.

Marylebone, East.—The erection of bay-windows, porches, and balconies to a proposed building on the site of Nos. 1, 3, and 5, Harley-street, Cavendish-square, at the corner of Wigmore-street (Mr. J. Worley).—Consent.

Peckham.—The erection of a one-story billiard-room at the rear of the Bath Tavern, No. 105, Asylum-road, to abut upon Newbold-road (Mr. C. Ansell on behalf of Mr. H. Lewis).—Consent.

Peckham.—The erection of a one-story shop-front at No. 911, Old Kent-road, Camberwell (Mr. J. H. Waterworth on behalf of Mrs. M. A. Chalk).—Consent.

St. George, Hanover-square.—The inclosure of the arch in front of No. 65, Brook-street (Mr. A. H. Atwater on behalf of Mrs. C. A. Haig).—Consent.

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

St. George, Hanover-square.—The erection of projecting porticos in front of Nos. 21 and 22, Grosvenor-street (Messrs. Balfour & Turner on behalf of Dr. J. Walker).—Consent.

St. Pancras, West.—The erection of a one-story addition upon the forecourt of the "Railway Tavern," No. 35, Chalk Farm-road (Mr. G. J. Thorpe on behalf of Mr. T. E. Medley).—Consent.

Wandsworth.—The erection of an iron and concrete footbridge to connect warehouses on the north and south sides of a public passageway leading from Sayer-street to Lion-street, New Kent-road (Mr. J. W. Brooker on behalf of Mr. F. J. Rodgers).—Consent.

Westminster.—The erection of an oriel window at the first and second floor levels, between the one-story shops at St. James's Park station, York-street (Mr. H. L. Florence on behalf of the Metropolitan District Railway Company).—Consent.

St. George, Hanover-square.—That no order be made with respect to the erection of a verandah in front of No. 12, Charles-street, Berkeley-square; and that the solicitor do discontinue the proceedings directed to be taken in the matter.—Agreed.

Dulwich.—The erection of a one-story addition on part of the forecourt of the "Lord Palmerston" public-house, No. 101, Maple-road, Penge (Messrs. Watney & Co., Limited).—Refused.

Fulham.—The re-erection of buildings on the north-east side of Fulham-road, between the one-story shop at the rear of No. 569, Fulham-road and Moore Park-road (the Vestry of Fulham).—Refused.

Lewisham.—The erection of five houses on the north side of Catford-hill with the flank of the easternmost house to abut upon Beechfield-road (Messrs. Phillips & Norfolk).—Refused.

Woolwich.—The erection of an inclosed porch in front of Bonnie-Blink, No. 255, Eglington-road, Plumstead (Mr. J. O. Cook on behalf of Cavalier L. Zavertal).—Refused.

Greenwich.—The erection of a block of model dwellings on the south side of Trinity-street, Blackheath-hill (Great London Property Company, Limited).—Refused.

Dulwich.—The erection of one-story shops upon part of the forecourts of Nos. 46, 48, and 50, Beckenham-road, Penge (Mr. W. T. Farthing).—Refused.

Dulwich.—The erection of one-story offices upon part of the forecourts of Nos. 20 and 28, Beckenham-road, Penge (Mr. E. W. Harris on behalf of the London and County Banking Company, Limited).—Refused.

Dulwich.—The erection of one-story shops upon part of the forecourts of Nos. 34 and 36, Beckenham-road, Penge (Mr. J. W. Martin).—Refused.

Fulham.—The erection of one-story shops upon the forecourts of Nos. 663, 665, and 667, Fulham-road (Mr. D. S. Matthews on behalf of Mr. F. W. Potter).—Refused.

Hackney, South.—The erection of buildings on the south side of Lea Bridge-road, eastward of Thistlewaite-road (Messrs. F. Chambers & Son on behalf of Messrs. Longbourne, Stevens, & Powell).—Refused.

Hammersmith.—The erection of a house, with one-story shop in front, on a site next No. 278, Uxbridge-road, to abut also upon Armingier-road (Mr. J. H. Richardson on behalf of Mr. W. Cubitt).—Refused.

Hamstead.—The erection of buildings on the north-east side of High-road, Kilburn, to abut also upon Kilburn Priory-road (Mr. W. Stair on behalf of Mr. A. C. Lillies).—Refused.

Hamstead.—The erection of a house with a projecting bay-window and porch, and of stabling with covering yard adjoining, on the west side of Fringal, at the corner of Arkwright-road (Mr. R. C. Edwards on behalf of Dr. J. R. Day).—Refused.

Kensington, South.—A glass and wooden conservatory on the roof of the portico in front of No. 15, St. Mary-Abbotts-terrace, Kensington-road (Messrs. Weedon & Shrimpton on behalf of Mrs. Hamley).—Refused.

Lewisham.—The erection of one-story shops on the west side of Bromley-road with the flank of the southernmost shop to abut upon Aitken-road (Mr. G. Tolley on behalf of Mr. J. Watt).—Refused.

Lewisham.—The erection of a house with shop on a plot of land on the south side of No. 13, Crofton-terrace, Brockley-road, to flank upon Hazeldon-road (Mr. E. Tompkins).—Refused.

Strand.—The erection of a glass and iron shelter in front of No. 28, Haymarket, St. Martin's-in-the-Fields (Mr. F. T. Verity on behalf of the Civil Service Co-operative Society, Limited).—Refused.

Westminster.—The erection of one-story shops on the forecourts of Nos. 96, 98, 99, 100, 101, 102, 103, 104, 106, 108, 110, 112, 114, 116, 118, 120, and 122, Victoria-street (Mr. C. Fruen).—Refused.

Westminster.—That Mr. G. Baines be informed that his application on behalf of Mr. G. Martin for consent to the erection of an open portico to a block of residential flats on the north-east side of Carriage-place, Victoria-street, and of oriel windows with balconies at the first, second, third, and fourth floor levels of two blocks of flats on the north side of Francis-street, between Carlisle-place and Morphet-terrace, having been further considered, the Council sees no reason to depart from its decision of November 30 last refusing the application.—Agreed.

Fulham.—The erection of a two-story store-room at the rear of No. 672, Fulham-road (Mr. G. De Wilde on behalf of Mr. D. Thomson).—Refused.

Hackney, South.—The erection of a one-story shop upon part of the forecourts of Nos. 18 and 20, Mare-street (Messrs. J. H. and H. E. Jones on behalf of Mr. J. Peyton).—Refused.

Hackney, North.—The erection of a block of residential flats, with one-story shops in front, on the west side of Albion-road, Stoke Newington (Mr. H. P. Drew on behalf of Mr. W. Page).—Refused.

Hammersmith.—The erection of a glass and iron covered-way in front of Hammersmith Town Hall Brook-green-road (Mr. J. H. Richardson on behalf of the Vestry of Hammersmith).—Refused.

Islington, South.—The erection of glass and iron covered ways at Collins's Music-hall, Islington-green (Mr. E. A. E. Woodrow).—Refused.

Islington, West.—The erection of an addition on part of the forecourt of Parkhurst Theatre, No. 401, Holloway-road, at the corner of Parkhurst-road (Messrs. Truefitt & Watson on behalf of Mr. J. R. Perfect).—Refused.

Paddington, North.—The erection of a theatre on the site of Nos. 212, 214, 216, 218 and 220 Harrow-road, to abut also upon Westbury-road and Ranelagh-road (Mr. F. Matcham on behalf of Mr. R. Arthur).—Refused.

St. George, Hanover-square.—The erection of an overhanging glass and iron hood at the entrance to No. 25, Park-lane (late No. 7, Great Stanhope-street) (Mr. C. E. Sayer on behalf of Sir E. Sassoon, Bart.).—Refused.

Woolwich.—The erection of a one-story shop upon part of the forecourt of No. 35, Lakeland-road, Plumstead, at the corner of Tewson-road (Mr. M. Goldstein).—Refused.

Width of Way.

Hamstead.—The erection of a two-story building, to be inhabited by persons of the working class, on the west side of Streatley-place (formerly Brew-house-lane), Heath-street (Mr. C. R. Hancock on behalf of Mr. H. Marnham).—Consent.

Poplar.—The erection of a one-story building at the Atlas Chemical Works, West Ferry-road, at less than the prescribed distance from the centre of a footway known as Millwall (Messrs. J. & S. F. Clarkson on behalf of Messrs. J. B. Lawes & Co., Limited).—Consent.

Rotherhithe.—The erection of a two-story workshop and office at Dinorwic Wharf, Rotherhithe-street, at less than the prescribed distance from the centre of the road (Mr. E. Searchfield on behalf of Messrs. J. Williams & Co.).—Refused.

Battersea.—That no order be made with respect to a deviation from the plans sanctioned on February 23 last, on the application of Mr. J. D'Oyly on behalf of Mr. S. H. Wame, for the erection of an addition to the "Surrey-Hounds" public-house, No. 99, St. John's Hill, at less than the prescribed distance from the centre of Plough-terrace; and that the solicitor do discontinue the proceedings directed to be taken in the matter.—Agreed.

Deviation from Certified Plan.

Strand.—That Mr. H. W. Wakley be informed with reference to his application on behalf of Messrs. Reid & Co., Limited, for the sanction of the Council to certain deviations from the plan certified by the District Surveyor, under Section 43 of the Building Act, 1894, so far as relates to the proposed erection of a domestic building on the site of No. 35, 36, 37, Church-lane, and Nos. 6 and 7, Moorset Street, that having regard to the fact that more land is shown upon the deposited plans and to be occupied by the proposed new building than was occupied by the buildings previously on the site, his application is one which in the Council's view it has no power to entertain, and has, accordingly, never considered the application nor given any decision thereon.—Agreed.

Line of Front and Width of Way.

Haggerston.—The erection of Nos. 29, 30, and 31 Reeves-place, Hoxton-street, to abut also upon Nuttall-street (Messrs. Harrington & Lee on behalf of Mr. M. Goldman).—Refused.

Width of Way and Frontage of Building.

Greenwich.—The erection and construction of a temporary wood and iron skittle-alley at the rear of the "Dover Castle" public-house, No. 53, Church-street (Mr. H. J. Miller on behalf of Mr. Farmer).—Refused.

Linthouse.—An open wood and iron shed erected on the south side of St. Paul's-road, near the railway viaduct crossing that road (Mr. A. Heward on behalf of Mr. A. H. Barker).—Consent.

Formation of Streets.

Strand.—That an order be sealed and issued to Messrs. Beadel, Wood & Co., sanctioning the formation or laying out of a new street, for carriage traffic, to lead from Catherine-street to Drury-lane (on behalf of the Trustees of His Grace the Duke of Bedford). That the name, York-street (in continuation), be approved for the new street.—Agreed.

Dulwich.—That an order be sealed and issued to Mr. H. J. Capell, refusing to sanction the formation or laying-out of a new street for carrying traffic, to lead out of Elsie-road and debouch upon the west side of Goose-green, Camberwell, on behalf of Mr. W. H. Thompson.—Agreed.

Lewisham.—That an order be sealed and issued to Mr. W. H. Collier, sanctioning the formation or

ying-out of a new street for carriage traffic, to ad out of Loampit-hill, Hilly Fields-park Estate, hat the name Undercliff-road be approved for the new street.—Agreed.

Wandsworth.—That an order be sealed and issued by Mr. R. C. T. Gordon, sanctioning the formation of a new street for carriage traffic, to ad out of the west side of Garrair-lane, and the widening of that lane and Trevint-street, on the ararat Park Estate, Earlsfield. That the names teoforth-street and Thorndean-street be approved for the new streets.—Agreed.

Paddington, South.—That an order be sealed and issued to Mr. A. M. Ridge, refusing to sanction the formation or laying out for carriage traffic of a new street 40ft. wide to lead out of Moscow-road and arly upon the site of Salem-road.—Agreed.

St. Pancras, North.—That an order be sealed and issued to Messrs. Boehmer and Gibbs, refusing to sanction the formation or laying-out for carriage traffic of a new street to lead out of the west side of figigate-road, and the widening of a portion of a ot-path on the east side of Parliament Hill, on behalf of Mr. A. W. Armstrong.—Agreed.

Woodrich.—That no action be taken with respect to the proposed erection of a pair of semi-detached welling-houses, adjacent to two cottages approached y a way leading out of Mottingham-lane, Eltham; and that Mr. T. Batterbury, District Surveyor, who alled attention to the matter, be informed of this ecision.—Agreed.

Separation of Buildings.

Bermundsey.—The retention of an opening, on the round floor, in the party-wall between Nos. 134 and 136, Old Kent-road (Mr. A. E. Christy on behalf of the executors of the late Mr. J. A. Pash).—Refused.

Height of Building.

City of London.—The erection of a new printing actory and offices on the south side of Tallis-street, Whitelrriers, between John Carpenter-street and Carmelite-street, to exceed in height the distance from the front or external wall on the opposite side of each of the streets upon which the building will but.—Consent.

Hampstead.—The erection of three blocks of residential flats on the north side of West End-lane Messrs. Boehmer & Gibbs, on behalf of Mr. E. J. Cave).—Consent.

Recommendations marked † are contrary to the views of the Local Authorities.

Books.

The Cathedral Church of Exeter. By PERCY ADDLESHAW, B.A. London: George Bell & Sons, 1898.

THE special character of Exeter Cathedral demands unusual attention. The result of Mr. Addleshaw's work, painstaking as it is, is somewhat disappointing. He generalises too much, and though illy remarking the peculiar features of the building, he fails to impress the reader with the exceptional character of the Cathedral, in the massiveness and solidity of the work, so unusual at the period of the transformation initiated by Bishop Bronscombe, and carried on by the master-mind of Bishop Quivil. This spirit permeates the whole, and shows how the Norman work influenced the great prelate, though it is impossible now to determine how much was merely altered or how much was altogether removed and rebuilt. It should have been pointed out how unusually wide and low the proportions are, especially in the features of the building; and though Mr. Addleshaw thinks that near views of the Cathedral are disappointing, his idea will not be shared by those who are struck with its unique breadth and dignity—a consequence of the exceptional proportions.

The author might, with advantage, have been more detailed in places. He seems to stop short of the most interesting points—the Decorated windows of the transepts, for example. The history of the church is concise and interesting, though it might have included an allusion to Bishop Fox's work on the west front; and in quoting Macaulay, some notice should have been taken of his error in the date of the Bishop's Throne.

The description of "The Fabric of the Cathedral" might have been better arranged. Reference is not always easy, and "The Close" and "The Palace" should not have been included under the head of "The Exterior," i.e., of "The Fabric." The accounts of the various monuments would have been better under a separate heading, as are those in the choir and choir aisle, and not jumbled up with the general description of "The Interior." Mr. Addleshaw too, rather overdoes his natural enthusiasm, for it certainly seems absurd to

speak of the "titanic roof"; and in his anxiety to avoid over-technicality he is occasionally misleading. For instance, there are two references to the "cloisters to the north." Would it not have been better to speak of the north walk of the cloisters? The author overlooks the interest attaching to this point; for on this side of the church the buttresses are much deeper, and the cloisters were included within them, forming a number of studies, with a passage against the aisle wall, passing through the buttresses. The traces on the wall are very distinct. A traveller visiting the Cathedral in 1634 speaks of "the brave cloister, all the ceiling above adorned with curious and artificial works, one quarter whereof is converted into a fair library." (Gents. Mag. 58, Part I, 479-487.) Was this the north walk?

Mr. Addleshaw seems also to get confused between the "groining" and "wood roof," and speaks of the "groining" when he means the vaulting. Surely too, his reasons for describing the "Minstrel's Gallery" as such are rather strained. As Mr. St. John Hope has pointed out, this would be more properly described as the organ loft for the services at the nave altars. Then, too, the Chapel of The Holy Ghost can hardly be described as "in the south tower, one of the most ancient portions of the Cathedral"; for it distinctly lies outside the tower, and is Early English in character. St. Gabriel's chapel was probably altered by Bronscombe, but surely Quivil further transformed it. Many people will not see how the west front reminds "one of many French cathedrals," nor will they agree with the author's strictures on the lower part, which he calls the "screen"; nor as to the use of the platform below the west window, for the Chapel of St. Radegunde, included in Grandisson's work, certainly seems to necessitate it. The reader expects some comment on the piercing of the "organ screen," and consequent destruction of the stairs, but neither this nor the position of the nave altars receive notice. Some particulars of the historic organ, built by Loosemore in 1665, would have been welcome, as would also further notes on the stained glass. A list of the Bishops, and a short account of the city close the book.

The photographic views are numerous and excellent, and they are supplemented by plates from Britton's work, and also some old prints and pen drawings by H. P. Clifford. Despite its drawbacks, the work is worthy of the series.

A History of Architecture for the Student, Craftsman, and Amateur, being a Comparative View of the Historical Styles from the Earliest Period. By BANISTER FLETCHER, F.R.I.B.A., and BANISTER F. FLETCHER, A.R.I.B.A. Third Edition. Revised. 8vo. London: B. T. Batsford. 1897.

ABOUT a year and a half ago we noticed the first appearance of this handbook, which has now reached a third edition, at some length. The second edition was a reprint of the first, and, as to the present one, the authors say, in their new preface, that they "have little to add to the expression of this great pleasure that their efforts have met with such wide and general approval. Some slight errors which occurred in the first, and which were kindly pointed out in the Press criticisms, have been carefully removed; some additions to the letter-press have been made, treating more fully certain points which it was thought required emphasising, whilst two plates of Gothic and Classic mouldings have been added." We must confess to some disappointment that the authors, whose industry in compiling the book in the first instance was certainly most meritorious, should display quite so strong a feeling of satisfaction and contentment as breathes throughout their preface. They have certainly corrected or modified some of the more obtrusive of the many "slight errors" which disfigured the first edition, though by no means even all of those which were mentioned in our own notice, and a good deal still remains to be done before the book can be safely recommended for its accuracy in points of fact. Real accuracy, however, of the sort which commands confidence can hardly, perhaps, be expected from authors who have so little sense of the value of references. We commented before upon their neglectfulness in this important particular. The two plates of mouldings added to the present edition illustrate this still further. We hardly suppose—we do not suggest that we are intended to suppose—that Messrs.

Fletcher themselves measured all the examples of Greek, Roman, Norman, and Gothic mouldings here delineated; but if not, it is surely an obligation of ordinary courtesy to the authors whose labours have thus been made use of, as well as a duty owing to every reader of the book, that the sources of these illustrations should be properly described and acknowledged.

There is one statement in the new preface of considerable interest. "In order to treat of the styles which may be termed non-historical, the authors are preparing a second volume." This will doubtless supply some of the omissions which we noticed in discussing the first edition, and as the authors will therein be traversing comparatively unfrequented ground, they will have a better opportunity both of filling up unquestionable gaps in architectural literature and of showing their own skill in original research and generalisation.

Fixtures: Law and Practice. By SIDNEY WRIGHT, BARRISTER. 2nd edition. London: Estates Gazette Office.

It may be noted that the actual date of publication of this book is not stated on the title-page. We call attention to the fact, as the omission of such a date is troublesome to librarians when references have to be made. The book itself is handy, clear, and accurate. It shows, however, that the codification of this branch of the law is greatly needed. It would be a convenience to large numbers of persons if there were a single statute, in the nature of a short code in which the law as to fixtures should be contained. At present the very name is misleading—since, for example, as between landlord and tenant there are fixtures which are removable, whereas the primary idea of the word is that it specifies a chattel or thing which is fixed to the ground, and so becomes the property of the owner of that ground. The subject is one which is of such daily importance to all classes of the community that a book such as that before us is welcome; for often disputes arise as to fixtures simply from an ignorance of legal right, which may be ascertained from this work.

Dilapidations: Law and Practice. By A. T. MACER, Member of the Surveyors' Institution. London: Estates Gazette Office, 2nd edition.

THIS is a useful book, but somewhat wanting in method. The writer does not keep strictly to his subject. For example, on page 31 he says: "A covenant may be dependent on the fulfilment of a condition precedent. Thus, a covenant to keep premises in repair, after the lessor shall have repaired, is conditional; the lessor must repair before it can be attributed to the lessee as a breach of covenant that the premises have been allowed to decay." We do not wish to know this. What is required is a statement as to what are the rights of parties in regard to dilapidations when it is clear that the owner of the property can make the tenant liable for them. Subject to this criticism, useful information may be found in this book, but in a future edition it would be well to be more systematic.

Harbutt's Plastic Method: The Use of Plasticine in the Arts of Drawing and Modelling in Educational Work. By W. HARBUTT. London: Chapman & Hall. 1897.

"PLASTICINE" appears to be a kind of permanent modelling clay which does not get dry and is always ready to model into any shape required, without the dirt and trouble which attend the use of clay. Without seeing and handling the material we cannot of course form any opinion as to its practical merits in this respects, but if it answers to the description given it ought to be a very convenient and useful addition to modern school-room material. It can be used not only for modelling in the round, but for beginners to form simple incised ornament on flat sheets of the material, and even to learn to write on it; the elements of writing, drawing, and modelling being taught with it concurrently. Mr. Harbutt gives various illustrations of the kind of work which can be done in the material. The book is worth the attention of school and home teachers.

BOOKS RECEIVED.

JOURNAL OF THE SANITARY INSTITUTE: Vol. xviii., Part 1. (E. Stanford.)
EVERY MAN HIS OWN LAWYER: Thirty-fifth edition: revised. (Crosby Lockwood & Co.)

EXAMPLES OF GREEK AND POMPEIAN DECORATIVE WORK. By Jas. C. Walt. (B. T. Batsford.)
TABLES OF SQUARE MEASUREMENTS. By F. Trickey. (G. Pulton & Sons.)
THE LAW OF FIXTURES AND REPAIRS. By W. de Bracy Herbert. (Clement Wilson.)

TRADE CATALOGUES.

MESSRS. J. D. F. ANDREWS & CO. send us their catalogue of electric wiring specialties. The concentric system of electric wiring, of which Mr. Andrews was the pioneer, has many points to recommend it, and in private installations it is, perhaps, preferable to any other. It is not suited, however, for installations which are supplied by public supply companies in this country, as it is necessary that the outer conductor be earthed. Useful parallel estimates are given of the cost of concentric wiring and of wood casing double wiring. Various tubes for conduct wiring with all the necessary fittings are also described. A controlling switch-board for use with dynamos and accumulators is worthy of mention, as it has the great merit of simplicity; it is possible to tell at a glance how the apparatus is connected up without having to study a diagram of the board. Andrews' intercommunication telephone system is well-designed, as nearly everything is done automatically, and very little is left to the memory. A cheap "enclosed" arc lamp is also advertised, the carbons of which will burn for 150 or 200 hours. The ventilated resistances described are novel, take up very little space, and prevent undue heating.

—Messrs. J. & W. Guthrie and Andrew Wells send us a book of illustrations of their work in stained glass and furniture, which is of so high a class that it ought hardly to be noticed under the present heading but for the fact that the names of the real artists or designers are not given (except in the case of three windows designed by architects or independent artists—Mr. Whall being one—so that it comes under the category of work put forth by a firm. There is a good deal of originality, as well as good drawing and design, in some of the windows, and the furniture is admirable as a union of good line and solid construction, and moreover has the merit that it does not pretend to revive any special style of a past period. The drawing-room chair on page 37 we do not altogether like—the bulky shape of the legs is commonplace; but the rest of the furniture designs require no criticism.—Messrs. H. Maurer & Son (New York), send us their illustrated catalogue of fire-proof building materials, especially terra-cotta floors and ceilings, in which they appear to be doing admirable work, noteworthy both for its thoroughness and simplicity of construction. We give an illustration, reduced from the catalogue, of their



"Excelsior end-construction flat arch," in which there is a longitudinal terra-cotta course clipping on the iron beam and protecting it, and forming the skewback for the transverse flat arch. The section shows that the construction should be both light and strong. A great many other applications of hollow brick and tile construction are figured in the catalogue, which contains also a good deal of information bearing on the subject.

Correspondence.

To the Editor of THE BUILDER.

THE INTERNATIONAL BUILDING TRADES' EXHIBITION.

Sir,—I am constantly receiving inquiries as to the Building Trades' Exhibition, which your readers, presumably, think is to be held in March of this year.

Will you kindly allow me to state that this exhibition will not be revived until March, 1899.

H. GREVILLE MONTGOMERY.
The International Building Exhibition.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—V.

THE calculation of the strengths of stanchions, columns, and posts is usually carried out by means of formulae, some of which, although easy to use, are not entirely satisfactory as regards accuracy and completeness of the consideration which they ought to give to the various facts which make for strength or weakness of these pieces of construction.

Although in stanchions, columns, and posts, when properly arranged and fixed, the strain is purely one of compression; the manner in which these constructive members fail is seldom due to crushing alone.

In experiments made to determine the crushing strength of various materials, and in the tabulated results of such experiments, as given by various authorities, the specimens on which the experiments have been tried have been comparatively short, and in the form of a cube; that is, they may be described as posts or columns one diameter high. In actual construction it is rarely the case that the height of a stanchion, column, or post is less than ten or twelve diameters in height. That is, these members have a height considerably in excess of their dimensions on plan. When this is the case it usually happens that failure occurs by bending, rather than by crushing of the material. This bending effect becomes more and more pronounced as the relation between the height and the plan dimensions is accentuated; or, in other words, the damage caused by bending is more and more intensified as the height of the column or post in terms of its diameter increases. A thoroughly satisfactory formula, therefore, for the calculation of the strength of stanchions, columns and posts must be one which takes into account this increasing tendency of the constructive member to bend rather than to crush.

A favourable formula for calculating the strength of timber posts is as follows:—

$$S = \frac{a \times d^4}{L^3}$$

where a is $15\frac{1}{2}$ for fir, d the width in inches, L the length in feet, S the safe load in cwt. (d^4 means $d \times d \times d \times d$, and L^3 means $L \times L \times L$). This formula assumes that the strength of a timber post varies inversely as the square of its length, which is not borne out by facts, or experiments demonstrating the facts. The formula, therefore, on this account is unreliable, unless limited in its application. Again, the student will readily perceive that one of the plan dimensions only is taken into account; d representing the least width; so that by this formula a post 9 in. by 3 in. has exactly the same strength as a post 3 in. by 3 in. The formula, therefore, is only approximately true for the square post, and does not contemplate the existence of posts of any other section.

This formula may, however, be used by the student for square timber posts of between 10 and 30 diameters as a rough and ready means of arriving at the approximate value for the safe load.

Several other formulae for timber posts have been proposed by various investigators, but owing to the very considerable difficulty of arriving at a satisfactory formula which will be true for all cases, a comparison of these will show that widely divergent results will be obtained from their use. Perhaps the most generally used formula in this country for all posts and pillars is that known as "Gordon's Formula," which is:—

$$W = \frac{f}{1 + \frac{l^2}{A}}$$

where W is the breaking load in pounds per square inch of area of cross section of pillar, f is a co-efficient depending upon the nature of the material, and, to some extent, upon the shape of cross section of the pillar; it is often taken, approximately enough, as being the ultimate crushing strength of short blocks of the given material. A for wrought iron is usually taken as follows:—

When both ends of the pillar are flat or fixed $A = 35,000$ to 40,000. When both ends of the pillar are hinged $A = 18,000$ to 20,000. When one end is flat or fixed and the other hinged $A = 24,000$ to 30,000. For cast-iron

about one eighth of these figures is generally used, and for fir about one-twelfth. l is the length of the pillar, r is the least radius of gyration of the cross section of the pillar; r and l must be in the same unit, as both in feet or both in inches.

The term radius of gyration, although mentioned in our last chapter, is one with which we may assume that the student has not previously met, and will therefore require some explanation. If we suppose that a body is free to revolve round an axis which passes through it in any direction, or to oscillate like a pendulum hung from a point of suspension, and then suppose further that in either case a certain given amount of force is applied to the body at a given distance from the axis or from the point of suspension, so as to impart to the body an angular velocity, or in other words, cause it to describe a number of degrees per second; then there will be a certain point in the body, such that if the entire weight were there concentrated then the same force as before applied in a similar manner would impart to the body the same angular motion. This point is the centre of gyration, and its distance from the axis or from the point of suspension is the radius of gyration of the body.

The value of the least radius of gyration expressed by the factor r in Gordon's Formula given above, depends upon the form of the cross section of the pillar, and we give below a series of values for r , with different shapes of cross section.

$$\text{Solid square } r = \frac{\text{side}}{\sqrt{12}}$$

$$\text{Hollow square } r = \sqrt{\frac{D^4 + d^4}{12}}, \text{ } d \text{ being the internal and } D \text{ the external length of side.}$$

$$\text{Solid rectangle } r = \frac{\text{least side}}{\sqrt{12}}$$

$$\text{Hollow rectangle of uniform thickness } r = \sqrt{\frac{B^4 A - b^4 a}{12(BA - ba)}}$$

B being the external and b the internal length of short side; A the external and a the internal length of long side.

$$\text{Solid circle } r = \frac{\text{diameter}}{4}$$

$$\text{Hollow circle of uniform thickness } r = \sqrt{\frac{D^4 + d^4}{10}}$$

D being the external and d the internal diameters.

$$\text{I beam } r = \frac{F}{4 \cdot 58}, \text{ } F \text{ being width of flange.}$$

$$\text{Channel iron } r = \frac{F}{3 \cdot 54}, \text{ } F \text{ being width of flange.}$$

$$\text{Angle iron with equal sides } r = \frac{F}{3}, \text{ } F \text{ being width of side.}$$

$$\text{Angle iron with unequal sides } r = \frac{Ff}{2 \cdot 6(F+f)}, \text{ } F \text{ being greater side, and } f, \text{ lesser side.}$$

$$\text{Tee iron with equal dimensions } r = \frac{F}{4 \cdot 74}, \text{ } F \text{ being width.}$$

$$\text{Cross with equal dimensions } r = \frac{F}{4 \cdot 74}, \text{ } F \text{ being width.}$$

These data will enable the student, with a little more advance in his practice, to find the strength of pillars or posts of various forms and various materials; but as at present we are directing our attention mainly to timber posts, we may give a modification of Gordon's formula adapted for rectangular timber posts, whether square or of other rectangular forms, thus:—

$$W = \frac{5,000}{1 + \left(\frac{l^2}{B^2 \times .004}\right)}$$

Where W is the breaking load in pounds per square inch of area of a fir post, l the length in inches B the breadth in inches. The results obtained from this modified formula for timber posts have been found to approximate with a fair degree of accuracy to experiments made by Kirkaldy.

It should be observed that Gordon's formula is intended to hold good for posts or pillars of more than ten diameters in height. For timber posts of a less number of diameters in height, the strength of the post may be fairly taken as equivalent to the crushing strength of the material.

The student will notice that the results with Gordon's formula, and the modified form of it, which we have given for timber posts, give breaking load; and the factor of safety must therefore be selected. In important buildings and pieces of construction, timber should not be tried with more than one-eighth to one-sixth of its crushing load, and for temporary purposes not more than one-sixth to one quarter. In both cases these figures apply for stationary loads; with live loads or shock, the load should not be more than one-twelfth to one-tenth of the crushing load. It should also be borne in mind that there is a very considerable difference between the strength of well-seasoned and green timber. Hodgkinson, in his experiments, found that perfectly seasoned blocks, two diameters long, required in many cases twice as great a load to crush them as when only half seasoned.

GENERAL BUILDING NEWS.

CHURCH, LEEDS.—The temporary Church of St. Margaret is now in course of erection on a site adjoining Carigan Villas, on the east side of Cardigan-road, Leeds. The building is 70 ft. long by 32 ft., and will accommodate about 300 people. Clergy and choir vestries are provided. Messrs. Smith & Tweedale are the architects.

CHURCH, MAESTEG, GLAMORGANSHIRE.—A new church has just been erected at Maesteg. The building will accommodate nearly 600 worshippers. The nave is 37 ft. wide, and is designed so that practically every member of the congregation may see the communion table. On either side of the nave is an arcade, with clearstory over. The choir is raised above the body of the church, and will seat about 100 persons. The ground floor of the tower provides organ space, with choir vestry, and there is a clergy vestry in the tower basement, with separate entrance communication, by means of a staircase, with the choir vestry above. The font is placed at the west end of the church, where a baptistry is also provided. The pulpit is composed of green Bridgend stone, carved, with red iris marble shafts and bands of polished pink alabaster. The tower is not completed, but is designed to attain a height of over 100 ft. The open timber roof is of pitch pine, left plain, and is covered with green slates. The contractor was Mr. McGail, of Bridgend, and the design has been carried out under the direction of the architect, Mr. G. E. Halliday, the Diocesan Surveyor for Llandaff.

RESTORATION OF HONINGHAM CHURCH, NORFOLK.—The Church of Honingham was reopened on the 23rd inst. after restoration. In the chancel a new oak roof has been placed, the reredos has been heightened, and a new dais has been erected, while the walls have been coloured. In the nave the roof and walls have been coloured, and round the latter a dark dado has been painted. The whole church has been refloored, tiles being placed in the passages and wood blocks elsewhere. The old-fashioned deal seats have been replaced by open oak benches, but a few of the old bench-ends have been retained. The steps of the pulpit have been remodelled, and a new heating apparatus has been supplied. The walls of the tower have been repaired, and the structure of the structure has been converted into a choir vestry, while above an oak floor has been placed for the ringers. The porch has been repaired, and the stone work and roof of the vestry have received attention. The old organ, which was at the west end of the church, has been removed, and a new organ has been erected in the chancel by Messrs. Norman and Beard of Norwich. The work has been carried out by Mr. Chapman of Hanworth, under the direction of Mr. Herbert J. Green, architect, of Norwich.

WESLEYAN METHODIST CHAPEL FOR ATHONTON, LANCASHIRE.—It is proposed to erect a new Wesleyan Chapel in Bolton-road, Atherton, from plans prepared by Messrs. Bradshaw & Gass, architects, Bolton. The contract has been let to Messrs. George Wood & Son.

OXFORD-PLACE WESLEYAN CHAPEL, LEEDS.—About 14,000l. is being spent on the rebuilding of Oxford-place Wesleyan Chapel and Sunday School, Leeds. The front and one side of the old chapel have been taken down and replaced by more attractive elevations. This work has been carried out without closing the chapel, which is being used as usual for services. The old Sunday school has been demolished, and a new school is nearing completion, and will be ready for occupation about May. After the opening of the school, the chapel will be closed for interior alterations. Mr. G. F. Danby and Mr. W. H. Thorpe, of Leeds, are the joint architects.

NEW U.P. CHURCH FOR AYR.—A new U.P. church is to be erected in Ayr on a site which has been secured at the angle of Midton and Carrick Park-roads. The church has been designed by Mr. John B. Wilson, Glasgow. The church is to be seated, in the first instance, to accommodate 550 persons. The accessory rooms include vestry, session-house, ladies' room, kitchen, &c. Balloch-

myle red stone will be used. The estimated cost, including organ, is 6,000l. The church is to be known as Trinity U.P. Church.

WESLEYAN CHAPELS, LEEDS.—A new chapel connected with the Woodhouse Moor Circuit is being built in Cardigan-lane, Burley. The new building is expected to be ready by June. The estimated cost is 5,500l. The architect is Mr. G. F. Danby. From designs by the same architect, another chapel is being erected in Ladypit-lane, Holbeck, to take the place of a small mission room. The cost will be about 1,100l.

WESLEYAN CHURCH, KING'S HEATH.—The new Wesleyan Church in Cambridge and School roads, King's Heath, was dedicated on the 21st inst. The building, which is 80 ft. long, by 49 ft. wide, and 12 ft. high, is divided into nave and aisles by three arches on each side, supported by polished red iron cast-iron piers, with a twelve-light wheel in the upper part. This window has, at the cost of Alderman Bowen, who has carried out the building of the structure, been filled with stained glass from the studio of Messrs. Camm & Co., Smethwick. The subjects are "The Last Supper," "The Nativity," and "The Ascension." The twelve lights of the "wheel" surmounting the three windows contain emblems of the twelve tribes of Israel, with a representation of angels attending the Saviour forming the centre. Below the window is an arched "erodo," containing the Lord's Prayer, the Ten Commandments, and the Creed in letters of gold. The main aisle, are the gift of Alderman Bowen. The main entrance is from Cambridge-road. At the west end of the church is a gallery, backed by a window of tinted glass. The exterior is of red terra-cotta and brick. The style adopted by Mr. William Hale, the architect, is based on the Early English period. The woodwork generally is of pitch-pine. The roof of the nave and corbels are the work of Mr. Martyn, of Helttenham. The gas-fittings and gasaliers have been supplied by Messrs. Hart, Son, Peard, & Co.; he glazing has been carried out by Messrs. Pearce, Limited; and the heating arrangements by Messrs. Renton, Gibbs, & Co. The cost of altering the existing building and erecting the new structure will be somewhat under 6,000l.

PRESBYTERIAN HALL, NEW BENWELL.—On the 10th ult. the new hall in connexion with the Presbyterian Church of England, Armstrong-road, New Benwell, was opened. The new hall has seating accommodation for 450 people, and it is part of a scheme to erect a new church and hall. Messrs. Jadenoch & Bruce were the architects.

CHRISTIAN UNION CHURCH, SMALL HEATH, NEAR BIRMINGHAM.—The foundation-stone of the Midland Christian Union's new church in the Waverley-road, Small Heath, was laid on the 20th inst. The buildings comprised in the present contract consist of the church only; school-buildings and a tower and spire to the church, all of which have been designed for the complete scheme, have for the present been omitted. The church is planned with nave, aisles, chancel, organ chamber, vestries, and porches on right and left of the nave at the front. One of the porches will form the base of the tower to be ultimately erected. The nave will be 58 ft. long and 28 ft. wide. The aisles will extend the full length of the nave, and will be lit by lancet-shaped windows. The chancel will be 24 ft. wide and 16 ft. 6 in. in depth. The choir-stalls will be on either side of the chancel. Externally, the building will be of red brick and dressings of stone. The interior will seat about 500 worshippers, and will be heated by a low-pressure system of hot-water pipes and radiators. Messrs. J. A. Grew and S. H. Enchus, of Birmingham, are the architects; and Messrs. Whitehouse & Son are the builders.

PROPOSED WESLEYAN CHAPEL, BRINSFALL, LANCASHIRE.—Plans for this building have been prepared by Mr. W. H. Dinsley, architect, of Chorley. The building is to be of white Yorkshire stone, at an estimated cost of 2,200l.

SUNDAY SCHOOL, QUORN, LEICESTERSHIRE.—A Sunday school was opened at Quorn on the 10th inst. The building, which adjoins the old Baptist Chapel in Woodhouse-road, is of red brick with a granite base. The schoolroom is 31 ft. long, 20 ft. wide, and 12 ft. high. Seating accommodation is afforded for 110 children. At the far end of the room there is a platform, and to the left is a doorway leading to the lobby, which opens into the old school. The work has been carried out from plans prepared by Mr. G. T. North, architect, of Quorn. Mr. J. Horspool was the builder, Mr. Ernest Fewkes did the woodwork, Mr. W. H. Backhouse the plumbing and heating, and Mr. W. Y. Swain the painting.

NEW BOARD SCHOOL, COLCHESTER.—The new St. Martin's Infant Schools in Stockwell-street, Col-

chester, which have been built by the School Board to accommodate 241 infants and first standard children, were opened recently. Mr. Charles E. Bulcher, of Colchester, was the architect. The building is of red brick. There is a school-room, 43 ft. 6 in. by 21 ft. 6 in.; and a couple of classrooms at the west side are 21 ft. 6 in. by 18 ft. and 20 ft. 6 in. respectively. Then there is a babies' room, and near by the teachers' room. All the rooms contain fireplaces, and the floors are of pitch pine, the dado of the coloured walls being also of pitch pine. The builder was Mr. Dupont.

SCHOOL, ABERTILLERY.—A new school for the Abertillery Intermediate School district has just been opened. Messrs. Swash & Bain, of Newport, were the architects, and Mr. David Lewis, of Llan-hilleth, was entrusted with the contract. The school, which is of two stories, provides class-room accommodation on the first floor for 40 girls. There are also a class-room for cookery, and an assembly hall, centrally placed, in conjunction with which, by an arrangement of revolving shutters, an adjoining class-room can be used. The boys' department occupies the ground floor, provision being made in the respective class-rooms to accommodate 60 boys. There is a chemical laboratory. Private rooms are provided for the master and mistress on the first and second floors respectively, as well as store-rooms and cloak-room accommodation. The external walls are sound-proof and fire-proof. The external walls are built with local stone, the dressings being of Bath stone and Ebbw Vale buff brick. The contract amounts, together with the cost of retaining walls, to 2,430l.

SCHOOLS, GLASS Houghton, YORKSHIRE.—The new building at Cutsyke, erected by the Glass Houghton School Board, was opened recently. Mr. George F. Pennington, of Castleford, was the architect. The mixed school occupies the main elevation. By a system of folding partitions, the mixed school may be converted into three class-rooms, and in addition to these there is a permanent class-room adjoining. At right angles to the main block, there is an infant school, while approached by a flight of stairs, is a room for the teachers. The contract has been carried out by Messrs. Jackson Bros., of Goult, who sub-let a part of the work as follows:—Plumbers, Messrs. W. Wilson & Son; plasterers, Mr. Smithies; slaters, Mr. Allison, all of Castleford. The heating is by low-pressure hot water. The total cost has been about 2,400l.

HIGH SCHOOL FOR GIRLS, SHREWSBURY.—Her Royal Highness the Princess Louise, Marchioness of Lorne, opened on the 10th inst. the new high school for girls which has just been completed by the Girls' Public Day School Company at Shrewsbury. The building is situated at the corner of Murivance and Kingsland Bridge-road. The work has cost about 9,000l. On the lower ground floor is a cloak-room (51 ft. by 25 ft.), offices, and special accommodation for cycles, kindergarten, dining-rooms, kitchen and domestic accommodation. The pupils' entrance to this floor is by means of an inclined way from the street. The upper ground floor is raised a few feet above the street level, and contains the main entrance, office and waiting-room, an assembly hall (51 ft. by 32 ft.), class-rooms, and staff accommodation. The class-rooms are entered from the hall corridor. On the floor above are more class-rooms, studio, laboratory, music-rooms, and caretaker's accommodation. The class-rooms on this floor are entered from galleries on three sides of the assembly hall. The assembly hall, about 45 ft. high, and it is fitted up as a gymnasium. The elevations are of red bricks relieved with stone-work, and some oak timber framing and some plaster work in the upper story and gables. The main entrance from the street is through a porch. The architect was Mr. A. C. Lloyd Oswell, of Shrewsbury. The work has been carried out by local tradesmen. Mr. William Bowdler was the builder. The plumbing work has been done by Messrs. Scull Bros. The asphalted roofs and floors were executed by Melsom's, of Birmingham; and the hot-water piping by Stainton, of London. Mr. H. L. Whit-fingham has acted as clerk of works.

BRITISH SCHOOLS, TRURO.—New British Schools have been erected at Truro by Messrs. Clemens & Battershill, from the designs of Mr. S. Trevali, the contract price being 1,082l. Accommodation is afforded for 450 children.

HOSPITAL EXTENSION, SHIELDHALL, GOVAN, GLASGOW.—The additions which have lately been made to the Govan Combination Hospital at Shieldhall were opened on the 20th inst. The extensions consist of two new pavilions, a separate bath-house for the use of patients on their discharge, a small independent steam washing-house and laundry for clothes infected with smallpox, and a further addition to the administrative block. The western pavilion, which is intended for the treatment of scarlet fever, is divided into two wards, each measuring 60 ft. by 28 ft., and capable of accommodating twenty adults. The eastern pavilion is almost similar, except that it is divided into four wards, two for acute and two for convalescent cases. The former measured 48 ft. by 28 ft. each, and the latter 24 ft. by 28 ft. Each acute ward will accommodate eight, and each convalescent ward four adults. The administrative block, as now extended, contains apartments for doctor and

matron, nurses and servants, and twenty-eight bedrooms; also a dispensary, general kitchen, and other accommodation. All the buildings are heated by steam. The cost of the extensions is estimated at £2,350. The plans for the new buildings were prepared by Mr. Allan, Burgh Surveyor, Govan.

EXTENSION OF THE KEIGHLEY HOSPITAL.—A start is shortly to be made towards enlarging and adding to the premises of the Keighley and District Hospital. Plans have been prepared for new buildings, which will cost not far short of 16,000. The architects are Messrs. W. & J. B. Bailey, of Keighley and Bradford.

JUBILEE WING, PETERBOROUGH INFIRMARY.—The extension of the Peterborough Infirmary, which forms the permanent memorial of the Queen's Diamond Jubilee, and has been carried out at a cost of over 2,000, has now been completed. The work has been carried out by Mr. John Thompson, from plans prepared by Mr. H. M. Townsend, a great deal of the original stone being used.

SALISBURY TOWER AND SPIRE.—During the past year the turret staircases at the four angles of Salisbury tower have been all repaired and strengthened. The pinnacles also between these at the base of the spire have been repaired. On all four sides of the tower defective masonry has been taken out and replaced by new stones. Very little remains to be done beyond repair of ornamentation. The foundations of the south aisle and of the west side of the south transept have yet to be treated as those on the opposite side. It is expected that everything will be finished and the scaffolding removed by the middle of May. The work in connexion with the foundations has proved less costly than was anticipated. About 2,500, is now required to complete the entire work. The architect is Sir A. Blomfield, and the contractor is Mr. Thompson.

PROPOSED NEW MUSIC HALL FOR SWANSEA.—At the Works and Sanitary Committee of the Swansea Corporation recently, plans prepared by Mr. Walter Embley, of London, and Mr. W. L. Griffiths, of Newport, for a new music hall for Swansea, were submitted. The site is in Oxford-street. The re-building of the Oxford Hotel is included in the plans. The total cost will be about 10,000. Consideration of the plans was deferred till the Surveyor had reported.

ASYLUM, DUNDEE.—An asylum is to be erected by the Directors of the Dundee Royal Lunatic Asylum for accommodation of private patients. The building is to be erected on the ground belonging to the Asylum at West-green, and will be separated from the present structures. It will be in two blocks, partly of three and partly four stories, and will contain public rooms, dormitories, and day rooms, the additional accommodation provided being for seventy patients—thirty-five men and thirty-five women. In the central space between the two blocks, and connecting them with what are known as the day dormitories, will be the administrative department of the structure, consisting of a kitchen with its necessary adjuncts, matron's and servants' room, common dining-room and entrance hall. The last-mentioned will be used at times as a recreation room. Open fires will be placed in the apartments, and there will also be pipes fitted throughout the buildings for heating with steam. The architect is Mr. T. S. Robertson.

PROPOSED NEW PUBLIC HALL, HALIFAX.—The directors of the company which was recently formed at Halifax to promote the erection of a public hall have adopted plans of the building—which it is proposed to erect at the junction of Fountain-street and Commercial-street—prepared by Mr. W. C. Williams, architect, Halifax. The seating accommodation in the large hall will be as follows:—Auditorium 870, grand circle 500, orchestra 350, balcony 754—total, 2,474. In addition, provision has been made for a lecture theatre, with accommodation for 301. The total accommodation will be for 2,850. It is proposed to erect six large shops, with a frontage to Commercial-street, and one on each side of the main entrance at the corner of Fountain-street. The scheme also provides for a restaurant and a reading-room.

ENLARGEMENT OF CARDIFF CASTLE.—It is stated that plans have been prepared by Mr. Francis architect to the Marquess of Bute, for the addition of a suite of state apartments at Cardiff Castle. The contract has been let to Messrs. W. Thomas & Co., contractors, Cardiff, by whom the foundations are now being put in. The addition will be inside and parallel with the southern wall of the castle, commencing near the clock tower.

ADDITIONS, ROYAL SAILORS' HOME, PORTSEA.—In commemoration of her Majesty's Diamond Jubilee it was resolved to build a wing in connexion with this building, and this is now approaching completion. In the basement of the new wing is being constructed a bowling alley, 80 ft. by 26 ft., and there is also a large store-room, 40 ft. by 26 ft. A portion of the cellarage will be set apart as a bicycle store. On the ground floor is a reading room, 36 ft. by 26 ft., and a kitchen, 34 ft. by 25 ft., besides larders, and a store and scullery, and an open yard with an entrance into Hanover-street. The main staircase has been improved, and the alterations and additions on the ground floor include

a larger bar, and sitting-room, bedroom, and lavatory accommodation, fifteen chairs for the servants, and a servants' hall, 21 ft. by 16 ft. On the second, first, second, and third floors are fifty-three cabins, about 6 ft. 6 in. by 5 ft. 10 in., and a separate staircase. The whole of the wing is lighted with electric light and gas. Mr. Vernon-Inkpen is the architect, and Mr. Croad the contractor.

LIFE ASSURANCE BUILDINGS, LEEDS.—Buildings are about to be erected for the Standard Life Assurance Company on the site of the Old Post-office in Leeds. The preparation of the plans of the new buildings has been entrusted to Mr. Archibald Neill, Leeds, and the work will be carried out under his supervision. The facade will be of stone, Bolton Wood in the basement, and the remainder Portland. Internally, the accommodation will comprise between forty and fifty suites of offices. The main entrance to the building will be from City-square; the offices facing Park-row will have separate entrances. The basement will have an entrance at the lower side of the site. The various stories will be reached by an elevator as well as by staircases. Mr. Isaac Gould is executing the contract for the digging of the foundations. The estimated cost of the structure is about 30,000.

MUNICIPAL WORKSHOPS, BATTERSEA.—On the 22nd inst. municipal workshops were opened for the Vestry of the parish of St. Mary, Battersea. The premises are the outcome of an experiment started by that body some years ago, with the idea of becoming independent of the contractor with regard to parochial public works, by carrying out the work themselves. The experiment answered so well that out of twenty-six new works accomplished since October, 1895 (when the Vestry definitely resolved on doing all their own work), the estimated cost has been exceeded in only three instances, representing a total of 204, while, on an actual expenditure of 21,818, the savings on the carrying out of the work, 2,000. Experience showed, however, that the aspiration for complete parochial independence of the middleman could not be obtained until the Vestry had a set of workshops where it could make all, or nearly all, its own apparatus and appliances, and hence the present provision of workshops. The principal block covers a space of 280 ft. by 25 ft. and is built in two stories. On the ground floor there is a joiners' machinery department, an engine-room, a wheelwrights' shop, a forge for smiths and farriers, a harness makers' room, and a painters' room. On the upper floor there is a joiners' shop, which has twelve benches, and lantern lights in the roof as well as side windows; a vanbody makers' shop, and also departments for plumbers and smiths and fitters. Connected with the vanbody makers' shop there is a lift which raises 30 cwt. from the ground floor. The "forge" is a shop 50 ft. long by 22 ft. wide. The total cost of workshops and machinery is 8,000, but it is estimated that henceforward a saving of 10 per cent. will be effected by the Vestry on all the work it does. The workshops were designed by the Vestry's Surveyor, Mr. J. T. Pilditch, and they are now in charge of the superintendent of works, Mr. Thomas Sheppard.—Times.

CLUB, HARTLEPOOL.—The foundation-stone of the new club which is being erected by the Hartlepool Recreation Committee at the corner of the new road, was laid on the 20th inst. The building is being erected by Mr. W. Pearson. The architect is Councillor W. Young, and the plumbing and gasfitting work is being done by Mr. R. Henderson. On the ground floor of the building is a billiard-room, 42 ft. by 24 ft.; a games-room, 18 ft. by 17 ft.; and a committee retiring room, 18 ft. by 18 ft. On the first floor there will be an assembly or ball room, 53 ft. by 42 ft., and two ante-rooms, 18 ft. by 10 ft. In the basement there is a room for storing bicycles, &c., 42 ft. by 22 ft. It will be a brick building with stone dressings.

POLICE STATION, REDDITCH.—A new police station is being erected at Redditch, under the direction of Mr. H. Rowe, County Surveyor, by whom plans were prepared. The contractors are Messrs. C. G. Huins & Sons, and the clerk of works is Mr. E. T. Fletcher.

NURSES' HOME, LEEDS.—The new Nurses' Home which is being erected behind the Leeds Infirmary will provide accommodation for fifty-two nurses. In addition to bedrooms, there will be a recreation room, a sisters' room, a visitors' room, and a study. Mr. W. H. Thorp, of Leeds, is the architect.

PEOPLE'S PALACE, GLASGOW.—On Saturday last a People's Palace was opened at Glasgow by the Earl of Rosebery. The building, which was designed by Mr. A. B. McDonald, the City Engineer, occupies a site not far from Nelson's Monument. It has a northward frontage towards Montlieh-row. The front part, constructed of Danby red stone, is utilised as museum and picture-gallery, and has direct communication with the winter garden in the rear, which is constructed of iron and glass. The frontage is about 100 ft., and the width of the building is 40 ft. The facade has been broken up by the projection of the centre and the wings, and the sky-line is emphasised by an octagonal dome. The building is entered from the centre and access is gained through three arches leading to three corresponding doors, which open into the entrance hall, which is oblong. To right and left are two rooms intended for reading and recreation purposes, while

directly in front a staircase leads to the upper floors. On either side of the stair a short passage communicates with the winter garden. The first floor extends the whole length of the building as one room, the floor space being interrupted only by the bases of the supporting columns, and it has been intended for museum purposes. At either end of this room are staircases leading to the second floor, which consists of three apartments, to the centre of which—that is to the winter garden. The stairs lead to this room, which is 35 ft. across, is lit from the dome as well as from the front, and has a large available wall space of about 25 ft. in height for pictures. It communicates through an arched opening with the end galleries, which are partly top, and side lighted, and which, along with the large room, are to be used for the exhibition of pictures.

THEATRE, HANLEY, STAFFORDSHIRE.—Trinity-street, Hanley, is being transformed, and one of the most important buildings being erected is the Grand Theatre and Opera House for Messrs. C. and G. Elphinstone. The architect is Mr. Frank Matcham, of London, and the contract has been let to Mr. T. Godwin, of Hanley. The exterior of the theatre—which will be 180 ft. long and 130 ft. deep—will be built of red bricks with stone dressings, surmounted at the corner with a dome and a 40 ft. flagstaff. The entrance to the better parts of the house will be at the angle of the streets, whilst admission to the pit and upper circle will be from Trinity-street, and to the gallery from Foundry-street. Separate doors for the entrances will be also provided. The house is to be 32 ft. wide, with a length of 80 ft., from back of the pit to stage wall, the stage having a depth of 46 ft. The accommodation will provide for 4,000 persons.

BUILDING IN ABERDEEN.—There has been rather a lull in the building boom lately, so far as mason work is concerned, most of the big contracts recently reported being finished; but there were submitted this week, for approval by the Town Council, plans of one block of twenty-two tenement dwelling-houses at Great Northern-road, and of another of seven similar houses at Torry, south side of the River Dee, Mr. W. Ruxton, Aberdeen, being architect, and the total estimated cost, 25,500.

SANITARY AND ENGINEERING NEWS.

WITNEY URBAN DISTRICT SANITATION.—In reference to our Note (page 34 *ante*) on Dr. Fletcher's report on the sanitary condition of Witney, the solicitor to the Witney Urban District Council writes:—"Referring to a paragraph which recently appeared in your paper on the report of the Local Government Board Inspector, in reference to this district, I am instructed by my Council to forward you the enclosed extract from the report of their Works Committee thereon." The following is the extract referred to:—"It is presumed that the Inspector arrived, to some extent, at the conclusion he did from the case referred to at Buckle's Yard, where, it is stated, there were four closets intended for use as pail closets, but unprovided with pails. This is an unfortunate error on the part either of the Inspector or his informant, as this case appears to have unnecessarily prejudiced him against the pail-closet system in vogue generally in the town. The closets in question were simply old privy vaults, never intended to be used as pail-closets at all, and were at the time of the Inspector's visit under notice. Since then they have been filled in, and pail-closets substituted, the result being highly satisfactory. The Committee are so well satisfied with the pail-closet system that they recommend the Council to substitute it for the cess-pit system wherever practicable."

SEWERAGE, LANISHEN, NEAR CARDIFF.—The sewerage of Llanishen is now complete, and consists of about six miles of stoneware pipe sewers, varying in size from 9 in. to 18 in. internal diameter, having an outfall into the Ystradgwydr and Pontypridd main sewer at a point near Fairbrook Farm. The sewers are constructed on the duplicate or separate system—the sub-soil and surface water is excluded from the sewers. Messrs. Batchelor & Snowden, Cardiff, were the contractors, and Mr. Wm. Fraser, the Surveyor to the Llandaf and Dinas Powis District Council, was the engineer.

SEWERAGE, ILKLEY.—The Ilkley Urban District Council are occupied in dealing with their Ben Rhysdyd sewerage, which at present, in its crude state, runs into the River Wharfe. Sewerage and sewage disposal works are in progress, the works having been started in November last. The sewerage work, Contract No. 1, is being executed by Messrs. A. Braithwaite & Co., of Leeds. Contract No. 2, which includes the outfall and sewage disposal works, is entrusted to Mr. Walter Binns, contractor, Bradford; while the extension of the existing works at Ilkley has just been let to Mr. W. Briggs, contractor. The engineer for the entire sewerage works is Mr. Jno. Waugh, C.E., of Bradford; and the clerk of works, Mr. Geo. Paterson, of Patricroft.

ABERDEEN CITY WATERWORKS.—In consequence of complaints as to the quality of the city water supply, Mr. W. Dyack, C.E., Borough Surveyor, has been instructed to report as to the substitution, from Aberdeen to Culter, and in the borough of

anchory, a total distance of about eight miles, of iron pipes for the present brick aqueduct.

ABERDEEN HARBOUR.—The plan prepared by Mr. R. K. Nicol, resident Harbour Engineer, for a new steel cantilever swing bridge (with double line of rails), from Regent Quay to Jamieson's Quay, has been approved of by the Consulting Engineer, Mr. J. Wake, Sunderland. In order to accommodate the large passenger traffic from one side of the locks to the other at the spot, a temporary bridge will be provided during the construction of the swing bridge, which will forthwith be contracted for. The widening of Regent Quay in connexion with the improvement is being carried out by the Harbour Board's own workmen, and will, by itself, cost about 40,000*l*.

IMPROVEMENT SCHEME, WITHINGTON, LANCA-SHIRE.—Mr. Robert H. Bicknell, Local Government Board Inspector, held an inquiry at the Withington Town Hall on the 21st inst. respecting the application of the Withington District Council for sanction to borrow 12,100*l*. for works of sewerage and private street improvement, 371*l*. for works of public street improvement, 2,200*l*. for the erection of a building and the purchase of machinery for the manufacture of concrete slabs, 435*l*. for the provision of stables, and 120*l*. for the purchase of a stone-breaker; total, 15,281*l*. Mr. Mountain, Surveyor to the District Council, gave evidence.

SEWERAGE DISPOSAL, KIRWORTH.—The Market Harborough District Council having applied to the Local Government Board for sanction to borrow 3,550*l*. for the construction of sewerage and sewage disposal for the parishes of Kibworth Beauchamp and Kibworth Harcourt, Colonel Marsh, R.E., attended at the Kibworth Village Hall recently to receive evidence. There were also present, Mr. Everard, C.E., Mr. Burgoin (clerk to the Harborough District Council), Mr. Blount (District Sanitary Inspector and Surveyor), and others.

FOREIGN.

FRANCE.—The Orleans Railway Company has decided to present to the State the frescos by Chassériau on the walls of the Cour des Comptes, if it is found possible to preserve and detach them. M. Benjamin-Constant is at present engaged in completing the ceiling painting of the new Opéra Comique, which consists of a collection of great personages in drama—Romeo and Juliet, Sappho, Mignon, Mireille, &c. M. Grémiot has just sent to the Sévres manufactory the figure of "Perseus" which is to form the principal motif in the table centre-piece which is being made for the President, and which will figure in the 1900 Exhibition.—M. Mercie has finished the model for the monument to Alfred de Musset, offered to Paris by M. Osiris, and which will be erected either on the Place St. Augustin or (which will be preferable) on the Place du Théâtre Français.—The Paris Council have commissioned M. Deblois to produce an etching of the large picture painted by M. Tattet representing the entry of Louis XI. into Paris; and M. Greux has been commissioned to make an etching of the ceiling design, "La Terre," by M. Georges Bertrand. The two pictures, it may be remembered, are among the decorations of the Paris Hôtel de Ville.—M. Emile Bertone, the architect, has presented to the Académie des Beaux-Arts six-seventeen Greek, Latin, and other inscriptions which he collected during his stay at Palmyra, in 1895.—MM. Roux and Moreau have been appointed members of the "Conseil-General des Bâtiments Civils" in place of MM. Dutert and Formigé.—Eighty French architects have taken part in a competition opened by the New York Assurance Company for two houses at Paris, Rue de Pelletier and Boulevard des Italiens, the latter on the site of the old Café Riche. Among the best and most important designs are those by MM. Goustreau, Emile Bertone, Francastel, Maistrasse, Lafille, Esquié, and Depertthes. We shall probably be able to give the result in our next issue.—The death is announced, at the age of seventy-one, of M. Jules Leonard, painter, a native of Belgium. He died at Valenciennes. He devoted himself specially to lithography, and produced in this process a number of portraits, as well as reproductions of the works of old masters. He was latterly manager of the Museum and Academy of Valenciennes.

GERMANY.—We hear from Aschaffenburg, near Frankfurt, that one of the station buildings has been moved a distance of 120 metres on the American system of rollers and winches. The building, which has two floors, was well strutted, placed on rollers and then moved to its new foundation, the time required being a fortnight, and the cost being near 750*l*.—The historical artillery barracks at Berlin are being pulled down in order to make room for some street improvements near the Kupfergraben, opposite the so-called Museum Island. The old block was certainly an eyesore in this district.—Some interesting statistics regarding the Berlin theatres have lately been published, and we find that the German capital has twelve *bond-fide* playhouses, including two Court Theatres, with seating accommodation, altogether, for 17,500. With the various secondary theatres, audiences to the number of 40,000 can be accommodated. This is a curiously small

total in comparison to London.—The large frescoes in the Salle des Pas Perdus of the Houses of Parliament have now been completed by Herr Koberstein.—We hear that building operations have been in no wise impeded at Berlin this winter by frost, with the exception of a few days; whilst, as a rule, there are very considerable stoppages, sometimes to the extent of two or three months.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. A. H. Heron, architect, of 27, Fitzroy-street, Fitzroy-square, has taken into partnership Mr. Clifford Bellairs, and the style of the firm will be "Heron & Bellairs."

FONT, PARISH CHURCH, KIRRIEMUR.—A baptismal font has been placed in the parish church, Kirriemur. It has been erected in Caen stone from a design by Mr. Alexander Johnston, architect, Dundee. The design is in the Early English style, and shows a deeply-moulded octagonal base with centre column and four smaller shafts of Victoria red marble grouped at right angles and supporting a foliated carved capital, on which rests the bowl. The font has been erected by Mr. Alexander Neilson, Dundee.

CITY-SQUARE, LEEDS.—The hoarding which now hides City-square from public view is expected to be removed in about six weeks. The granite balustrade, which forms a circle about 100 ft. in diameter around the space where the equestrian statue of Edward the Black Prince is to stand, is almost completed. The concreting of the circle is finished, but the flagging outside the balustrade remains to be done. Around the balustrade eight small figures, representing alternately night and morning, are to be placed. Each figure will hold a 500-candle-power electric lamp. These figures are expected to be ready before the close of the present year, but 1899 will be well advanced before the central statue is ready for unveiling. The plans for laying out the square were prepared by Mr. Bakewell, architect.—*Leeds Mercury.*

MASTER BUILDERS' ASSOCIATION FOR MORE-CAMBE.—A meeting of employers connected with the building trade was held recently for the purpose of considering the advisability of forming a Masters' Association with a view to protecting their interests in the town. Addresses on the advantages of federation were given by Mr. Tomlinson (Preston), secretary of the Lancashire Federation; Mr. Gartside (Chorley), and Messrs. Parker, Kidd, and Sharples (Longridge). After some discussion, it was decided that an Association be formed, and that a committee, consisting of Councillors J. Scott, J. H. Brear, J. Gardner, and Messrs. J. Ecolme, and A. Woodhouse, be appointed to draw up the necessary rules.

BUILDING TRADES FEDERATION, PAISLEY.—A meeting of those connected with the various branches of the building trades in Paisley and district was held on the 17th inst in the Terrace God Templars' Hall, Paisley, Mr. John Bryce, builder, in the chair. A deputation from the Scottish Building Trades Federation—consisting of Mr. R. A. McGillivray, plasterer; Mr. John Adam, builder, members of Executive; and Mr. James L. Selkirk, C.A., Glasgow, secretary—attended and addressed the meeting, after which it was resolved to form a branch of the Federation for Paisley and district, and a committee was appointed to prepare a constitution and report to another meeting.

MARLBOROUGH-PLACE, ST. JOHN'S WOOD.—The plot of land, about 14 acre in extent, at the western end of Marlborough-place, is offered for sale for building purposes. Having latterly served as an archery ground, it formed for many years the headquarters and drill-ground of the "Victoria Rifles," as formerly re-enrolled on August 4, 1853, with the Earl of Perth and Melfort in command. That corps, reconstituted as the "1st Middlesex," represents the "Duke of Cumberland's Sharpshooters," who alone, by a special Act, in their behalf, were exempted from the general disbandment of volunteer forces at the close of the Peninsular War, and in 1835 received the style of the "Royal Victoria Rifle Club."

THE BLUECOAT SCHOOL, WESTMINSTER.—In a "Note" on September 11 last we gave a brief account of this old school-house—the design has been attributed to Wren—and mentioned that under a scheme then just issued by the Charity Commissioners the building would remain for at least twenty-five years hence. The Commissioners, however, have framed a later and amending order, whereby the site and building will be sold, on behalf of the charity, for not less than 9,500*l*. to the Vestry of St. Margaret and St. John united parishes, and declaring that the Vestry, whilst declining to bind themselves to preserve the building, will endeavour to do so, if circumstances permit.

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.—The seventh annual meeting of this Association was held on the 18th inst., at the chambers of the Association, Bentinck-buildings, Wheeler Gate, when Mr. James Wright, the Vice-President, presided. Mr. Frank Hodson, honorary secretary, and Mr. J. W. Woodsend, the treasurer, respectively presented

their reports of the past year's work and finances, both of which showed that the Association is in a progressive and solvent state. The Hon. Secretary, while congratulating the members on the continued activity in the building trade, regretted the restless state of the labour market, and stated that notices had been received of further demands from the masons and labourers for an increased wage and shorter hours. Votes of thanks were passed to the officers for the past year. The following gentlemen were elected as officers for the ensuing year:—Mr. James Wright, President; Mr. William Edgar, vice-President; Mr. J. W. Woodsend, treasurer; Mr. Frank Hodson, hon. secretary. The President, Vice-President, and Hon. Secretary were deputed to attend the annual meeting of the National Federation of Master Builders' Associations of Great Britain, which was held in London on the 25th inst.

PROPOSED NEW LUNATIC ASYLUM, BIRMINGHAM.—On the 10th inst., Mr. H. F. Law, Local Government Board Inspector, sat at the Council House to inquire into the application of Birmingham City Council for sanction to borrow 10,000*l*. for lunatic asylum purposes; and also to borrow 12,510*l*. for the erection of a refuse destructor at the Montgomery-street Wharf. The Town Clerk (Mr. E. O. Smith) represented the Corporation.

THE VAULTING OF THE LOWER CHURCH, GLASGOW CATHEDRAL.—On the invitation of Mr. T. Watson, architect, the members of the Edinburgh Architectural Association visited the Cathedral last Saturday. The meeting was held in the sacristy, where Mr. Ross, the President of the Edinburgh Association, took the chair. Mr. Watson, who gave an address on the subject of his theory that the vaulting of the lower church was originally of a very different design to that now existing, prefaced his remarks by saying that he had called that meeting specially because of the following statement contained in the preface of the third volume of "The Ecclesiastical Architecture of Scotland," by Messrs. MacGibbon and Ross:—"Reference is made in Vol. II., p. 172, to Mr. T. L. Watson's theory regarding the vaulting of the lower church in St. Mungo's Cathedral, Glasgow. Having recently had the privilege, on the invitation of Mr. P. Macgregor Chalmers, of attending a meeting on the spot, when the usually obscure edifice was well lit up, and when it was shown by Mr. Chalmers that the points on which Mr. Watson based his opinion were untenable, we see no reason to believe that the beautiful design of the vaulting and the plan of the shrine were ever intended to be carried out in a mode different from that in which they are executed." In the course of his address, Mr. Watson withdrew the so-called original design which he had invented, and desired that attention should be directed solely to proving whether there had been an alteration or not. On the completion of the address, adjournment was made to the lower church, but the time was so limited that only a portion of the work could be examined. Mr. Watson, who still held by his theory, frankly admitted the errors into which he had fallen regarding the details upon which his theory rested, and commended the great accuracy of Mr. Chalmers's investigation, the result of which he had freely used. On the motion of Mr. Ross, seconded by Mr. Chalmers, Mr. Watson was thanked for his address. Before separating, Mr. MacGibbon said that as special reference had been made by Mr. Watson to the publication issued by Mr. Ross and himself, he felt that it was necessary to state that after the most complete and minute investigation conducted in his presence by Mr. Chalmers some time ago, he was convinced that this new theory was untenable, and nothing which had been said by Mr. Watson, and nothing which had been shown to them, made the slightest alteration in the opinion which he had then formed.—*Glasgow Herald.*

INTER-COMMUNICATION TELEPHONES.—The new "inter-communication" telephone, which has been invented and patented by Mr. J. D. F. Andrews, presents several novel features, and will be found useful in several cases, as, for example, when several rooms in a large building have to be connected together. The great advantage of this system is that it does away with the necessity of a central room for an "exchange," and as everything is automatic there will be a consequent great saving of time and labour. In order to call and be connected to a particular room all that it is necessary to do is to press a button. When you have finished your conversation, the mere act of hanging up the telephone receiver disconnects you, and leaves the instrument ready to be rung up from any of the other rooms. The instruments can also be fitted with indicators at slight extra cost, so that you can tell at a glance what room is ringing you up. Another advantage is that it is possible to call and speak to two or more rooms at once simply by pressing the buttons corresponding to these rooms simultaneously. Considering that the system does away with the expense of an "exchange" switchboard, as well as for the necessity of an attendant for it, the extra cost of the instruments is small. Messrs. J. D. F. Andrews & Co., Fulham Electric Works, London, the well-known manufacturers of accessories for concentric wiring, are the makers of these telephones.

SHEREWSBURY AND DISTRICT MASTER BUILDERS' ASSOCIATION.—The sixth annual dinner of the

Shrewsbury and District Master Builders' Association was held on the 10th inst. at the Lion Hotel, Shrewsbury. Mr. H. Farmer, the President for the year, occupied the chair. In the course of the proceedings Mr. C. Penn proposed the health of the President. So far as the building trade was concerned, he hoped in the future the masters and men would put their heads together, and, above all things, trust each other. The Chairman, in responding, said he hoped that as builders they would stick together in the future, for if they were not united they could not be successful. Mr. Gethin proposed "The Health of the Vice-Chairman." The Vice-Chairman said he considered that they should congratulate themselves on the result of the engineering struggle, because he felt that if the engineers had been successful, the builders, in common with other employers of labour, would soon have been face to face with a very serious struggle. Mr. Rhys proposed "The Master Builders' Association," coupled with the name of Mr. R. Price. In responding, Mr. Price said that by the aid of the Association they had been enabled to meet the men and come to reasonable terms with them. Since its formation they had had no lock-out strike, but it did not last long. When they formed the organisation it was thought that it was an Association to raise prices; but that was not the object. The object was to have an Association that could cope with the men's organisations, for they had found that, standing individually, the men's Associations were too strong for them. So far their Association had produced excellent results.

IMPROVEMENTS IN HALIFAX.—The Plummet Line Inn, Halifax, is shortly to be pulled down in order to carry out the extension of the improvement of Bull Close-lane. Mr. W. H. D. Horsfall, architect, of Halifax, has been entrusted with the preparation of the plans. The Halifax Licensing Bench have approved of plans, prepared by Messrs. Jackson & Fox, of Halifax, for the rebuilding of the White Horse Inn. The present structure, which is an interesting part of old Halifax, is shortly to be pulled down, in consequence of the improvement of Southgate, and the new inn will be erected at the rear of the present site.

THE CITY ARCHITECTSHIP, ABERDEEN.—The Corporation's Finance Committee have considered the remit as to the situation of City Architect, who is at present paid by fees. It was moved that a new official—to be called City Architect and Clerk of Works—be appointed to devote his whole time to the Town Council work, and to be paid by salary at the rate of 300*l.* per annum. The "previous question" was moved as an amendment, and was carried by eight votes to two, so that if the committee's recommendation be approved of, the position of Mr. John Rust, the incumbent of the office, will remain unaltered.

HOME ARTS AND INDUSTRIES ASSOCIATION.—The training classes held by this association at the Royal Albert Hall have now opened for the second term of the winter session. Book-binding, wood-carving, inlay, cut leather work, basket-making, &c., are taught. Particulars can be obtained from the secretary.

A KITCHEN REFUSE DESTROYER.—Mr. J. B. Pether (Yeovil) sends us a description and section of his patented kitchen range, with a special provision for the burning of kitchen and house refuse, which is often a difficulty in the economy of the kitchen. The ashpit of an ordinary range is enclosed, making a chamber into which the refuse is placed to be dried by the heat of the fire; all greasy or fatty matter is effectually absorbed by the ash falling through the fire-bars, and, when everything is reduced to a combustible condition, it is shovelled into the fire. A constant in-draft is ensured by means of holes in the door of the destructor, whereby the fumes are carried up through the fire, and thence into the chimney. This, with the close and accurate fitting of the door, prevents the escape of any vapour or smell into the kitchen.

FIREPROOF CONSTRUCTION.—At the Society of Arts meeting on Wednesday night, Mr. Thomas Potter, of Messrs. Potter & Co., read an interesting paper on "Fire-proof Construction with special regard to domestic buildings." Sir Douglas Straight presided. Though a manufacturer, and thus specially interested in his particular system of fire-proofing, Mr. Potter showed considerable tact in avoiding any reference to his own work, and this feature of his paper very rightly called for comment in the course and the discussion that followed. Mr. Potter, however, was too strong an advocate for fire-resisting construction in the ordinary dwelling-house, for there is no doubt that the British public will prefer fire risks to discomfort, and discomfort we surely would have if wood-work were to be almost entirely banished for cement and similar materials. Perhaps one of the most notable features of the paper was a strongly-expressed opinion in favour of the independent testing of fire-resisting materials, and this point was also taken up in the discussion, which was opened by Mr. H. H. Collins, the President of the District Surveyors' Association, followed by Mr. Edwin O. Sachs, the Chairman of the British Fire Prevention Committee, Mr. Gamble of the Metropolitan Fire Brigade, and several others. Mr.

Collins primarily referred to detail construction, Mr. Sachs to the testing of materials, and Mr. Gamble to the experience of firemen in certain forms of construction. The Chairman in summing up laid special stress on the broader aspects of fire prevention, the necessity of tests, and the importance of the subject generally to the metropolis.

THE SANITARY INSTITUTE.—The Council have accepted an invitation from the Lord Mayor and City Council of Birmingham to hold its seventeenth congress and exhibition in that city in September next.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The monthly meeting of this Society was held on the 10th inst. in their library at the Museum, Queen-street, Edinburgh.—Mr. J. Balfour Paul, Lyon King of Arms, Vice-President, in the chair. The meeting was entirely devoted to the reports on the excavation of the Roman station at Ardoch, in Perthshire, undertaken by the Society in 1896-97. Operations were begun early in the summer of 1896, and continued till May in the following year. Mr. Thomas Ely, who had held the same post at Birrens, was again in charge as clerk of the works, and the secretary (Mr. D. Christison) described the fortifications, which, owing to a complexity unknown in other Roman works at home or abroad, have given rise to much speculation. But as no trace of occupation subsequent to that of the Romans had been revealed by the excavations, the fortifications, complex as they are, must be regarded as the outcome of Roman military engineering. The chief cause of the complexity seems to be the great difference in the width of the fortifications on the four sides owing to the variety in the natural strength of the sides. These variations in width necessitated modifications at the angles to make the sides fit in to each other. The enclosed area, which is a rectangular oblong with the north-east corner measures about 450 ft. by 400 ft., and the width of the fortifications on the north is about 280 ft., on the east 200 ft., and on the south and west (where they are much destroyed) about 130 ft. and 90 ft. Only three of the lines—the inner rampart with its berm and two ditches in front—are carried round the whole four sides. On the east face, besides the inner rampart with its berm, the lines consist of five parallel trenches 8 ft. to 9 ft. deep, separated by ridges, with a wide platform beyond them and a rampart outside of all. On the north face there is more complexity, partly from the cause referred to, and partly from the introduction amidst the trenches of two long-shafted works or ravelins capable of separate defence. The east entrance runs straight across the trenches on a level with the tops of the ridges between them, and passing through the outer and inner ramparts. It had been protected by an angled projection of the fifth trench in front of it, and barred by an outer, middle, and inner gateway. The north entrance did not traverse the three outer trenches, which were probably crossed by a removable wooden gangway. This was the side on which attack was most dreaded. The rampart was too high and broad to be defensible except from the top, which would doubtless be palisaded as well as the other lines. Their unwieldy multiplication was probably due to the necessity for great strength in a station so completely isolated, and at a distance of two days' march beyond the utmost lines of the Roman Empire. Mr. J. H. Cunningham, C.E., the treasurer of the Society, next gave a detailed account of the methods of exploration of the earthworks and trenches, and described the buildings which covered the trenches and the ramparts. Sections cut across the ramparts at selected points showed that the main rampart had a foundation course of stones, as had been previously found at Birrens and in the case of the Antonine Wall. The body of the rampart itself consisted of layers of gravel, separated from each other by thin layers of black material, peat, or the remains of sods or brushwood, and traces of rude stonework were often found close to it on the inside. The whole of the north-eastern quarter of the interior area was thoroughly explored so as to show the nature of the constructions composing the station buildings of wood and stone. The plan of the buildings was disclosed in a curious manner. In one of the cuttings at the commencement of the explorations Mr. Ely, the clerk of works, detected several round holes, about 10 in. in diameter and 30 in. deep, some empty and some partially filled with a fine powdery soil, quite distinct from that of the surrounding subsoil. A flat stone was generally found in the bottom, and the sides consisted of a packing of stones. The holes were perceived to occur in lines and at pretty regular distances apart, and when the search for them was completed they stood revealed as the post-holes of the framework of a series of wooden buildings which covered the interior area, laid out in rectangular blocks intersected by gravel roads, and many of them gravel-floored. The plan thus made out showed a general configuration of the buildings and principal streets closely resembling that of Birrens. In several places, however, stone foundations of long narrow buildings, with air-channels or heating flues underneath, were found among the wooden structures, but greatly dilapidated and retaining scarcely any features of architecture. Indeed, the only building within the area which retained any archi-

tectural features was a mediæval chapel near the centre of the area, whose ruins, surrounded by those of the square enclosure of its burying-ground, have been described by many writers on Ardoch as the Pretorium of the Roman Camp.—Mr. Thomas Ross, architect, in describing this part of the excavation, said that though not mentioned in any cartulary, and quite forgotten in the district, it was referred to by Baron Clerk in the end of last century as a chapel and a burial-place still used by the country people, which Dr. Marshall confirmed in his "Historic Scenes of Perthshire," and the slight remains revealed by the excavations show that it was a chapel about 40 ft. long, probably with a north aisle, like the chapel at Moncreiff, and its other features similar to those of many of the country chapels found throughout Scotland. Dr. Joseph Anderson described the pottery, bronze, and other objects found in the course of the excavations. The relics found at Ardoch were generally of the same nature as those from other sites of Roman occupation, consisting of articles of glass, pottery, bronze, iron, and lead, with a few coins, and a very few fragments of sculptured tablets, bearing inscriptions, and fragments of architectural decoration. The coins found range from the time of Nero, A.D. 54, to that of Hadrian, A.D. 117. The few fragments of inscriptions found add nothing to our knowledge of the date of occupation, the only thing certain being that it must have been occupied after A.D. 117, though there is nothing to show when the occupation actually commenced.—*Scotsman.*

BISHOP ELLICOTT MEMORIAL REREDOS, BRISTOL CATHEDRAL.—The new stone reredos, which is to be placed in Bristol Cathedral, will be more than 17 ft. wide, and it will rise to a total height of 27 ft. from the floor of the sanctuary. The lower part behind the altar will consist of a plain, with a centre panel to enclose the altar cross; on either side of the upper half of this panel is an enriched arcade of four divisions. Above this lower part the centre portion (which takes the width of the altar and is about 10 ft. wide) is corbelled boldly forward, and to the right and left of this there are enrichments behind the altar upwards of a tier of tracery, surmounted by niches, with figures of Old Testament saints on the left, and New Testament saints on the right. Above the level of the top of the corbelling the whole of the reredos has one general treatment of wide niches in one, two, and three tiers, with canopies and pinnacles, separated by narrower features, also enriched with niches and sculpture. The Crucifixion, with SS. Mary and John, occupies the centre niche. Other niches contain figures of saints and angels, with their emblems. The lower part of the back or eastern side of the reredos is also panelled up to a height of 14 ft., and above this it is divided up by a series of niches. The centre one contains a representation of the Presentation in the Temple, and on either side of this St. Mary and the Archangel Gabriel (representing the Annunciation). There are other niches containing figures of saints and angels. A panelled and traceried screen, 11 ft. high, with buttresses and pinnacles, separates the eastern bay of the choir from its eastern chapel flanking the reredos on either side. The order to proceed with the reredos was given shortly before Mr. Pearson's death, and the work will be carried out under the supervision of his son.—*Western Press.*

THE GUILDHALL LIBRARY AND THE CORPORATION.—At a meeting recently of the Court of Common Council it was resolved to expend a sum of 700*l.* upon general repairs of the Corporation Library, Guildhall, and the rearrangement of the reading room. At that Court the agenda included, for the first time, some business hitherto devolving upon the Commission of Sewers, which body, now merged in the Public Health Department of the Common Council, was appointed after the Great Fire and was finally dissolved on January 1st last.

CAPITAL AND LABOUR.

WAGES IN THE LEEDS BUILDING TRADE.—The masters engaged in the Leeds Building Trade have been asked to grant certain advances in wages, and an alteration of working rules to four branches of the industry. The masons have tendered a six months' notice, which expires on May 1, for an increase of wages from 8½d. per hour, and a concession of a region to working rules. A similar request has been made by the joiners, whose present remuneration is at the rate of 8½d. per hour. The operative plumbers now seek an advance of 1d. per hour upon their present rate of wages, which is 8d., their notice terminating on June 1. The plasterers in their turn apply for an increase from 8½d. per hour, and a concession of a region to working rules. A similar request has been made by the bricklayers, who are asked for an increase of 1d. per hour to the latter, with another ½d. in September, 1897. As far as can be gathered at present, the

ceiling amongst individual employers is that favourable consideration should be given to the claim of the masons, but that the application of the joiners should be refused, as they obtained an advance in 1895. The masters feel that nothing will induce them to grant the full demands made upon them, there is a feeling among the masters for a combination on the lines of the Engineering Federation.—*Leads Evening Express.*

THE DISPUTE IN THE PLASTERING TRADE, LIVERPOOL.—The decision of the Lord Mayor of Liverpool, Alderman John Houlding, as arbitrator in the prolonged dispute between the master plasterers and the operative plasterers of Liverpool has been given. The arbitrator says:—"I consider that all boys entering the trade should be apprenticed for five years. That they should be bound before they are sixteen years of age, as they are legally entitled to leave on attaining the age of twenty-one. That unbound apprentices who have been working since they were sixteen should be bound for the remainder of their term, i.e. until they arrive at the age of twenty-one, but such apprentices shall be included in the limitation named in the next paragraph. I decide that a limitation should be put upon the number of apprentices employed, but, in view of present contracts, the limitation should not be made at once. That on and after July 1, 1898, no master shall employ more than ten bound apprentices, but up to July 1, 1899 he may employ in addition unbound older boys to a number not exceeding five. I decide that six months' notice shall be given on either side, such notice to expire on March 1. My reason for making the above rule is, that it would be decidedly unfair for the masters to give a notice to expire in the months of November or December when work is slack, whilst on the other hand it would be equally unjust for the men to give a notice expiring on the 1st May, when the masters require every assistance to enable them to complete their contracts. I decide that the rule regarding country work shall read as follows:—Men working above three miles from the boundary, and under twenty miles from town, to have 3s. for lodgings per week, and expenses in and out once a fortnight. If more than twenty miles and under thirty-five miles from town to have 4s. for lodgings per week and expenses in and out once a month; beyond that distance to be a matter of arrangement as far as concerns the time for coming in. Men working in the country to leave by the train or other conveyance after starting time, and return by that nearest to leaving off time."

ABERDEEN MASONS.—In the building branch of the United Operative Masons and Granite-Cutters' Union, the weekly subscription is to be increased from 2d. to 3d. The stone-cutters in the monumental branch have resolved to demand an increase from 6d. to 7½d. per hour. Employers having intimated a reduction in the rates paid to operative granite-polishers for piecework, the men have voted for payment by time instead of by piecework.

LEGAL.

DISPUTE BETWEEN THE COUNTY COUNCIL OF DORSET AND A FIRM OF BUILDERS.

The case of the County Council of Dorset v. Belcher, Eason, and Westwood came before the Court of Appeal composed of Lords Justices A. L. Smith, Chitty, and Collins, on the 24th inst., on an application by the appellants, the County Council of Dorset, for leave to appeal from the decision of a Divisional Court, consisting of Mr. Justice Day and Mr. Justice Lawrence, refusing leave to appeal. It appeared that the appellants claimed 250*l.* for the expenses incurred in repairing the damage to certain roads caused by extraordinary traffic. Messrs. Pethick & Co., the respondents, were the builders of an asylum, and they contracted with a man who owned carts, trolleys, &c., that he should cart their materials from the railway station to the place where the building was being erected, and this carting caused the damage to the roads. The Divisional Court held that the respondents were not liable upon the authority of the decision in the case of the Kent County Council v. Lord Gerard.

Mr. Joseph Walton, Q.C. (with him Mr. Clavell Salter), on behalf of the appellants contended that the case cited did not apply, as there the materials which were carted over the roads did not belong to Lord Gerard, whereas in the present case the materials belonged to the respondents, and whether they carted them or employed a contractor to do so would make no difference.

Mr. C. A. Russell, Q.C. (with him Mr. H. E. Duke and Mr. Preston) on behalf of the respondents, contended that the case cited had been served upon them, whereas it should have been made *ex parte*.

Their Lordships gave leave to appeal, and reserved the costs of the application. They pointed out that such applications should be always made *ex parte*, and if the Court desired the other side to be heard they would direct notice to be served upon them.

MEETINGS.

FRIDAY, JANUARY 28.

Institution of Civil Engineers (Students' Meeting).—Mr. H. Williams on "Condensing Apparatus." 8 p.m.

SATURDAY, JANUARY 29.

Royal Institution.—Professor Patrick Geddes on "Cyprus." 3 p.m.

London and Provincial Builders' Foremen's Association (Memorial Hall, Farringdon-street).—7.30 p.m.

MONDAY, JANUARY 31.

Society of Arts (Antarctic Lectures).—Mr. Cyril Davenport on "Decorative Bookbinding." 11. 8 p.m.

Surveyors' Institution (Students' Meeting).—Mr. F. A. Green on "Compensation Cases." 7 p.m.

TUESDAY, FEBRUARY 1.

Institution of Civil Engineers.—Further discussion on Mr. W. L. Strange's paper on "Reservoirs with High Earthen Dams in Western India." 8 p.m.

WEDNESDAY, FEBRUARY 2.

Royal Archaeological Institute.—(1) "Further Notes on the Rose, and Remarks on the Lily," by Mr. J. Lewis André, F.S.A.; (2) "Pit Habitations," by Mr. J. R. Montmer, 4 p.m.

Society of Arts.—Mr. Jules Fuest on "The Cinematograph." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Northern Architectural Association.—Mr. Geo. B. Bulmer, of Leeds, will read a paper entitled "To Ancient Rome," illustrated by lantern views. 7.30 p.m.

British Archaeological Association.—Mr. J. Chalkley Gould on "A MS. Temp. James II." 8 p.m.

THURSDAY, FEBRUARY 3.

Society of Antiquaries.—8.30 p.m.

Institution of Civil Engineers.—Students' visit to the London and South-Western Railway Locomotive Works, Nine Elms. Assemble at the Locomotive and Stores Department Gate, Wandsworth-road. 2.30 p.m.

FRIDAY, FEBRUARY 4.

Architectural Association.—Mr. John Belcher on "Hampton Court Palace," illustrated by lantern views. 7.30 p.m.

Royal Institution.—Mr. Alan A. Campbell Swinton on "Some New Studies in Cathode and Röntgen Radiations." 9 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "Electro-Magnetic Brakes and their Capabilities," by Mr. Louis H. Walter. 8 p.m.

SATURDAY, FEBRUARY 5.

Architectural Association.—First Spring Visit, to five houses in the vicinity of Park-lane, W. (see advertisement on front page).

Royal Institution.—Professor Patrick Geddes on "Cyprus." 11. 3 p.m.

London and Provincial Builders' Foremen's Association.—Annual Dinner, Holborn Restaurant. 7 p.m.

British Institute of Certified Carpenters.—Visit to Messrs. Spence's new premises, St. Paul's Churchyard, at 7 p.m. Meeting at 6 p.m. Paper by Mr. G. Ellis, entitled "Some Account of the Structure of Timber."

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until March 1.

[1896]. 29,715.—JOINTS FOR TUBULAR STRUCTURES: Belcher, Eason, and Westwood.—The invention, stated to be particularly applicable to aluminium and alloys when bracing is difficult or impracticable, consists in making a joint by drawing the tube, whose end is split, into a tapered socket, and forcing the divided portions apart, so as to fix them in the tube; or drawing the tube into the lug tapered in the opposite direction, and forcing its split ends together about a plug. Other modes may be employed in which the tube-ends are forced apart by screws, or an eccentric bolt is moved lengthwise into the tapered excess of the lug—the tube ends in this case being not split.

[1895]. 29,094.—DRAIN TRAPS AND THE LIKE: G. R. Gregory.—The contrivance comprises an inner tube, a loose ball, and an outer globe-shaped casing (for the ball); the inner tube is cut square at its end, just above which some holes are made; at the base of the globe is cut a hole equal to the inner tube's inside diameter, wherein the ball rests. The tube and globe are intended to hang from the top of the outlet or trap used in sanitary work to protect the seal and for other purposes when there is air suction. The ball, to float in water, may be made of metal, wood, glass, earthenware, or rubber.

[1895]. 30,012.—LAVATORY OR CABINET STAND WASH-BASINS: H. Swellings.—The flat surfaces of the basins are fluted, corrugated, or grooved, in order to convert the surfaces into large soap-trays, a raised rim retaining the soap. Plugs, washers, and chains are dispensed with by forming the basin with an outlet which leads into a separate chamber raised to top level of the basin, and has a valve-spring resting upon it. This water-trap acts as an overflow, and the lifting of the valve sets up a syphonic action which discharges the contents of the water-bowl.

NEW APPLICATIONS.

For the week ending January 15.

627, J. H. Gray, an Apparatus for Measuring Distances on Maps, &c. 636, H. P. Fletcher, Fibrous Plastering 637, A. S. Douglas, Astragals for Use in Glazing. 642, W. Dunham, Setting-out Curved Fences for Gas and Water Main Pipes, and Making Connections with other Mains. 658, J. McHardy, Wood-cutting and Working Machinery. 664, E. Toussaint, Waterproof Coating for Walls, &c. 669, H. F. Lamock, for Treating Natural Alabaster. 680, A. E. Bennett, Coating Metal Work. 684, W. A. Oakley, an Artificial Stone. 690, G. Warburton, and 1,152, C. H.

Collins, Bricks for Building and other purposes. 695, Grouvelle & Arquebourn, Distribution of Steam for Heating. 708, O. Wink, and 709, T. B. Anderson, Door and similar Latches. 731, J. Bousfield, a Roller Frame for Sliding-Doors. 767, E. Gibson, Drying of Bricks, &c. 777, H. Verschoor, in Menten, Locks. 778, J. H. Sutton, Gullies. 784, A. Inman, Ladders employed in Building Construction, &c. 785, W. H. Cranstone, Self-sustaining Hoists and other Lifting Apparatus. 786, W. T. Warne, an Automatic Gas Cut-off. 790, Milo & Weber, Deco-Grating Wood with Designs. 792, the Earl of Dundaonald, Portable Stoves. 799, J. H. Smith, to Prevent the Spread of Fire in Buildings. 804, W. K. Seward, a Window-sash Lift and Fastener. 815 and 1,117, W. Price, Tiles and the like. 820, H. H. Ormandy, Self-applying Brushes. 820, Vaughan & Sutton, Flexible Pipe-connections. 822, H. H. Lake, a Substitute for Wood or Stone. 827, A. E. Crawford, for Delivering Water to Closets and the like. 830, H. H. Lake, a Compound for Use in making Pottery, Bricks, &c. 840, W. Potter, Window-sash Fasteners. 850, Walsley & Ashford, Heating of Buildings. 861, J. Marshall, a Combination Angle and Depth Gauge. 872, A. Hill, a Chimney Pot. 885, Mary Mellor, Domestic Fire Grates. 890, F. H. Mingay, and 905, J. C. Harvey, Tape. 903, J. J. Cresswell, an Inlet Ventilator. 914, R. G. Green, an Elevator. 923, W. A. Rees, Combustion of Fuel in Fire Grates, &c. 929, W. G. Newton, a Window and Door Fastener. 944, F. P. Candy, for Separating Water from Sewage Sludge and other Fluid Mixtures of Matters. 945, E. Meier, Door Fasteners. 991, A. Chassagne, and 1,016, Mitchelmore & Goodwin, joints or Closing Devices for Pipes, Covers, &c. 993, O. Wheeler, Ventilating Warm Air Fire Grates. 1,002, Voysey & Wilson, Electricity Measuring Instruments. 1,020, F. E. Preschlin, a Flanged Pipe Joint. 1,029, S. Oppenheim & Co., Grinding Machines. 1,036, Kinsella, Locks. 1,050, J. Atherton, a Draught, Dust, and Weather Excluder for Doors, &c. 1,077-8, E. Taylor, Attaching Door and other Knobs to spindles. 1,087, Beyer & Recker, a Kiln. 1,105, L. West, Cutting Designs on Glass. 1,109, H. M. Guitierrez, Ladder Fire Escapes. 1,115, T. Cooke, Domes for Observatories and the like. 1,124, A. W. Turner, a Flush-joint for Tubular Connections. 1,134, J. Thomson, Water Meters. 1,161, W. Westwood, Stone Blasting and Cutting. 1,170, J. Archibald, Protection of Water Cisterns, Main Supply Pipes, and the like, from Frost. 1,177, L. P. Ford, Artificial Stone and Concrete. 1,179, Lenz & Stumpf, Windows. 1,190, J. Williams, a Cowl or Ventilator. 1,192, W. A. Watts-Jones, Disinfecting Apparatus. 1,195, H. Kienast, Measuring Instruments and Devices. 1,197, C. Branzke, a Boundary and Sighting Stone. 1,200, H. Rous, a Fireproof Composition for Building Purposes. 1,212, A. Wolheim, Automatic Syphons.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 14.—By A. J. SUEFIELD.
Hackney.—44, Morpeth-rd., u.t. 55 yrs., g.r. 6*l.*..... 225
6, Bishop-rd., u.t. 47 yrs., g.r. 5*l.* 5*s.*..... 240
Poplar.—15 and 16, Ivy-cottages, u.t. 45 yrs., g.r. 5*l.* 10*s.*..... 240
January 18.—By DEBENHAM, TEWSON, & CO.
Kensington.—18, Duke's-lane, f. r. 104*l.*..... 910
Totterham.—48, 50, and 52, Harrington-rd., u.t. 85 yrs., g.r. 10*l.*, r. 78*l.*..... 370

By WESTON & SONS.
Haverstock Hill.—No. 154, "The Haverstock Arms and Tavern," f. r. 100*l.*..... 4,800
No. 152, peppercorn g.r. reversion in 25 yrs. 480
No. 150, g.r. 10*l.*, reversion in 80 yrs. 340
Streatham.—72, 74, 76, and 78, Wellfield-rd., u.t. 65 yrs., g.r. 10*l.*..... 740

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).
High Holborn.—"The White Horse" p.h., u.t. 69½ yrs., r. 25*l.*, with goodwill 38,000

By ALFRED FREER (at Camberwell).
Peckham.—85 and 93, Lower Park-rd., u.t. 79 yrs., g.r. 5*l.* 10*s.*..... 390
Camberwell.—7 and 11, Maude-rd., u.t. 57 yrs., g.r. 12*l.* 12*s.*, r. 78*l.*..... 700
2, Fearnley-rd., u.t. 66 yrs., g.r. 6*l.* r. 28*l.*..... 235
30, Cambridge-st., u.t. 50 yrs., g.r. 3*l.* 10*s.*..... 250

January 19.—By H. E. FOSTER & CRANFIELD.
Brompton.—10, Beauchamp-pl., u.t. 20 yrs., g.r. 8*l.*, r. 70*l.*..... 510
Fulham-rd., i.g.r. 35*l.*, u.t. 15 yrs., g.r. 8*l.*..... 250
Battersea.—Church-rd., i.g.r. 8*l.* 8*s.*, u.t. 40½ yrs., g.r. nil 150
Marylebone.—29, 30, and 31, Harcourt-st., u.t. 8 yrs., g.r. 80*l.*, r. 150*l.*..... 300

By DOUGLAS YOUNG & CO.
Tulse Hill.—Upper Tulse Hill, "Woodside," u.t. 51 yrs., g.r. 7*l.* 7*s.* 6*d.*..... 670
Wandsworth.—14, Smeaton-rd., u.t. 7½ yrs., g.r. 5*l.*..... 170
Herne Hill.—158, 160, and 162, Railton-rd., u.t. 68 yrs., g.r. 18*l.* 18*s.*, r. 108*l.*..... 930
Hford.—41 and 42, Ley-st., f. r. 52*l.*..... 500

By PHILLIPS, LEA & CO. (at Bournemouth).
Bournemouth, Hants.—Old Christchurch-rd., "Hindhead," f. r. 90*l.*..... 1,460

By WOOTTON & GREEN.
Bow.—33, Eglington-rd., f. r. 35*l.* 10*s.*..... 415
Commercial-rd., East.—43, 45, and 47, Anthony-st., u.t. 12 yrs., g.r. 7*l.* 10*s.*, r. 78*l.*..... 375
17 and 18, Fenton-st., u.t. 12 yrs., g.r. 4*l.*..... 145
Totterham.—35, Northumberland-grove, u.t. 50 yrs., g.r. 8*l.*, r. 28*l.*..... 210

January 21.—By DRIVERS (of Holloway).
Holloway.—45, Crayford-rd., u.t. 7½ yrs., g.r. 7*l.*, r. 40*l.*..... 505

By FIELD & SONS.
Old Kent-rd.—Site of Nos. 43 to 55 (odd), two building leases for 80 yrs., at per annum 189
Aberdour-st., area 7,650 ft., a building lease for 80 yrs., at per annum 109

Contractions used in these lists.—F.g.r. for freehold ground-rent; i.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estate-rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, viii. & x. Public Appointments, pp. xviii. & xxi.

* Accepted, to which has to be added £4,156, the lowest tender for the terra-cotta work, making £25,000.

LONDON.—For repairs at the "Ten Bells," Commercial-street, E. for Messrs. E. J. Rose & Co. Messrs. Edward Brown & Son, surveyors, Commercial-street, Rotherhithe—
 T. V. Kiddie & Son.....£79 0
 C. E. Todd & Co.....185 0
 J. & W. T. Inkpen.....165 0
 * Accepted.

LONDON.—For alterations to the "Albany," Portland-street, W. Messrs. Gordon, Lowther & Gunton, architects—
 Jarvis.....£7 50
 Halfway.....7 45
 Artill.....7 30
 Sibley.....7 30
 Fatman & Frothingham.....7 30
 * Accepted.

LONDON.—For the erection of four houses and shops, Port-avenue, for Mr. J. Carson, Mr. J. P. McGrath, architect, Foyls-street, London—
 J. A. Fulton.....£368 0
 Sharrin & Rutledge.....497 0
 John Gough & Co.....370 0
 W. J. Mansfield.....370 0
 [All of London.]

LONDON.—For the erection of four dwelling-houses, Rye-street, for Mrs. Fanning, Mr. J. P. McGrath, architect, Foyls-street, London—
 J. A. Fulton.....£410 0
 W. J. Mansfield.....500 0
 Sharrin & Rutledge.....410 0
 D. Gillespie.....410 0
 [All of London.]

PEMBROKE.—For the erection of schools, Monkton, for the School Board of Pembroke, Mr. Kenneth McAlpin, architect—
 William Davies.....£270 0
 Davies & Morgan.....270 0
 * Accepted.

RADCLIFFE (Lancs.).—Accepted for the erection of buildings, &c. (Contracts 1 and 2), for the Urban District Council—
 No. 1 Contract,
 Building—John Allen, Radcliffe.....£3,747
 No. 2 Contract,
 Engineering—John Wolstenholme, Radcliffe.....£1,365

SPRINGFIELD (Essex).—Accepted for the erection of a garage, Mount Hill-road, Springfield-road, for Mr. J. C. Smith, Mr. Geo. E. Clare, architect, 60, Duke-street, Chelmsford—
 H. Potter, Chelmsford.....£588 10 0

WEST HAM.—For making-up Upton-avenue, Dorset-road, and other roads and streets, Forest Gate, Canning Town, and Custom House, for the Corporation, Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.—
 Private Street Works—Contract No. 1,
 J. Jackson.....£1,335 5 5
 W. Griffiths.....1,335 5 5
 Contract No. 2,
 W. Griffiths.....£4,470 15 5
 J. Jackson.....4,470 15 5
 Green (accepted).....£3,964 4 8

WEST HAM.—For wood paving, West Ham-lane, for the Town Council, Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.—
 Wood Paving, West Ham-lane,
 W. Manders.....£440 10
 Acme Wood Flooring Co. 434 0
 W. Griffiths.....434 0
 * Accepted.

LONDON SCHOOL BOARD TENDERS.

The following lists of tenders were submitted by the Works Committee at the last meeting of the London School Board—

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 J. Grover & Son.....2,484
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 Limmer Asphalt Co.—1 in. thickness of asphalt. 5 years guarantee. 138 11 0
 Val de Travers Co.—1 in. thickness of asphalt. 128 7 3
 Messrs. Hobman & Co.—1 in. thickness of Limmer asphalt. 5 years guarantee. 93 0 0
 Imperial Stone Co.—14 in. thickness of petrosilico. 5 years guarantee. 110 0 0

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W. N. W. (Below our limit) J. F. W., J. S. M., E. & C. (Amounts should have been stated).
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The Builder.

VOL. LXXIV. No. 2872.

FEB. 5, 1898.

ILLUSTRATIONS.

Houses and Flats, Chelsea Embankment.—Mr. Delissa Joseph, F.R.I.B.A., Architect	Double-Page Ink-Photo.
Clare College, Cambridge (R.I.B.A. Medal Drawing): Measured and Drawn by Mr. T. Tyrwhitt	Two Double-Page Photo-Lithos.
Design for a Small Country Church (Grissell Medal Drawings): By Mr. Harbottle Reed	Double-Page Ink-Photo.

Blocks in Text.

New Sedilia for Cheltenham College Chapel.....	Page 127	Houses and Flats, Chelsea Embankment.....	Page 132
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Rate of Mortality among Architects and Building Artisans.



"Old Mortality," in years gone by, used to find congenial labour in re-lettering the crumbling Cameronian gravestones in the quiet kirkyards, so to-day men put their

hearts into the compilation of statistics of the diseases and deaths which have overtaken their fellow men. Doubtless, Old Mortality moralised as he worked, and deduced some good from his labours. So do the statisticians of our own day, although their labours do not carry them to country graveyards with green mounds and yew trees and a grey old church.

Several facts and lessons of importance may be learnt by men of all occupations, and of none, from a careful perusal of the Blue Book by Dr. Tatham, entitled "Supplement to the Fifty-fifth Annual Report of the Registrar-General of Births, Deaths, and Marriages in England." Part II. of this supplement was published recently, and we propose to consider those portions of it which deal with architects and with men engaged more or less directly in building operations. In doing this, it will be useful to point out in what respects the diseases to which men in these occupations succumb differ from those of working men generally, using the term "working man" in its widest sense. At the outset, however, a difficulty arises, owing to the classification adopted by Dr. Tatham. Architects are not placed in a class by themselves, as are clergymen, medical men, and "the law," but are bracketed with artists (meaning, we presume, painters and draughtsmen), engravers, and sculptors. Whenever, therefore, architects are referred to hereafter, the word must be taken to include also these other branches of artistic work.

This difficulty does not present itself to the same extent in respect of men engaged in the several branches of the building trade, as the most important of these are formed into separate classes, namely: 60, bricklayer, mason, builder; 61, carpenter, joiner; 62, slater, tiler; 63, plasterer, whitewasher,

paperhanger; 64, plumber, painter, glazier; 65, cabinet maker, &c.; and 66, sawyer. When, however, we come to consider what we may call the preparatory and subsidiary trades, we again find a certain amount of confusion in the classification; thus, "locksmith, bellhanger, and gasfitter" are classed together, as are "blacksmith and white-smith," and the workers in "nail, anchor, chain, and other iron and steel manufactures." This grouping of trades could not have been avoided except by increasing the century of classes to which Dr. Tatham limited himself.

Dr. Tatham has improved upon the reports of his predecessor, Dr. Ogle, by further subdividing the causes of death, so that in these tables, instead of only thirteen headings, there are twenty-four. This, of course, while rendering rapid inspection and generalisation rather more difficult, adds to the value of the Report. Another important feature is the calculation of the rates of mortality for successive periods of life—namely, for the

and of these 9 died during that period, or 3 per annum, which gives a mean annual mortality of 2.31 per 1,000; during the same three years there were 4,943 architects, &c., between the ages of 25 and 35, and of these 83 died, or 27.6 per annum, giving a mean annual death rate of 5.60 per 1,000. In his tables, Dr. Tatham, instead of dividing the deaths by the number of years (3), as we have done, multiplies the lives by 3, and thus arrives at the same result. The following table has been compiled from the first table in the report, and includes statistics for "all males" and "all occupied males," in addition to the figures relating to the profession and trades forming the subject of this article; for further purposes of comparison, the rates of mortality for the three "learned" professions—the church, law,* and medicine—have also been included. The mortalities, however, are only given for ages above 25, as it is only then that the actual effects of occupation will, as a rule, begin to be seriously felt:—

Mean Annual Mortality of Males per 1,000 engaged in different occupations in the three years 1890-91-92, at successive periods of life:—

Ref. No.	Occupation.	Age 25-35.	Age 35-45.	Age 45-55.	Age 55-65.	Age 65 and upwards.
	All Males	7.67	13.91	21.37	39.01	103.56
	All Occupied Males	7.29	12.43	20.66	36.66	102.32
1.	Clergyman, priest, minister	4.23	5.18	10.52	25.35	83.60
2.	Barrister, solicitor	5.32	10.67	17.72	34.50	111.74
3.	Physician, surgeon, &c.	0.60	14.92	21.04	34.10	112.40
4.	Architect, sculptor, &c.	5.60	8.61	19.28	30.53	90.23
5.	Locksmith, bellhanger, gasfitter	6.52	12.03	22.22	33.88	90.79
58.	Iron and steel manufactures	8.81	15.81	28.50	55.30	157.04
59.	Copper, tin, zinc, lead, brass, &c., worker and dealer	7.43	13.98	24.55	46.02	119.22
59a.	Lead worker	12.14	22.78	37.62	75.32	281.25
60.	Bricklayer, mason, builder	6.55	13.45	22.04	40.23	107.71
61.	Carpenter, joiner	5.78	9.36	17.10	32.15	102.20
62.	Slater, tiler	11.01	17.17	27.53	50.28	128.21
63.	Plasterer, whitewasher, paperhanger	6.93	13.77	22.17	48.57	89.71
64.	Plumber, painter, glazier	7.04	14.79	25.13	45.58	107.10
65.	Cabinet-maker, &c.	6.84	13.98	21.11	38.72	101.16
66.	Sawyer	4.84	9.54	15.44	35.32	126.05
80.	Stone, slate—quarrier	7.43	14.49	25.29	51.05	144.84
93.	Brick, tile—maker, burner	4.92	8.02	15.98	34.15	112.01
95.	General labourer	9.64	16.85	27.70	42.43	116.03

two quinquennial periods between 15 and 25, for the four decades between 25 and 65, and finally for all ages above 65. An example of this method of calculation and classification will be useful. In the three years under consideration, 1890-1-2, there were 1,297 architects, &c., between the ages of 15 and 20 (as enumerated at the census of 1891);

From this table it appears that the mortality of the class which includes architects is considerably below the average at every age, although the ten years from 45 to 55 appear the most critical. In comparison

* This refers to barristers and solicitors only; "law clerks" are placed in a separate class, and show (as might be expected) a much higher rate of mortality.

with other professions, the artists have nothing to regret except in the case of clergymen and ministers. Between the ages of 25 and 55, the sawyer, carpenter and joiner, brick and tile maker and burner, have even a lower rate of mortality than the artist, but above that age the positions are changed. The bricklayer, mason, and builder is remarkably near the general average for "all males," but the balance is against him when compared with the average of "all occupied males." The slater and tiler has an unenviable mortality at all ages, and the quarryman above 55 years old is even worse; but the metal-workers are in the worst plight, the mortality of lead-workers having been, during every period, about double the mortality of "all occupied males." As might be expected, the general labourer has rather a bad time of it, although better all round than the slater and tiler.

It is, however, when we come to look at the diseases to which the deaths in the several occupations are due, that something may be learnt of really practical use. The class of artists, architects, &c., which, at the last census, numbered 16,944 males above 15 years of age, suffers from alcoholism less than the average, but more than the average from diseases of the liver. Diabetes claims from among them twice as many victims as from the same number of average workers, but, as the deaths from this disease are only 17 out of 778 deaths between the ages of 25 and 65, it does not count for very much. The six principal causes of death among architects, &c., are as follows, the numbers being the proportions of the 778 deaths in this class, the deaths among all males being considered 1,000:—Phthisis, 146; diseases of the nervous system, 92 (probably these would be found to be architects who go in largely for competitions or who have much to do with committees); diseases of the circulatory system (other than valvular disease of the heart, 13, and aneurism, 8), 75; pneumonia, 61; bronchitis, 47; and cancer, 42. From gout, diabetes, aneurism, hernia, diseases of the liver and of the digestive system, Bright's disease and other urinary diseases, and plumbism, architects, &c., die more rapidly than the average. It is comforting to know that the death-rate in the triennial period 1890-1-2 was considerably less than in similar periods about 1871 and 1881.

The mortality from different diseases varies, however, very much in the different periods of life; in the earlier years phthisis is the most prolific cause of death, furnishing more than one-half the number of deaths between the ages of 15 and 20; the real deduction from which is, of course, that if a man (or boy) has phthisis in his constitution it is likely to carry him off at an early age. The proportion which deaths from phthisis bear to the whole of the deaths during the several periods of life, we have calculated as follows:—

From 15 to 20 years of age, 55 per cent.				
" 20 "	25 "	" "	40·6 "	" "
" 25 "	35 "	" "	41 "	" "
" 35 "	45 "	" "	25·5 "	" "
" 45 "	55 "	" "	17 "	" "
" 55 "	65 "	" "	5 "	" "
Above 65 years of age, less than 2 per cent.				

Although the proportion of deaths from this cause continuously decreases according to age, the actual number of the deaths from it increases up to the 25-35 period, but from that point a steady decline, both in

numbers and proportion, takes place. About the same period an increase in other diseases is marked; pneumonia, bronchitis, and diseases of the nervous and circulatory systems appear rapidly to increase; the growth of cancer also is conspicuous. Between the ages of 55 and 65, the following are the principal causes of death:—Diseases of the nervous system, 29; diseases of the heart and circulatory system, 25; bronchitis, 11; urinary diseases, 10; cancer, 9; liver diseases, also 9; while phthisis comes seventh in order with 7. Above the age of 65, nearly the same order holds good, but the deaths are more numerous in proportion to the number living; the increase of bronchitis and urinary diseases during this last period of life is, however, very marked.

Let us now turn to a consideration of the diseases of the artisans more or less directly connected with the building trades. Metal-workers, who are a large class of 700,000 men above the age of 15 years, are exceptionally liable to death from phthisis and other diseases of the respiratory system, due in great measure to the irritating dust and noxious fumes which they must breathe; but under all the twenty-four headings, except alcoholism, rheumatic fever, gout, diabetes, accident, and suicide, their comparative mortality is higher than the average of "all occupied males." Locksmiths, bell-hangers, and gasfitters suffer chiefly from phthisis and diseases of the nervous and urinary systems; but they are a longer-lived class than the metal-workers as a whole, although a little worse than blacksmiths and whitesmiths. None of the metal-workers, however, are in such a parlous state as those who work with lead. Their comparative mortality, between the ages of twenty-five and sixty-five, is no less than 87 per cent. above that of "all occupied males," and of the total deaths at these ages, one-third are from pulmonary diseases and one-eighth from lead poisoning, but the mortality is also excessive from diseases of the urinary, nervous, circulatory, and digestive systems. Fortunately, the class of lead-workers is small, numbering at the last census only 2,072 males above the age of fifteen.

Taken as a whole, the members of the seven building trades (Nos. 60-66 in the previous table) suffer excessively from phthisis, cancer, and gout, among constitutional diseases, and also from diseases of the urinary and nervous systems, but the deaths from alcoholism and diseases of the digestive system are less than the average of occupied males, and, rather strange to say, their mortality from accidents and suicide is also below the average standard. When, however, the different branches of the trade are examined, more practical conclusions can be drawn. Bricklayers, masons, and builders, as might be expected from the nature of their work, suffer somewhat heavily from diseases of the respiratory system. Carpenters and joiners have a low death-rate, and do not suffer from any disease much above the average; cabinet-makers appear to be somewhat intemperate, and also inclined to commit suicide. Plasterers also are given to suicide, and die largely from cancer and diseases of the nervous, respiratory, and urinary systems. Plumbers, painters, and glaziers have a death-rate 18 per cent. above the standard, and suffer severely from lead-poisoning, which probably also accounts for

many of the deaths from diseases of the nervous and urinary systems and from gout; they are also removed rapidly by phthisis, cancer, and rheumatic fever. But perhaps the most unexpected mortality is that among slaters and tilers. At all ages, the deaths among these are higher than the average of the building trades and also than the general average of workers; their general mortality is no less than 39 per cent. above the standard. No less than one death in ten is due to accident, a rate two and a half times the average in the building trades as a whole. Their mortality from intemperance is 23 per cent. above the standard, and that from urinary diseases is double the standard; they also suffer excessively from phthisis, and other lung diseases, cancer, and diseases of the circulatory system. What is more, their mortality was no less in 1891 than in 1871. Brick and tile makers may be considered a healthy class of workmen, but general labourers, who are, of course, among the worst clad and worst fed of men, perish from pulmonary consumption at a rate 37 per cent. in excess of the standard, from other diseases of the respiratory system 52 per cent. in excess, and from circulation diseases 26 per cent.; other diseases and accidents bring their death-rate to 28 per cent. above the standard.

In this hasty survey it has been impossible to do justice to such an important subject, but our words will not have been in vain if they draw the attention of masters and men to the excessive mortality in certain trades, much of which is undoubtedly preventible, and if they lead to further steps being taken to prevent accidents and to minimise, by the good ventilation and sanitation of workshops and by the exercise of all possible precautions, those diseases to which the men engaged in certain occupations are so terribly liable. To readers who wish to pursue the subject further, we can commend Dr. Tatham's report as a model of fulness, clearness, and accuracy. In conclusion it should be pointed out that the figures of the report are based on the deaths occurring in the years 1890-1-2, years in which the influenza epidemic was particularly rife, and this fact must be borne in mind when comparisons are made between these figures, and corresponding statistics for previous periods. Had it not been for this visitation, it is probable that a more general and conspicuous reduction of mortality would have been apparent in comparison with the mortalities of previous periods ten and twenty years before.

In reference to architects we may conclude with one word of general advice: do not overwork, and do not neglect bodily exercise. The less fortunate class of artisans, who are obliged to work at hours fixed by their employers (or, one might more truly say, by the influence of competition and supply and demand), cannot unhappily choose for themselves in these respects; if one of them has a constitution less fitted for the normal strain of the work than the others, he has nevertheless to make the best of it and take the same hours as the others, unless he can turn his hand to some other occupation. But when a professional man has got to that point that he can to some extent choose and command his own hours, he would be wise not to let his enthusiasm or his desire for still further success carry him into more work than his

stitution will stand. There is no doubt at Street, for instance, who was a man of exceptionally strong and healthy physique, led himself prematurely by over-work; he wore out his brain while his body was still young. Within the last two or three years there have been one or two much regretted deaths in the architectural profession in connexion with which it was remarked, 'by those who knew the habits of the deceased persons well, that they might have lived longer had they not confined themselves too close to their offices and neglected active exercise of any kind. On the other hand, one of the most prominent and energetic architects of the day, who has carried out an enormous amount of work, told us that he never took a day to go anywhere when he had time to go to his office. When things come to the point at which there appears to be more money than time to spare, it becomes very easy to fall into the habit of spending all the waking hours either seated in a room or being driven about. And with that habit comes decay of physical strength, and premature old age.

NOTES.

SIR JOHN LUBBOCK published this week an important letter on some of the issues at the County Council Election. He pointed out that at the policy of the Council in erecting workmen's dwellings was calculated to destroy private enterprise. The Council has spent 500,000*l.*, but have only housed 6,000 persons. From this it would appear that private enterprise has yet a good field before it. Those who really suffer are the ratepayers of London, who have to pay taxes to make up the loss on the municipal dwellings. Mr. John also drew attention to the losses sustained by the Council doing their own work and to the excessive cost of the parks. The truth is that the Council is very much made up of amateurs engaged in business, and the great requisite of the moment is some check on financial waste. We doubt it is possible that the Finance Committee can ever be a sufficient check: it is only a subordinate committee; but that some means should exist is certainly desirable. The difficulty is to find those means: the electors can do no more than return candidates pledged to economy.

RAILWAY companies are often between two (or more) stools in consequence of disputes as to liability for carriage. A disagreement or misunderstanding between sender and consignee sometimes places them in a very awkward position, both parties assuming each a determined attitude that a deadlock ensues. Then, although on the best of terms with each, the company is compelled to invoke the aid of the law to obtain the amount undeniably due to it, but which either party will pay. In a case of this nature tried before Mr. Justice Ridley last week an interesting point to builders and builders' merchants was raised. The circumstances were rather unusual, inasmuch as three parties were concerned in the transaction, without counting the owners at all. The claim was for the carriage of a quantity of bricks, which were consigned to A, transferred to the order of B, and by the instructions of the latter delivered to C. The railway company obtained judgment against the original con-

signee A, the bricks having been consigned "carriage forward;" but the judge directed that B should indemnify them, without prejudice to any rights they may have against C. Thus, the railway company get their money, while the question of actual liability as between the merchant and the builder is not affected. Of course the company might have simplified matters by insisting on the payment of carriage on delivery; but, fortunately, although they always reserve the right to do so, they seldom hamper business in this way if it can be avoided.

The design by M. Laloux for the new "Gare d'Orléans" on the Quai d'Orsay at Paris is published in *La Construction Moderne* for January 29, in the shape of two small-scale line elevations, without a plan. As far as one can judge from these, the design will have a certain force and character appropriate to a railway station. The successive openings on the ground floor, in the flank elevation, are covered by a series of very deep rusticated arcading, springing from rusticated piers. This portion of the design is "stopped" near each end by a pavilion with broken pediment, a *fronton*, and a high Mansard roof, the whole of this portion being in what we may call the usual French style. The whole building will hardly commend itself to English taste, but it will not be commonplace.

We read that in the course of pulling down some premises in Mitre-street the labourers found an old arch and spandrel which had been utilised as a support, and is conjectured to be a relic of Queen Mathilda's Priory of Holy Trinity, or Christchurch, once famous for its large and beautiful church, and the great wealth of its possessions. The Priory and precincts were brought in marriage to Thomas Howard, fourth Duke of Norfolk, by Margaret, sole daughter and heir of Thomas Audley, Lord Chancellor, and Lord Audley of Walden, to whom they had been given by Henry VIII. The Duke's son, the Earl of Suffolk, sold the Priory and Audley's mansion-house to the City of London; and in 1650 Oliver Cromwell gave the Jews license to settle there. The church of St. James, erected in Duke's-place (where Holbein lived) within the precincts in 1622-3, and rebuilt in 1727, was demolished about twenty-five years ago. A gateway of Holy Trinity was reproduced by Mr. George H. Birch, F.S.A., for his "Old London" street in the Inventions Exhibition at South Kensington, 1885; there are also views by N. Smith, January, 1793, J. Sewell, September, 1802, and R. B. Schnebbelie, 1825. That gateway, pulled down in September, 1816, had formed the principal entrance from the west—it was latterly known as the Thrum, or Mop Gate, from, it seems, the hiring of servants thereat.

A BLOCK of chambers has been erected at the north-east corner of Ormond-yard, York-street, after the designs of Mr. W. M. Bruton, of Trafalgar House, Green-street, W.C.* The yard formerly appertained to the house, in St. James's-square, of James, second Duke

* Messrs. Courtney & Fairbairn, of Albany-road, Cambridge-contraction.

of Ormonde, who, having suffered attainder in 1715, retired to Avignon. He died November 16, 1745, and was buried in the family vault beneath Henry VII.'s Chapel, Westminster Abbey. A part of his house remains in the premises, No. 9 (entered from York-street), which were altered and repaired in the summer of 1890 for the Portland Club, upon their removal from Stratford-place, Oxford-street. The Duke of Ormonde's house was sold by the Crown for 7,500*l.*, and was valued at 300*l.* a year. In his "Tour through the Island of Great Britain," second edition, 1738, De Foe mentions "the house that once belonged to the Duke of Ormonde, since to the Duke of Chandos." It must have been of considerable extent, for he goes on to say that some four or five noble and good houses, together with stables and coach-houses in the rear, were built on its site. The original house seems to be one of those, thirteen or fourteen in number, for the erection of which on the north side of the square, on land owned by the Earl of St. Albans, a warrant was issued to Baptist May and Abraham Cowley, dated September 23, 1664. The houses were at first called "The Piazza"; May's names appear to survive, in a corrupted form, in the adjacent Babmaes-mews.

THE search for a process by which amorphous carbon can be converted into the crystalline form found in Nature as the diamond, has largely added to our knowledge of the reactions of carbon at very high temperatures with other bodies. Moissan especially, with his innumerable experiments with carbon mixtures in the electric furnace, has rendered great service to the scientific world, although he only appears to have succeeded in producing diamonds of a size too minute to be of any commercial value. Dr. Kohn has recently published some interesting facts concerning carborundum, which was discovered by Acheson in an attempt to obtain crystalline carbon, and although Mr. Acheson did not succeed in upsetting the diamond market, he appears to have discovered a very useful compound. Carborundum is a carbide of silicon, and is made by heating in an electric furnace a mixture of coke, sand, sawdust, and salt. The carborundum is taken from the furnace in the form of a mass of beautiful crystals. It is then ground, washed with dilute acid, and sorted into different degrees of fineness. The commercial value of carborundum depends upon its hardness, which is stated to be between that of the sapphire and the diamond. It is, in fact, sufficiently hard to be capable of polishing the diamond itself. It is manufactured in America by means of electrical energy, obtained by utilisation of the Falls of Niagara, and is sold as a powder and in the form of wheels varying in size from 36 in. downwards. Its chief competitor is emery, but it is claimed that although dearer than emery, carborundum can do twice the amount of work of emery, with a saving of 25 per cent. of the labour. In price, carborundum has dropped from 40*s.* per lb. in March, 1892, to 7*½d.* in October, 1897.

THE sliding scale system of charging for electric supply is beginning now to be adopted in London. Since the beginning of the month the Vestry of St. Pancras have given their

A Question of Railway Carriage.

Ormond-yard, St. James's.

Systems of Charging for Electric Supply.

consumers the option of being charged at a fixed rate of 6d. per unit supplied, or of 6d. per unit for the first three hours they take their maximum current per diem and 3d. per unit afterwards, the maximum current during the quarter being measured by means of Wright's maximum demand indicator. It seems to us that the Vestry have done foolishly in adopting such a ridiculous sliding scale. Charging their consumers at a fixed price per unit consumed is unjust, but at least the usage is sanctioned by custom. If the Vestry wished to charge equitably, they ought not to have charged the unprofitable class who consume for less than an hour per diem their maximum current at the same rate as those who take it for three hours a day. Very few consumers take current daily equal on an average to their maximum current for three hours. The deserving person whose careful management enables him to get a discount will find that it barely covers the shilling quarterly rent of the tell-tale thermometer. The true system of charging for the electric light was clearly stated by Dr. John Hopkinson six years ago, and it is a pity that it is not adopted in its entirety by every electric supply company. Perhaps the nearest approach to an equitable tariff is that introduced by Mr. Arthur Wright at Brighton, namely, 7d. per unit for the first hour, and 1½d. per unit afterwards. Even on this scale, as Mr. Wright has pointed out, the constant user has to pay a share of the cost of supplying those who use their light irregularly.

THE figures given in the paper on electrical cooking and heating, read by Mr. Adams to the Northern Society of Electrical Engineers, are interesting and instructive. Most householders will be surprised to learn that if they intend to do all their cooking electrically they will consume on an average three times as much current as they do for lighting. At the present prices charged by the public companies this is almost prohibitive. We agree with Mr. Adams in thinking that it would be profitable for some of the supply companies to encourage cooking by electricity by charging a low price, say, a penny per unit in summer, for current consumed for this purpose. In country houses which supply their own electricity, especially when the motive power is water, electrical cooking has proved deservedly popular. Its greatest drawback is the expense of heating water, but in large houses or flats a slow combustion stove could be used to supply the hot water, and when this is done electricity for cooking at 2d. per unit would be profitable to both the companies and their clients. On the other hand, electric heating by radiators will never become popular until the price of electricity becomes very much less. A unit per hour, roughly, is needed to heat every 2,000 cubic ft., and the supply companies are not likely to reduce the price of electricity for heating, as the heating load overlaps the lighting load and is heaviest in the winter time. The City of London is an ideal place for electric heating, but so long as the company charges the exorbitant price of 8d. per unit, there will only be a small demand for this purpose. Where power can be had cheaply, electric radiators for heating are in request. In ship-heating, for example, they are replacing the older and more troublesome method of heating by steam pipes.

South African
Society of
Architects.

THE "Proceedings of the South African Society of Architects and Engineers," Vol. III., come out rather late, as they include meetings between the dates of October 30, 1895 and June 30, 1897; but the volume contains a good many interesting papers. Among the subjects treated of are "History and Civilisation as evidenced in Art and Architecture," by Mr. Arthur H. Reid; "American Timber," by the same author; "The Manufacture of Transvaal Cement," by Mr. H. D. Griffiths; and "A Rational Sewerage System," by Mr. Theodore Reunert. A short and suggestive paper by Mr. H. D. Griffiths, on "The Decimal Division of the Circle," which touches on a subject of world-wide importance, we reprint in another column. The headquarters of the Society is Johannesburg. We may congratulate them on a volume which, though, as observed, it is rather long in coming out, contains so much interesting matter, and which promises so well for the future of the Society.

THE exhibition of Mr. J. Macwhirter's "Scenes in Scotland, the Mediterranean, and America," at the Fine Art Society's Gallery, is noteworthy not only as being a fine collection of fresh and broadly treated open-air studies, but also as showing a greater variety than we had expected to find among the studies of a landscape painter who in his larger works has been rather restricted in his choice and treatment of subjects. Among many admirable sketches we may draw attention especially to "Looking to Italy from Taormina" (5) in which the sheeny look of the bright blue sea is beautifully conveyed in a somewhat slightly executed sketch; "Cemetery of Eyoub, Constantinople" (6), "Loch Achray" (9), "Glen Aric" (10), remarkable for its fine colour; "The Coolin Hills, Skye" (11), "Evening, Kinrara" (25), and "The Tay from Perth Bridge" (70). "The Site of the Ancient Port of Corinth" (69) is interesting in a topographical and archaeological sense. There are also some charming studies of flowers for foregrounds, "Anemone and Gentian" (79) in particular. Why does the artist add the word "Night" to the little sketch of "Richmond, Yorkshire" (34)? It certainly does not convey the impression of night.

Elections at
the Royal
Academy.

At a meeting of Academicians and Associates of the Royal Academy on Wednesday last, Mr. B. W. Leader and Mr. J. Seymour Lucas were elected Academicians, and C. Napier Hemy an Associate. Of the election of Mr. Seymour Lucas artistic opinion will generally approve. As to the election of Mr. Leader there is likely to be more difference of opinion. He is undoubtedly one of our most "popular" landscape painters, but he is not one whose works can be regarded as calculated to uphold the status of English landscape art in the eyes of the foreign critic or of the best informed persons in England. And when we consider, along with this honour paid to him, that so truly artistic a painter as Mr. Napier Hemy has only just arrived at the honour of being an Associate, one can only conclude that in regard to landscape the

Academy is still pervaded by the same spirit which induced them to sky Alfred Hunt's pictures and refuse him the compliment of election.

THE ITALIAN RENAISSANCE.*

BY PROFESSOR ATTCHISON, R.A.

THE object of lectures on architectural subjects is not merely to enlighten you on the subject of which they treat, but to show how lessons may be learned which may improve and advance the art. I do not know a more useful example to give than the works of Machiavelli. He not only studied deeply and read widely the history of the past, and acutely observed the affairs of his own day, but his object was not to teach history in the ordinary sense, but to extract from the histories he had read and from the affairs in which he had been engaged those principles which had been followed by successful nations and by successful individuals. He saw what nations had done and what people did, and was not misled by what they ought to have done.

Now, this is the way in which we must study past architecture. It is not for the purpose of using it again, but to find out what were the underlying principles which made these past epochs not only delightful to their contemporaries, but also what has given them those qualities which make them delightful to us. You must remember that all the successful architects have given their contemporaries something novel which charmed them; if the novelty was an advance posterity has been charmed too, but if it was a step backward or away it is either laughed at or execrated by posterity. I shall hereafter say something about the causes which brought about the Renaissance in Italy, but at present I mean to confine myself to the lessons we can learn from the works of their great masters. It is not now necessary to consider how these tastes arose, but it is undoubtedly the case that there was a general desire pervading society to have something more simple and more elegant than existed in their Gothic structures, for their christened Gothic "the tasteless style."

We, as architects, look with architectural eyes on all structures; we ask that the outside should reveal to us their internal uses, and that they should be stamped with the character that their use demands: that the inside shall not only be perfectly fitted to their use, but be becomingly and architecturally fitted. That there shall be a reasonable proportion between the masses and the weights that they bear, and that the whole should not only be sightly and agreeable, where sightliness is proper, but that the whole should bear the stamp of intelligent and properly economical construction made to take the form that is becoming to its use. The proper concentration of light and the treatment of enormous windows has not yet been solved architecturally in the Renaissance. Nature, if I may so say, is obliged to make all her living organisms capable of living properly, but she benevolently makes a large part of them agreeable or delightful to man's eye, and gives them all, ugly or beautiful, characteristic shapes. However much vastness and mass may momentarily affect us, we are rather disgusted than pleased when we find that this vastness and this massiveness is disproportionate to the uses for which they were employed.

It seems to me that neither the architects nor the Italian public were in the least affected by these metaphysical considerations. If the whole structure that presented itself to view was dignified, impressive, or delightful, the Italian public never asked themselves if these qualities were obtained by a lavish and extravagant waste of material; and, too, it must be recollected that in the days of the Renaissance there was almost a horror of anything that brought to mind the asceticism and hindrances to free thought of precedent times. Besides this, classical peculiarities were new and delightful in their eyes, and they sought to overlay the Christian civilisation of the immediate past with pagan beauty and pagan symbolism. The staff of the augur, the knife of the sacrificer, the altar on which the victim was sacrificed, the skulls of the victims, were chosen as ornaments, although their symbolism had really nothing to do with the civilisation

* Being the first Royal Academy lecture on Architecture, this Session. Delivered on Monday afternoon, January 31.

the day; but as every one was more or less steeped in classical lore, it showed that the architects were under the same influence; and there was, too, at that time a strong desire to blend Christian and Pagan symbolism into one whole. This desire is now extinct, and we merely tolerate Pagan symbolism unless it is shrouded in peculiarly attractive or beautiful forms.

Nearly the whole of the Early Renaissance architects were goldsmiths, sculptors, and painters, and consequently votaries of the beautiful; they certainly strove to improve on the Roman ideas of beauty, and at the same time they acquired a taste for elegant proportions, and for a certain simplicity which was removed from Gothic ideas. What we have to learn is how this sense of proportion, this simplicity and breadth, this spiciness of effect may be applied to different forms and different proportions. To ask of one thing alone, the climate of England is very different from that of Italy; rarely have hot weather or superabundant light; in fact, so far as light is concerned, we rarely get sufficient in town buildings when the whole of the front and back walls are of glass. The exclusion of light and heat and ample supply of air are necessities in a very grim climate with a blinding sunshine, so that even our buildings are not for military purposes, the plain spaces, which give such unity to buildings in a warm climate are difficult of attainment, for we live in a country where every gleam of sunshine is valuable. We have, therefore, to cultivate this sense of elegant proportion, and to apply it to the new conditions that arise in our own country.

We, as architects, should not forget that we live to express our own views of architecture; we have to raise the emotions that should be raised by the uses of our buildings by different means and by a different treatment from that which was adopted by the Pagans of ancient times or their Renaissance successors; but we must not clothe our works with a similar dignity, purity, or expressiveness, so that future generations may look with the same admiration on our works that the works of the Romans or their Renaissance successors have excited in us; no light task, but one that every architect should before himself and try to accomplish. We note, if we would, turn the minds of the present generation from scientific investigation, and from the application of the laws of nature to man's use; but there does not seem any reason why the delight in beauty for its own sake should not co-exist with the desire for penetrating into nature's secrets, or applying them to our use. The discoveries of the laws of nature have an irresistible attraction for certain minds, and their application to man's interests is followed by power and wealth, which are irresistible attractions for most minds; while the rendering ourselves capable of enjoying every beauty of nature and art not only enriches itself in the individual, but has no other object than that of raising, improving, and filling him with delight. It is, perhaps, natural that the bulk of mankind should pursue that which leads to power and wealth; but, at the same time, it should not prevent those who are gifted with higher aspirations and more delicate sensibilities from doing the best they can to perfect those faculties in themselves which they can appreciate and enjoy beauty and loveliness. I am afraid it is not common for people to perfect themselves to any high degree those arts to which the bulk of mankind are devoted, and from which they can expect little return, little admiration, and, perhaps, no monetary reward; but still we do find that some of the fine arts, the mere practice of which brings its own reward. This, I think, is peculiarly the case with music, but I do not know why it should not exist in all the fine arts. Milton caught a glimpse of the really beautiful and admirable soul when he speaks of fame as "Spur that the clear spirit doth raise," and it is very properly "that last infirmity of noble mind." To appreciate and still more to create things of beauty, should be a desire and an end in itself, and until this is so we can hardly expect to raise ourselves to the heights that have been attained by the great minds of the past.

There are a few people one has read of who do not calmly pursue that simple desire to do their duty, to help and raise their fellows, and to perfect all their own capabilities, without any hope of reward, except the satisfaction of feeling that they are acting rightly. Such a one may say I make "my life a perfumed

altar flame;" it is this spirit that must be cultivated if we are ever to attain to the excellence we all desire to possess. Even now almost every architect may be sure that if he constructs an excellent building that proclaims its purpose, that his exertions will not be wholly thrown away. There are sure to be some people whose souls are attuned to admire the beautiful and the perfect, who will thank, mentally at least, the creator of this joy for themselves. In the turn of fortune's wheel there is no doubt that loveliness, beauty, and terror will in some future time again have the ascendancy over man. I say this because it is evident to me that Nature has provided these things for man's solace and delight. We cannot suppose that all these forms and colours of beauty which she particularly spreads before our eyes at sunrise and sunset, and the blackness of storms, the lightning and thunder, are not secondarily created for the advantage of man; the bulk of everything Nature makes is beautiful, and it is not to be supposed that at some future day man will not desire to make every work of his hand as lovely, as beautiful, or as impressive as the works of Nature.

I cannot forego the desire for real architecture, for any other gift, *i.e.*, the making of a well-ordered organism after the fashion of Nature's; but if our aim were like that of the Renaissance architects, to make something dignified, impressive, or beautiful in architectural language, without regard to its other architectural qualities, we should have to abandon our present procedure and revert to that of the Renaissance, *i.e.*, to learn to be handy with our fingers as goldsmiths, which involves a deeper knowledge of form than most possess, as well as an advance in draughtsmanship and modelling. In Renaissance days those who felt that they could rise higher, perfected their early studies by a more complete study of painting, modelling, and composition, and became distinguished painters, modellers, and architects.

We cannot be sure that we have the vigour of mind and body which distinguished these Renaissance artists, still we can employ all the talent and vigour we have in this direction, but if we are to be architects, we must add to it that knowledge of the use of materials that is called construction.

I do not know of a more startling instance of the vigour and versatility of mind of these Florentine craftsmen than the story of Giuliano da San Gallo. He and his brother Antonio, in their returns for taxation, described themselves as carpenters; but then, as in Scripture times, a carpenter was a wood carver as well. Giuliano was carving some of the stalls of the Cathedral of Florence, when the Duke of Calabria made war on Lorenzo de' Medici, and Lorenzo wanted a military engineer to fortify Castellana, and whom should he pick out but Giuliano, and told him to pick up his tools and go and fortify the town. Giuliano, being conscious of the want of skill and timidity of the gunners, took them in hand, and so well did he train them that the Duke raised the siege. You all recollect that the Pope made Benvenuto Cellini his master gunner when he was besieged in the Castle of St. Angelo after the sack of Rome.

Almost every one of the great Italian artists of the Renaissance was a craftsman, so I am by no means sure that we have much to thank Sir W. Tite for, when he put a stop to architects being craftsmen, and I think we shall have to go back to craftsmanship. Certainly, if architecture is ever to go on again as a progressive art we must before all things be constructors, for how can a man who is not a constructor advance a constructive art? I think there is no doubt that the early architecture of the Renaissance was the most beautiful architecture the world has seen since Athenian days. You have only to look round an architectural exhibition to see it, only these men were not constructors. My business at present is to show you what made it so beautiful.

Almost all the artists of the Renaissance were either sculptors or painters, and their constant study of the human figure gave them particular insight into the beauty of form, and more or less into how it was attained, and their study of Roman work also gave them an insight into how the Romans attained it; while even the very fact of their being painters or sculptors showed that they were men blessed with invention. They had, when they worked as architects, the guidance of the sizes and shapes of their buildings and the door and window openings. There were still remaining in Rome, the ruins, at least, of many buildings

that have perished since. They, therefore, had little else to do than to perfect the form of what was ready made to their hands, and after the first few years they had the methods of proportioning the Romans used, that they learned from Vitruvius. They had, too, a beautiful climate with much sunshine, so that they were almost as well able to play with light and shade as the Greeks themselves.

Perhaps, of all the buildings left us, the east end of Sta. Maria delle Grazie, at Milan, is the most perfect; the variety of shapes, the elegance of the proportions, the breadth of effect and the beauty of the forms used are, perhaps, more conspicuous here than in any other of the exquisite buildings that have been left. The large plain surfaces were only broken up enough to make them interesting, and at certain times the wide shadows cast by the projecting eaves gave the exact proportion of light and shadow that made the building both effective and charming. The polygonal shape of the peristyle that surrounds the dome is admirably contrasted with the horizontal lines of the end of the choir, the small tower above it, and the side projections; while the curved eaves of the apses admirably contrast with the vertical and horizontal lines. This was by Bramante, the great architect of the Renaissance.

Perhaps, next to that, the Scuola di San Marco at Venice is the most lovely building of the early Renaissance, and I am now speaking of the front to the Piazza. All important buildings in a city impress themselves on the memory of the inhabitants, and more especially on that of the architects, so it is not surprising that the half-round gables of St. Mark's were repeated here. The variety of its skyline prevents any look of stiffness about it, and although it is cut into two nearly equal parts by the entablature of the ground and first floors, all the vertical divisions are most gracefully graduated, blank wall-spaces are left on the first floor to repose the eye from the elaboration of the door and window dressings and of the lower frieze and pilasters, and the whole treatment is delicately varied in colour. On the ground floor the grand doorway is one of the most perfectly proportioned and elegantly adorned features that exist; the ornamented parts of the building are admirable in various ways, and contrast delightfully with their surroundings. It would be absurd to attempt to give any of its proportions that might be of use again, as the whole composition is so strongly marked as the outcome of the skilled master of delicate sensibilities, who was full of invention. The semicircular head of the main doorway is repeated on a larger scale in the crowning head of its canopy, borne on two columns with carved drums, pedestals, and capitals, supporting a projecting entablature above; and, lest the edge of the half-round canopy should cut too sharply against the plain background, it is fringed with open-work scrolls running up to the pedestal of Madonna and Child that make a final to the canopy. The attic has a semicircular gable which again repeats this feature. This work, like all the early Renaissance work, is strongly marked by a profusion of ornament, and has by no means the artistic simplicity of the Greeks, but at the same time it has an ineffable charm of its own. This canopy stands out in front on a large blank space, flanked by two pilasters, the space itself below its crowning entablature being panelled with white panels with coloured marble frames, and on the attic above the entablature is a large projecting shelf bearing the winged lion of St. Mark, with four bells below the shelf. The spaces between the pilasters on the ground floor on either side of the grand doorway are filled in with vaulted chambers in perspective, each chamber containing a lion. Further to the right are two open loggias in perspective, with coffered ceilings, on either side of the smaller doorway, and each of the loggias contains figures. These architectural perspectives have been found great fault with, although they met the taste and fashion of the time, and so have the gates of Ghiberti, but I am inclined to look with contempt on *a priori* criticisms of beautiful things that have captivated mankind. Such buildings as these can neither be copied nor paraphrased by any but those blessed with equal genius, equal sensibility, and of equal cultivation.

Although Venice is full of these elegant and original conceptions, I think there is nothing that can quite equal the Scuola di San Marco in that happy lightness and variety of invention,

except that mural monument to Orsini and Zen whose principal form is a circular medallion, where a shelf below its centre supports a carved sarcophagus which bears on its top a kneeling figure of a woman with a child beside her, whose heads and busts break the formal line of the circle. Below this is another shelf supported on a form like half a shield, with scrolled brackets at the ends; this shelf bears a winged figure at each end, supporting a shield, while the middle is joined to the circle by a double-headed eagle, from the bottom of this support is hung an inscribed medallion. The stiff form of this medallion is well contrasted by floating ribbons and bunches of flowers.

The early Renaissance buildings of Venice run to this sort of delicately irregular invention apparently from the contagion of dazzling sunlight and the rippling shadows of the water, from there scarcely being an upright line in any building, and from Venice being a city of pictured and marble walls, which the sun, the frost, and the sea-breeze have softened to the colour of an iridescent shell, while the atmosphere itself turns everything into mother of pearl.

At Brescia there is a portico to the church of Madonna dei Miracoli, which, although very rich and much carved, with, it is said, lapis lazuli backgrounds to the carving, is a trifle stiff, and the columns, though of considerable size, are comparatively small to the large superstructure over them. The architect, who is said to have been Beretta, had a happy idea by which he gave a certain freedom to the portico, and at the same time greatly increased the scale of the columns. At the bottom of these columns is a carved drum and the columns and bases stand on a continuous pedestal; through the centre of this pedestal and between the two middle columns is the main entrance into the church. By carrying through the capping of the carved drums as a lintel, the architect has added scale and dignity to the columns, and by a little bit of open scroll work over it he has given to this feature a playful air.

Other specimens of the delightful Early Renaissance are to be found in the Church of Santa Maria dei Miracoli and the Cornaro-Spinelli Palace at Venice. Unless you are imbued with the feelings of admiration for delicate work, native beauty and refinement made by a people entranced with colour but not insensible to form, you miss the charm of the Early Renaissance in Venice, and more appreciate the delicate but more restrained beauties of the early Florentines, who were not colourists.

I now show you the Spinelli Palace, and the outside and inside of Santa Maria dei Miracoli, as I saw them in 1854. The inside had then all the historic additions of the ages it had passed through, these are now removed and the walls have been scraped, polished, and the ceiling repainted. The restorers have tried to bring back its appearance when first completed, but they could not be animated with the glow of those to whom the discovery of how to produce beauty was almost a divine revelation, even if the moderns had possessed the ancient skill.

SIR W. RICHMOND'S LECTURES.

SIR W. RICHMOND'S delightful lecture on Painting, at the Royal Academy on Thursday last week, dealt with the subjects of Form and Colour, and was a remarkable lecture for its union of literary excellence and practical suggestion. In commencing his remarks he dwelt on the increasing importance now attached to the craftsmanship element in art, and hinted that this would probably in the near future receive more attention from the Academy.* It was in accordance with this increased importance attached to the constructive side of art that he would urge them to base their studies of painting on the drawing of the skeleton, as the foundation of all figure painting. The influence of impressionism was rendering the art-students careless as to accurate study of this kind, and the drawings of the skeleton now sent in by students were inferior in general to those which were

executed by the students of his own time. To draw the figure they must know the skeleton accurately, and should be able to draw all the joints from several points of view, from memory. All drawing was an act of memory, and the power of memory could be strengthened by practice and cultivation. The artist ought to have the knowledge of the construction of the body at his fingers' ends. Lectures on anatomy were only of use if put into practical application; and the study of anatomy had to be kept up throughout life, and not merely during student days. Sir W. Richmond then proceeded to describe his own method (which he has before described in a paper read at an Art Congress—we forget where at this moment) of forming a skeleton of copper wire, with cork for the pelvis, and laying on the principal muscles in wax; one of the best methods possible for impressing the whole system of muscle attachment on the memory. In connexion with this he would refer them to the small wax models made by Michelangelo for the study of figures for his pictures, some of which were to be seen in the South Kensington Museum. The Greeks, it must be admitted, did not study anatomy scientifically, but they were very keen observers, and they had the nude figure in life and action constantly before them.

Turning to the subject of drawing, the lecturer mentioned four methods: silver-point, pencil, charcoal, and crayon. Silver-point was an admirable medium for delicate drawing of the figure or portions of it, for such things as studies of heads, hands, and feet, and it had the advantage that its lines were indelible, but on this very account it required very careful handling, and in the nature of its effect also it was only suitable for delicate and carefully-considered work; no "scribbling" was allowable with it. Pencil had a much wider range, but the effect should all be got with one pencil; two pencils of different quality should not be employed on the same drawing. Charcoal, on smooth paper, was a splendid material for studies, and was in fact more like painting than drawing. Crayon on tinted paper was excellent for such things as drapery studies; the ground of the paper should form the half-lights, the lights and shadows being put in with white and black crayon.

Every design for a figure or a group of figures must express action, and it might be observed that slight and refined gesture was more difficult to express adequately than violent action. Students should never go anywhere without a pencil and sketch-book, prepared to make a study on the spot of whatever presented itself for study. On the other hand he would never advise them to design a figure with the model present, but to refer to the model afterwards to correct the design. In the process of inventing a picture, spaces and planes had first to be considered. The right proportion and shape of the canvas was a point of considerable importance; many pictures were injured in effect by the bad proportions of the canvas. The first lines in a composition were to be respected, and not rashly obliterated, when they had been the result of careful consideration. On these first lines the success or failure of a picture was mainly built. The first rough idea for a picture, however, might often be susceptible of greatly improved development, little by little, just as, to compare painting with music, many of Beethoven's finest themes were hammered out by degrees from a comparatively crude initial idea. But the alterations should be done on a tracing, so as to preserve the opportunity of comparison with the first idea before sacrificing it. No model for a separate figure should come on the scene till the whole composition was matured in its grouping, perspective, and planes. He had found it very useful to make little dummy figures in wax, and arrange them on a small imaginary ground plan of the scene, so as to study their grouping and the arrangement of planes. It was a good thing also to roughly model the architecture and surroundings of the scene; and project the shadow of this on the canvas with a lantern. Then came in nature in the shape of the model, from which not only the general figure, but each head, hand, and foot should be separately studied. The studies for the drapery came last of all.

In studying the colour scheme for a picture, make the study on a small scale, but quite decided as to colour.* The ground for the actual picture should be as white as possible,

as it was the tendency of pigments to become more or less transparent with the lapse of time, so that a dull ground would in time make its effect felt on the picture. The picture should be sketched in first with weak size and powder colour—distemper, in fact. It was well then to put it by for a few days, to recreate the mind by looking at other pictures, but only pictures of the same kind or class as that which you were intending yourself to paint. The distemper picture having been fixed with some such material as Bell's mastic varnish, and left to dry for a day or two, was then ready to be proceeded with as an oil picture. Mix some flake white and rub it thinly over the extent of canvas to be first painted on. The object painted should always be kept before one while painting. Embroideries and other such delicate details should always be drawn with great care; clumsy or careless handling of such things would not do. For very bright colour paint into wet white with transparent colour. For the bright portions they should not be afraid of cool colour. The Venetian artists habitually painted the lights with cool and shadows with warm colour. Colour in shadows was generally warm. After the colouring was finished, let the picture dry for glazing with semi-transparent colour, with which the most beautiful effects might be produced.

In regard to drawings and sketches, Sir W. Richmond drew attention to examples of various methods of drawing which were hung on the walls; a set by Botticelli for the "Divina Commedia," a remarkably refined drawing by Ingres, various examples by the late Mr. G. Richmond, R.A., and also bestowed especial praise on some of Cockerell's sketches of ancient architecture which were exhibited; slight in execution, but representing clearly what they were meant to represent; not like some of the modern sketches, which might be hung either way up. In conclusion, he exhorted the students to endeavour to see the best in everything. *Nil admirari* was the motto only for those critics who had nothing to say. Referring to the fact that the Gold Medal had not been awarded this year, he hoped they should see better work from the students two years hence, and that they would be inspired to higher efforts by the glorious exhibition of Millais' work in the adjoining galleries. Recapitulating the general drift of his lecture, he reminded them again of the importance of the "Arts and Crafts" element in art. A wooden spoon, treated in a truly artistic spirit, might be a better expression of art than an oil-painting. The students' work, moreover, had become too tentative recently, too like the work of amateurs. They must learn to work on a definite system.

NOTES ON THE DECIMAL DIVISION OF THE CIRCLE.*

THE metric or decimal system of mensuration, which has been in use among several of the European nations for nearly a century, and which is gradually but surely forging its way in all British scientific bodies and schools, possesses admitted and enormous advantages from a scientific as well as a practical point of view, over our present system of mensuration.

These advantages are familiar to most of us, although through an innate sense of conservatism we hesitate to profit by them, and prefer to restrict ourselves to the traditions of older times, and it is not my purpose to advocate the universal use of the decimal system, that task having years ago been ably undertaken by our leading scientists.

Most of us feel compelled in many circumstances to resort to the decimal system, and there cannot be the slightest doubt that, in the course of time, our methods of measurement will become obsolete, and will be replaced by methods more scientific, more simple, and more expeditious.

Examples—Areas, cubes, cubic contents in gallons, circumference, AD; area of circle 7854 D; no relation between standards of length and capacity and weight.

Although the decimal system is in itself perfect, yet it is strange to find that, in countries where it is adopted, an anomaly exists as far as regards the relation between the divisions of the circumference of a circle and those of time.

* A paper read before the South African Association of Architects and Engineers, by Mr. H. D. Griffiths, Vice-President.

* It is perhaps unnecessary to remind our readers that we have repeatedly urged that an "Academy of Arts" ought to be concerned to develop and encourage every form of art, and that "art" does not mean "painting." That this view has not been acted upon by the Royal Academy is not the fault of Lord Leighton or Sir W. Richmond; but it is to be feared that a good many of the painters who form the majority in the Royal Academy are more narrow in their sympathies.—Ed.

* Some of Lord Leighton's miniature colour studies for large paintings are admirable examples of this.—Ed.

This anomaly, which has so long escaped attention, occurs in our system of division of the circle into twenty-four hours, and of the hour into sixty minutes, and it has recently been pointed out by M. Henri de Sarrauton, a French engineer of great ability, who has published an elaborate paper on the subject.

Such a division involves the use of three different scales of calculation, with incomplete common ratios, since the seconds are generally divided into fifths, tenths, and hundredths, and the aliquot divisions of time thus comprise the duodecimals, sexagesimal and decimal divisions.

Our system of dividing the circumference of a circle into 360 parts is equally anomalous and inconvenient.

It is true that a division of circumference of circle into 400 parts or grades is adopted in certain mathematical computations, and that it lends itself to the application of the centesimal system, but this alternative system has little in common with our admitted division of time, that it cannot be used in astronomy or navigation. The corresponding divisions of the circle and of time have a constant ratio of 10 to 15, a ratio which is not a decimal one, and therefore is not convenient for the purposes of calculation.

In order to simplify matters, M. de Sarrauton proposes to reduce the divisions of the hour to the decimal system, that is, to divide the hour into 100 minutes, and the minutes into 100 seconds. The length of the day is determined by the time of revolution of the earth round its axis, that is to say, by the time consumed by any point of the globe in describing a complete circle, so as to come back to its original position as regards the sun.

Retaining, therefore, the division of the day into twenty-four hours, the correlation between circular and time measurements would be most clearly defined by dividing the circle into 240 degrees, the degree and hour into 100 common minutes, and the minute, both of time and angular measure, into 100 seconds.

This, in itself, would not only introduce greater simplicity and more speed into these complex calculations, but it would immeasurably diminish the liability to error incurred by the use of a number of different systems.

The relation between time and angular measures being thus established, we have a system capable of being readily put into practical use in astronomical and nautical calculations.

The equator being divided into 240 decimal degrees, the sun would therefore traverse 10 degrees in one hour, instead of 15 degrees, as in the present system.

Having a globe representing the earth divided thus, let us, for instance, select a point, say, 27 degrees, 4,230 east of the meridian. The sun travelling apparently over 10 degrees during the hour, we see at once that when the sun is passing the meridian at twelve o'clock, the time at that particular point is 2 o'clock, 4 minutes and 23 seconds decimal.

Therefore, a chronometer which has been regulated with the fixed meridian will indicate at a glance the longitude of any spot where a ship may be when the sextant indicates that the sun is at its highest point.

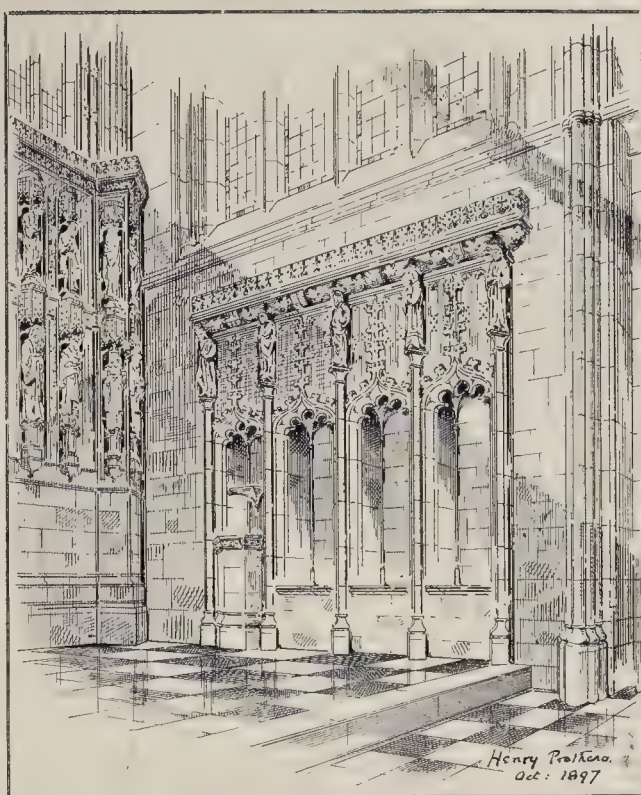
A watch divided according to this system possesses, among others, the following advantages:—

That it enables one to read the hours according to the present system in use; that, in ordinary observations, it gives a greater degree of accuracy than the present system of 60 seconds in the ratio of 100 to 36; that it gives once decimal numbers amenable to immediate calculations by ordinary rules or by ordinary logarithms; that it gives a constant correlation between time and angles, and that it is capable of giving the exact longitude of any place.

The adoption of this system of angular division would necessitate a complete reversal of our present acknowledged methods of angular logarithms, but would in no way interfere with our trigonometrical system. For practical purposes, in addition to simplicity, it is easy to see that we should still have some fixed relations for sines, cosines, &c., as in the present system. It simplifies also the reading of verniers on scientific and surveying instruments.

The first steps towards the adoption of the decimal division of the clock has already been adopted in certain parts of Italy and India, where the quadrants of railway clocks have been divided into 100 minutes.

It is certain that the great advantages of this



New Sedilia for Cheltenham College Chapel.

new method of the division of the circle will render it popular among scientists, and that in the course of time we shall see its general adoption.

SEDILIA FOR CHELTENHAM COLLEGE CHAPEL.

It is intended to place Sedilia in the new chapel of Cheltenham College as a memorial to the late Archbishop of Dublin, who was an "Old Cheltonian." They will consist, as shown in the drawing, of the usual three canopied seats and a Credence. Church stone will be employed, and the work will measure 14 ft. in width and 18 ft. in height. Mr. H. Prothero (Messrs. Prothero & Phillo) is the architect.

THE SCENIC SETTING OF "JULIUS CÆSAR."

SHAKESPEARE'S "Julius Cæsar" being a play in which the action lies for the most part in ancient Rome, the treatment of the scenery is a matter of some interest in an architectural sense. It is understood that it has been carried out under the advice of Mr. Alma-Tadema, whose familiarity with Roman detail and ornament is of course well known.

There is rather a tendency among dramatists and dramatic critics to regard historical accuracy as of little consequence in scenes of this kind, provided that a generally good scenic effect is obtained; and this no doubt is all that the general playgoer cares for; but it must be remembered that the number of those who take an intelligent interest in archaeology is increasing, and that the most cultivated portion of the theatrical audience are not now so easily satisfied as formerly in regard to these matters. And even were it not so, it is worth while to have the scenic setting correctly carried out as a matter of artistic feeling, as well as for the air of greater realism which is imparted to the scene, even without the spectator knowing why. Something which resembles the actual architecture of the site and period, as far as is

known, is likely at all events to look more real than details merely produced out of the scene-painter's imagination.

In this respect the manner in which "Julius Cæsar" has been placed on the stage merits recognition. It is the best thing of the kind that has been done at a London theatre for a long time past; perhaps, architecturally speaking, it is the best in this sense that any London theatre has produced.

The first scene, "a Public place," is not identified with any special site; it is very effectively arranged, the spectator looking into the scene under the shadow of a large arch with a coffered soffit. The long building seen at the back, with two stories of engaged columns, and arches between them, and a statue in the centre of each arch, reminds one of Mr. Tadema's restoration of the Colosseum in his Academy picture of two years ago, and hence rather suggested an anachronism; it looks somewhat like a part of the Colosseum "on Mercator's projection," rolled out flat. We shall see, however, that there is authority for an erection of this kind in another situation; nevertheless, this is the only building shown in the scenes which has somewhat the appearance of being mere stage architecture put in to make a background, and not suggesting to one what kind of building it is meant to be. The second scene, "Brutus' Orchard," is charming in effect; and at once suggests the hand of Mr. Tadema, who must, we should think, have sketched the complete scene. We look from out a portico with two red marble columns which cross the picture, into a mass of trees above which rises a precipitous bank or cliff beyond the ridge of which is seen the upper portion of a temple. A characteristically designed seat, on a curved plan, is conspicuous in the foreground. The whole is a charming picture with a completely antique air about it.

"Cæsar's House" seems, as to general idea, to be somewhat suggested by Mr. Poynter's picture which will be remembered at the Academy some years ago, but there is a great deal more decorative detail shown, giving a

rich effect of colour perhaps a little out of keeping with the general idea of Rome before the Empire; but on the other hand it is reasonable to suppose that Caesar may have made a special expenditure and show in his own house, in keeping with his ambitious programme. There is a little defect in perspective in the treatment of the right-hand wall of the interior, the lines of the upper portion not coinciding with those of the lower portion. We may pass over without special remark scenes 4 and 5, the "Public Street" and the "Senate House"; as to the latter, we are so totally without data for the interior restoration of the Senate House that, provided only the details are such as might occur in Roman architecture and decoration, every one may have his own idea. The employment of the well-known Roman mosaic ornament, representing cubes in perspective, upon the upper portion of the walls, seems rather doubtful; it is a bad ornament any way, but seems at all events more like one for a floor than for a wall.

The scene for the second act, "The Forum," is the one on which the greatest care has been bestowed, and in which we can really follow the actual lines of the site and of the ancient buildings. At the right hand of the stage is seen part of the rostra, from which Antony is to speak; the spectator is at the north corner of the Forum, and looks across obliquely to where the raking walls of the Clivus Capitolinus are seen, and below them in the angle the row of columns before the shrines of the *Dii consentes*, not, as they now remain, slender Corinthian columns, but the shorter and more sturdy columns of an earlier age. On the right rises the mass of the Tabularium, treated much like the background building mentioned in the first scene, two tiers of engaged columns and arches between them. The lower tier of these arches, or part of it, actually exists behind Michelangelo's masonry, and one of them has been uncovered in recent times; so that here we are on a pretty firm footing; and Middleton quotes Poggio to the effect that, in his day, a second story existed above the lower one. The openings of the arches are occupied by statues, an arrangement which looks a little too rich and ornate for the period; but otherwise this building justifies itself as a probable rendering of this portion of the surroundings; the building looks real here, although the same architectural treatment spread out as a background to Scene I, looks unreal and "stagey."* On the left of the scene rise timber-built booths or shops in two stories; this again is historical, these are the *Tabernae veteres*, on the site afterwards occupied by the Basilica Julia. The temple which shows its front beyond the Tabularium is imaginary, or at least not to be identified with anything historically known; but otherwise the scene is really to a great extent a restoration.

The reality of impression conveyed by the structure of the scene is carried still further by the admirable drilling of the crowd of personages who fill the stage and represent the common people of Rome assembled to hear the speeches. The result shows what can be done in the way of realism by good stage management and intelligent "supers." The crowd is a real living crowd, swayed to movement and comment by every point in the speech; there is all the noise and movement and excitement of an actual crowd; and when the line, "there's not a nobler man in Rome than Antony," is shouted out by someone in the upper balcony of the shops, at the top of his voice, as if determined to make himself heard above the noise, one gets quite a feeling of illusion—of being present at a real and not an acted scene.

One must also recognise the admirably effective manner in which the ghost is managed in the scene in the tent of Brutus. As to the battle, battles are impossible on the stage; the best has been done that could be, perhaps, by making the foreground a kind of ravine, where the leaders can specify each other, and from which the troops can be seen passing, and the noise of the battle can be heard. It might be possible to produce a realistic battle effect on the stage, but it would involve more expense and trouble than the result would be worth.

But as a whole this is an admirable effort in the way of scenic effect and stage manage-

ment, and is worth seeing on that account alone. Dramatic criticism in the usual sense is not properly within our limits, but one cannot leave the subject without a word as to acting. Mr. Tree's "Antony" is very carefully studied, and his delivery of the famous speech fine and effective; all the more so from the support it gets from the trained acting of the crowd, as a piece of oratorical effect, however, it does not rise to genius; there are passages in the speech where one could fancy a far greater effect being given to the words. Mr. Fulton, who makes up as Caesar with a striking resemblance to the original, is successful in producing the impression of a strong and masterful personality, the sort of person who, as Cicero said after meeting him at dinner, made himself agreeable enough, but was hardly the sort of guest you would clap on the shoulder and say, "Well, old fellow, look in again any time you're inclined." Mrs. Tree gives interest and individuality to the small part of the boy Lucius, though it would be impossible, at some points, to take her action for that of a boy; and one of the best acted bits in the play is Mr. Calvert's rendering of that dry and blasé gentleman, Cæcia, in the first scene.

As one matter of detail, are not the swords used by the conspirators somewhat improbable? If they are intended to represent the characteristic short and broad Roman battle sword, they seem hardly wide enough. But would not the conspirators rather have used some kind of short dagger, more easy to conceal in the cloak than these comparatively long weapons?

CONDITION OF BOW CHURCH.

The following reports on the condition of this church may be of interest at the present moment. The first is the report of Messrs. Walter A. Hills & Son, architects, made rather more than a year ago; the second is the report, dated two days later, of Sir Arthur Blomfield & Sons, who were called in as consulting architects:—

"147, Bow-road, London, October 27, 1896.
GENTLEMEN,—In accordance with your instructions we have examined the fabric of the chancel, and beg to report as follows:—

The roof is in a very dilapidated condition, the tile lathing being completely perished; the heavy oak timbers are mostly (but not all) worm-eaten and rotten. There are evidences that a partial failure of the roof occurred at some remote date, and that the main tie was spliced, and the other timbers strengthened with iron ties.

The walls of the chancel contain many loose stones, which must fall at no very distant date. The masonry is thoroughly rotten, and the apex of the gable is much out of plumb.

The panels of the ceiling of the chancel are merely thin boards.

Large portions of the tiles have recently been dislodged; should the next dislodgement fall inside the roof the boarded ceiling would not stop the debris from being precipitated on the chancel floor. It would be of very little use to strip the roof and relay the tiles, as most of the timbers are rotten; we, therefore, beg to recommend that the weather be kept out with tarpaulins, and the chancel closed until the fabric be rebuilt. We should, however, be glad to communicate with your consulting architect before any steps be taken (except the provision of tarpaulins).—We are, gentlemen, yours faithfully,

WALTER A. HILLS & SON.

To the Rector and Churchwardens,
St. Mary, Stratford, Bow.

"6, Montagu-place, Montagu Square, W.,
October 23, 1896."

Re Bow Church.

DEAR SIRS.—We write to confirm the decisions arrived at to-day at our consultation with yourselves at the above church. We are of opinion that the usual Sunday services may be held this Sunday, the 25th, with perfect safety if the weather continue fine and calm.

We consider, however, that the walls of the chancel are in a dangerously decayed condition as regards the external facing of stone, which is about 9 in. thick, and that it will be necessary to rebuild them entirely, as the decay externally is still proceeding; and we consider that no expedient short of this is to be recommended.

We quite concur in the opinion expressed in your report, dated October 21, with reference to the roof.

—We are, dear sirs, faithfully yours,

ARTHUR W. BLOMFIELD & SONS.
To Messrs. Walter A. Hills & Son, 147, Bow-road, E."

ST. MARY'S CATHEDRAL MISSION BUILDINGS,
DALRY, EDINBURGH.—This building is now in course of erection in Caledonian crescent. Mr. Henry F. Kerr is the architect.

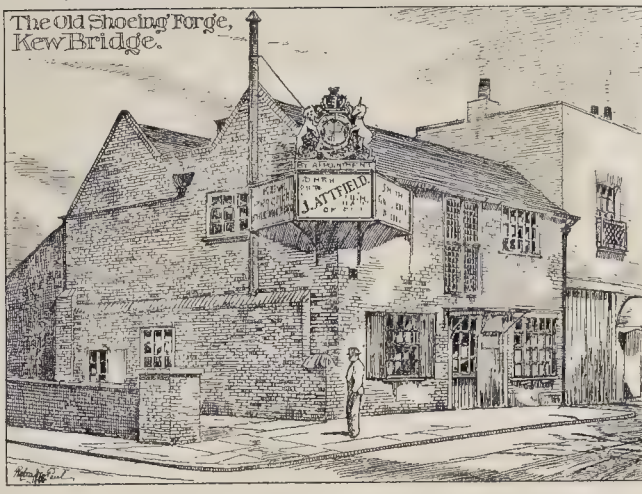
ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The seventh meeting of the present session was held at 56, Great Marlborough-street, on the 26th ult., Mr. H. J. Leaning, vice-Chairman of the Section, occupying the chair. The paper of the evening was entitled "Architectural Commission, Who Receives It," by Mr. Ernest Herbert. It was an attempt to define the relations existing between the public and architects, and deal with the custom which govern their remuneration, the reasons why they are employed, and the causes which lead to their work being taken up by persons outside the profession. If, he said, the architect held the position which, by virtue of his attainments, he should do in these days of building activity, he should be a respected, famous, and prosperous man, whereas he was, generally speaking, unknown, unappreciated, regarded with suspicion, and somewhat out at elbows. The public had got the idea that 5 per cent. on the estimate should be a maximum charge for architectural work, but for small works this was barely remunerative. The architect was often paid, for more onerous work, at a lower rate than the auctioneer and surveyor; for instance, with regard to dilapidations, the Royal Institute of British Architects fixed a charge of 5 per cent. with a minimum of two guineas, while the Surveyor's Institution, the society of Auctioneers, and the Committee of the Estate Exchange, fixed the minimum at five guineas. The client was guided in his selection of an architect, firstly, but too rarely, by the gauge of merit; secondly, by a monetary standard, which made him unwilling to entrust a man with a 10,000l. job who had never done anything more than a 500l. one. The feeling of distrust which the public had for the architect was mainly as to his efficiency to deal with a large sum of money, quite apart from his merits as an architect. Deserving men were often debarred from winning competitions by the discreditable action of competitors who brought influence to bear on the committee of selection in favour of a particular style, and by obtaining information withheld from the other competitors. The profession ought also to set its face against the practice of some architects employing men outside their office to prepare showy designs which they passed off as their own. Mr. Herbert then proceeded to describe the various people who absorbed work which would otherwise probably fall to the lot of the architect to carry out. The official architect was a rarity in this country, and when he was appointed the necessary qualities of an architect were generally recognised. The "middleman" was a dominant factor; the freeholder's surveyor, the quantity surveyor, the auctioneer and estate agent, who had better opportunities than the architect of influencing the public, often had the disposal of his work and did not scruple to take a share of his commission. The commercial architects were another class—those who took up the profession merely as a means of livelihood and who employed draughtsmen to produce their designs. Many of our provincial towns did not possess a resident architect, such work as was done by the local men, calling themselves architects, was the product of their inefficiency, aided by the efforts of some unfortunate architectural assistant who covered up with meaningless ornament the inanimate designs of his master. He then alluded to the architectural work carried out by borough surveyors and engineers, and referred to the recent action of the Institute of Architects of Ireland in protesting against the "practice of appointing as a nominal architect any person with whom it is proved necessary to associate a qualified architect in order to ensure the preparation of proper plans, &c." He concluded by suggesting that the useful work of the Association in training architects should be extended, and a Union, comprised of architects who design, and qualified assistants, might be formed, who could, if they wished, organise a strike against the incompetent architect. In summing up the discussion which followed, the Chairman alluded to the custom prevailing in Germany and Austria, where the builder employed the architect, surveyor, and workmen, and the architect was but a salaried officer.—The next meeting will be held on the 23rd inst., when Mr. P. L. Marks will read a paper entitled "Correct Principles of House Planning."

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A dinner in commemoration of the twenty-first anniversary of the founding of the

* It may be that this first scene was meant to be looking up the Forum and seeing the Tabularium at the upper end, but then the building in that case shows no indication of the hill behind it, against which it was backed, so to speak.

eds and Yorkshire Architectural Society was held at the "Queen's Hotel," Leeds, on Monday. George Corson (President of the Society) was in the chair, and amongst those present were the Lord Mayor (Alderman Tetley), Mr. S. Braithwaite (Vice-President), Mr. W. M. Fawcett (Vice-President of the Royal Institute of British Architects), Mr. W. B. Woodhead (President of the Bradford Society of Architects), Mr. E. Matheson (President of the Leeds Chamber of Commerce), Mr. A. T. Walker (President of the Association of Yorkshire Architects), Mr. G. Benson (President of the Yorkshire Architectural Society), and others. After loyal toasts had been honoured, "The Lord Mayor and City Council" was proposed by Mr. W. H. Thorp, who remarked that the architects as professional men would do their best to beautify the streets of Leeds. The people in many parts of the city had squalid surroundings. He hoped that before very long this evil would be remedied. He expressed a hope that the scheme for making a suburban railway might be carried out.—The Lord Mayor, in responding, said that there was plenty of work for the City Council to look forward to. One of the things upon which the Council would be most congratulated, if they accomplished it, was the making of streets direct from the centre to the outskirts of the city. If architects would spend a few hours from time to time in sketching a plan for making direct communication between various parts of the city, they would be doing a work almost of charity. There were means of communication in some directions, but the city largely required cross streets. If architects could only devise a system of boulevards and broad streets in the centre of the city, he was sure it would be greatly valued by the City Council. He drew a comparison between the cities of Buda-Pesth and Berlin. In the former, before 1870, the death rate was forty-five per 1,000. After the war of 1866 the municipality and the architects of the city set to work, made the streets, which went right through the most important parts of the town, and then cross streets. The result was that places which were formerly nests of fever were turned into salubrious parts. Now the death rate of the city was only twenty-four per 1,000. The reduction was simply due to there being more light and air and better water supply. Compare this with Berlin, which was generally considered a much more crowded city. In Berlin, where there were tenement houses, ten years ago there was one district, with a population of 73,000, in which the mortality was no less than 163 per 1,000. Nearly half the deaths in Berlin were attributable to the conditions under which the families in tenement houses lived. Although in Buda-Pesth 60 per cent. of the inhabitants were living in one-roomed houses, owing to the fact that most of them were one-storied dwellings, the death rate was never more than between thirty and fifty per 1,000. Therefore the system of small, low, back-to-back houses was not in any way to be condemned, and had a great advantage over tenement houses in crowded cities, inadequately supplied with light and air. Such as they might despise and wish to do away with back-to-back houses, there was something to be said for them. Leeds must look to the architects to assist, not only in arranging the streets, but, if possible, in raising the standard of beauty and proportion to something like that of Paris, which was so much admired. The first thing to be done was to make the streets sufficiently wide, and insist that the houses put up should be of a certain height. In walking through Regent-street, in London, no one could fail to notice the proportion between the heights of the buildings and the breadth of the streets. In Paris the regulations with regard to the height of the houses were very stringent. The buildings there must be in harmony with the streets. If the architects of Leeds could induce Mr. Batley and his colleagues on the Building Clauses Committee of the City Council to form a scheme which would secure that buildings of one kind were erected on one street, and buildings of another kind in another street, Leeds, in the future, might be admired not only for its commercial enterprise, but also for its beauty. If these regulations could be enforced by nations which we looked upon as "mere stuffy foreigners," surely Leeds ought to be able to do something for the improvement of the city, and the conditions under which the people live.—Mr. E. Wilson then gave "The Royal Institute of British Architects and Allied Societies."—Mr. W.



M. Fawcett, in responding, referred, amongst other matters, to the Institute examinations, which were having a very beneficial effect. Mr. John Ely also responded.—In proposing "The President, and the Leeds and Yorkshire Architectural Society," Alderman Gordon said that the present generation of architects had done much for the city. Architects were scoffed at for increasing their estimates, but he was sure that the fault lay with the employers who had weak purposes and no knowledge of the subject. He acknowledged how much the architects had done for City-square. Architects in Leeds had not the same chance as in some other cities. The atmosphere, for one thing, was against them. There was something more than beauty of form to be considered in architecture; there was beauty of colour. In Leeds, the beauty of colour could not stand against the attacks of the atmosphere; but some of the buildings of the city—notably the Town Hall—showed that a true and beautiful form would dwell long after the building had been blackened by soot.—The Chairman, who responded, said that if the Corporation had begun many of the improvements which were now being carried out twenty or thirty years ago, it would have been much to the advantage of the ratepayers. Thirty years ago, the Council intended to widen and improve Lands-lane, but this was only being done at the present time. If the improvement had been carried out when the proposal was first made, the work would have been done at one-third of the cost at which it was now being done. Referring to the congested districts in the east end of Leeds, the Chairman suggested that suburban villages might be made for the working classes.—Mr. H. Perkin proposed "Art, Science, and Literature." The toast was responded to by Mr. M. C. W. Flower. Mr. A. T. Walker and Dr. Bodington also responded.

GLASGOW ARCHITECTURAL ASSOCIATION.—At the usual monthly meeting of this Association—the President, Mr. W. T. Conner, in the chair—Mr. Wm. Brooks Sayers delivered a lecture entitled, "Electric Light, Heat, and Power—their Efficient Installation and Cost." The lecturer opened his subject by drawing a picture of what electricity could do to lighten the burden of existence. With electric light, heat, and power we would have no smoke, filth, or suffocating fogs, thus leaving everything fresh and clean without and within; we could pave our streets with asphalt, over which the rubber-tired motor vehicles would skim noiselessly. A descent, however, to the practical showed that much progress had yet to be made, which Mr. Sayers demonstrated by tables and figures, comparing the cost of electricity, gas, and water, supplemented by a description of the different systems and apparatus for electric lighting, illustrated by examples.

REOPENING OF BEBBINGTON PARISH CHURCH.—This building has just been reopened after restoration. The work has been carried out under the supervision of Mr. Charles Pearson, Rock Ferry.

THE OLD SHOEING FORGE, KEW BRIDGE.

THIS building stands on the north side of the Green, close to the southern end of Kew Bridge. It will doubtless be swept away when the bridge itself is rebuilt, and although, perhaps, of no great architectural beauty, it is of interest as a picturesque feature of the Green which might be destroyed at any time to make way for the new work. The window over the porch retains its old leaded lights and solid frame, and is probably, with the porch itself and the small bay window adjoining, original. The other windows are later, perhaps, in date. At the angle is an excellent example of the Royal Arms.

SURVEYORS' INSTITUTION: STUDENTS' PRELIMINARY EXAMINATION.

OF the candidates who presented themselves at the preliminary examination of this Institution, held concurrently in London, Manchester, and Dublin, on the 19th and 20th ult., the following satisfied the examiners:—

R. W. Alderson, Cirencester; F. T. Allen, Lewisham; C. E. Amore, Brixton; A. L. Berry, South Croydon; E. W. Booth, Hiley; C. G. Bradley, Wolverhampton; T. Brent, Shooters Hill, Kent; H. Brooker, Steyning; E. M. Browne, Kingsthorpe; G. J. Bruzard, Addleston; A. E. Buckley, Halifax; W. Burman, Kiveton Park, Sheffield; T. L. Caton, Brixton; C. V. Chilwell, London; R. Cobb, Higham, Rochester; A. G. S. Cooke, Ashbourne; G. F. Cotching, Horsham; A. H. Dallschaft, London; W. J. Dann, Gravesend; W. J. Dixon, Welwyn; C. H. Donne, Leek Wootton; J. W. Earle, Woolton; C. W. Eastwood, Malton; C. J. Elgar, Wingham; H. Etlinger, Dublin; F. Fletcher, Whetstone; W. Foster, Hampton Hill; W. Fox, Bournemouth; C. G. French, East Finchley; K. G. Gairdner, Highgate; A. Gimson, London; E. B. Glasier, Wimbledon Park; J. C. Goff, Aspatria, Carlisle; F. A. S. Goodbody, Birmingham; A. Goodman, Clapton Common; R. G. Gurney, Aylesbury; C. A. Hall, London; G. Harding, London; C. P. Harrison, Caerhowel; E. Harrison, Bolton-le-Sands; S. W. Hider, Upper Tollington Park; E. C. Hill, Whitson, Lytham; J. H. Hinchcliff, Leeds; M. A. Hindmarsh, Alnwick; R. T. Hodge, Wimbledon; C. J. Hudson, Bridlington Quay; A. C. Hughes, Birmingham; H. Hunt, London; P. Hurlbutt, Downton; C. W. Ingram, Lewes; F. Johnson, Erith; A. B. Jones, Kew; H. D. Kelleway, Cambridge; P. R. Kemp, Preston; F. C. Knibb, Wandsworth-common; H. Lisney, Sydenham; C. Living, jun., Plaistow; P. J. May, Brighton; T. I. Mercer, Coventry; H. A. Mitchell, Brighton; C. E. J. Monson, Newark-on-Trent; C. P. Moss, Crouch-hill; A. E. Oaten, Bristol; H. E. Perks, Bedford; G. L. Potter, Walthamstow; C. E. Rawlins, Liverpool; H. T. Richardson, Lee; H. H. Riddle, Tooting; G.

* Passed at head of list.

C. Rowe, Sutton; W. J. Shaw, Leeds; L. E. Shone, Whitchurch; J. H. Simpson, Bicester; W. J. Slipper, Chelmsford; C. H. Smith, Caine; Q. C. Smith, Muswell Hill; H. Soper, Brighton; F. E. Spalding, Hampstead; P. A. Stanley, Burton-on-Trent; F. E. Strudwick, Bromley; G. D. Sweetman, Ryde; H. J. Tilley, Watlington; J. R. Tonson-Rye, Aspatria, Carlisle; E. D. Tredinnick, Craven Arms, Shropshire; J. T. Turner, Dalton; R. P. Vale, Hartlebury; C. H. Vince, Halton; G. D. Wadham, Dalton-in-Furness; G. R. Walker, Long Ashton; L. M. Walton, Bexley; W. H. J. Weston, Ashford; F. W. Wheeler, Fulham-road; L. E. Wilson, Lincoln; W. A. Willshire, Reigate; L. Wragg, Loxley; K. J. Young, Brixton.

THE HASKIN METHOD OF PRESERVING TIMBER.

AN interesting demonstration of the process of preserving timber, as developed by an American engineer, Colonel Haskin, was given to members of the Press by the Haskin Wood Vulcanising Company, Limited, at Samuda's Old Shipbuilding Yard, at Millwall, on Thursday, January 27 last. The works are by no means of an experimental character, the buildings and machinery erected being thoroughly substantial and capable of dealing with immense quantities of wood.

The process consists in subjecting the raw, unseasoned wood in long cylindrical chambers to the action of compressed, circulating air, heated to a temperature considerably above the boiling point of water. After being thus treated for a number of hours, the wood is allowed to cool down in air under the same state of compression. It is claimed that after this treatment the wood is strengthened, hardened, improved in appearance, more impervious to water, and, above all, is rendered far less subject to decay.

The beneficial effects of wood creosote in the preservation of timber are well understood, but when that substance is applied it is always done outwardly, and the creosote soaks in as far as it may. In the Haskin process the products of distillation are antiseptic and closely resemble, if they are not practically identical with, those produced by creosoting. Therefore, this process may be said to retain the creosote in the wood, in the main, and the products of distillation of the bulk of timber themselves lead to its own preservation. No additional creosote is employed, nor indeed anything but air under great pressure and high temperature. The essence of the process consists in not permitting this destructive distillation to go too far, else the timber would become brittle, and be rendered useless for practical purposes. The inventor appears to have succeeded in developing these antiseptics in such a manner as that they do not migrate far within the wood from the spot where they are generated. As before mentioned, some portion undoubtedly escapes, the surfaces of treated blocks bearing evidence of the fact; in this connexion it would be interesting to have analyses of the air withdrawn from the cylinders.

Owing to the high atmospheric pressure under which the wood is heated, the water of the sap is not converted into steam, and ebullition does not occur within the pores of the wood. It is stated that appreciable quantities of phenols and terpenes—long known as preservatives—are formed, and the albumen coagulated, by the reactions which occur, and that the oily matter formed fills the pores and saturates the fibre of the wood.

The whole process is remarkably simple, and should time corroborate the statements as to the effects produced, the inventor is to be congratulated upon having made a most valuable discovery; but there is a certain vagueness and meagreness of detail in the description of the process with which we have been favoured. Thus, it is said that, "the great value of the process is, due to its fixing this 55 per cent. of fluid matter (wood sap) within the wood in condition so that it cannot ferment or vegetate; neither is it liable to dissolve or wash out, but is evenly distributed, filling the wood cells and ducts, debarring entrance to moisture or germs of decay." Now a great part of this 55 per cent. of fluid matter is uncombined water, and we should like fuller information as to the manner in which it is fixed, so that it cannot evaporate. We can understand that through coagulation of the albumen and formation of antiseptic

compounds, the process may be very valuable, but surely these do not fix all the free water.

Again, according to tests made by Trautwein, the modulus of rupture of transverse stress was increased 21 per cent., and according to Thurston only 84 per cent. Why this discrepancy? Is it due to difference in the variety of wood treated and tested? Surely it is strange that if pitch pine is increased 21 per cent. the yellow pine, apparently tested by Thurston, should be increased in strength only 84 per cent. It is worthy of note that, according to Trautwein's tests, the compression strength of pitch pine is increased from 5,000 lb. to 7,294 lb., or, in other words, to that of English oak.

In regard to the machinery, a few words will suffice to explain it, there being nothing of a very complicated nature. Three Galloway boilers, capable of working at a pressure of 200 lb. per square inch, provide all the steam required. There are two air-compressors and two circulators for keeping the compressed air in motion in the cylinders. But before reaching the cylinders the air is first of all deprived of its moisture, as far as possible, and is then pumped by the circulator through tubes heated by live steam, and afterwards through pipes heated by coke fires. By this process the compressed air is heated to about 400 deg. Fah., and is then passed on to the cylinder or cylinders in which the wood to be treated has been placed. These cylinders, four in number, are 113 ft. in length, have a diameter of 6 ft. 7 in., and each is capable of treating 1,400 ft. of timber. Each is closed by a curiously constructed door or lid, which lifts upwards, being counterpoised by weights and controlled by a hand wheel. The closing bars are shot simultaneously into slots by one operation actuated from the centre of each door. The timber to be treated is landed on a wharf close by, placed on trolleys, and run direct on rails into the cylinders.

The whole preserving process takes from six to seven hours to perform, and prior to withdrawal from the cylinders the temperature and pressure are, of course, gradually slowed down.

Obviously, it was impossible in the course of one day to demonstrate the applicability of the Haskin method to all of the principal kinds of wood, but we were shown several samples, and were assured that any class of wood could be satisfactorily treated. We had hoped to have received some samples to aid us in forming an opinion of the value of the process, by a close micro-examination. These would doubtless have enabled us to state as to where and how far the distillation in the treated wood had gone on. Failing these, we cannot give such a decided opinion as might otherwise have been the case; but we have no hesitation in saying that there is a great future for "Haskinised wood." We see no reason why, in many respects, it should not take the place of wood seasoned by ordinary natural processes, and it has already usurped the place of much ordinarily creosoted wood in the United States. This method should have considerable effect on the price of seasoned timber; no storage for years is requisite, and there is, consequently, considerable saving in rent and loss of capital, and the material seems at least quite as durable. Green wood may be treated, and is, in fact, preferred.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Dr. Collins (Chairman) presiding.

Loan.—On the recommendation of the Finance Committee, it was agreed to lend the Managers of the Poor and Steepney Sick Asylum District 5,800*l.* for alterations and additions to Bromley Asylum.

Conditions of Contract.—The General Purposes Committee brought up the following report:—

"In our report to the Council on November 30, we referred to a letter from the Institute of Builders on the question of amending the standing orders relating to the conditions of building contracts. A copy of the report of the Committee and resolutions of the Council were forwarded to the Institute, and the following reply has been received, which we report for the information of the Council:—21 and 23, Bedford-street, Strand, W.C., London, January 11, 1898. Sir,—Your letter of the 20th ultimo with enclosures was laid before my council on the 4th instant, and I was directed to thank you for it, and to acknowledge that the proposed modifications are satisfactory so far as they go, though they leave the conditions still very onerous and stringent. The proposed arbitration clause would be more accept-

able if modifications were made in several of the other clauses, which in their present form do not come within the operation of the provisions of the arbitration clause. The contract form might be much more concise, and there is in it so much that gives a possibility of petty disputes that it is doubtful whether builders who can find sufficient work in other directions will trouble to compete under such conditions. The Council would be much better served were they only to invite selected builders, and adopt a simple form of contract, the provisions of which London builders are conversant with from constant use. The whole of the stipulations in regard to securing that contractors shall pay the standard rate of wages and observe the customary hours of working is altogether unnecessary, as it would be quite impossible for a contractor to carry on his business unless he conformed to the agreements in all these respects. The introduction of such clauses into contracts accentuates the difficulties which large employers of labour necessarily experience in the conduct of their businesses.—I am, Sir, your obedient servant, R. S. HENSHAW, Secretary. To the Clerk of the London County Council, Spring-gardens, S.W."

Taxation of Ground Values.—The Council then discussed at length the question of the taxation of ground values. On December 7 it was resolved:—

(a) That it is advisable that a new source of revenue should be obtained by means of some direct charge upon owners of site values.

The following were the next recommendations of the Local Government and Taxation Committee:—

(b) That this charge be termed "owners' tax."

(c) That all persons deriving a revenue, or use equivalent to a revenue, from the value of a site, be liable to pay such charge.

(d) That the site value of every property be assessed and entered in the valuation list.

(e) That the site value be the annual rent which at the time of valuation might reasonably be obtained for the land as a cleared site if let for building by an owner in fee, subject to equitable reduction in exceptional cases in which the full site value thus defined is not being enjoyed or obtained by any person or persons.

(f) That in view of the fact that considerable expenditure has been incurred from public funds which has largely contributed to the increase of site value, the Royal Commission be asked to recommend that such owners' tax commence at the rate of 1*d.* in the pound per annum, and rise gradually to such sum as Parliament may determine, and that any increase of burden or expenditure for new services should be equitably shared between the present rate on occupiers and the proposed owners' tax.

(g) That any existing or future contract or agreement by which an owner purports to exempt himself from the owners' tax, or to cause it to be paid by any other person in his stead, be invalid.

(h) That vacant land and empty property shall be liable to pay the owner's tax upon the site value appearing in the valuation list.

(i) That the Royal Commission on Local Taxation should also be informed that the Council is in favour of a municipal death duty upon immovable property held by individuals within the county with an analogous charge on such property when it is vested in bodies corporate or unincorporate.

Recommendations *b* to *g* inclusive having been agreed to after a long discussion,

Sir H. Poland, on *h*, pointed to the case of pleasure grounds of private owners as one which made the suggestion ridiculous. It was an attempt to penalise owners who did not cut up their land into building sites. He supposed in the case of the Temple Gardens, the Benchers would be let off because for a few months they let ragged children play in their grounds. But such gardens as those of Holland House, or in Belgrave-square and elsewhere, would be taxed in such a fashion as enormously to increase their cost. It was difficult to sit quietly in the Council and submit to such nonsense as that.

Mr. Costelloe said the Progressives felt that the system of putting the whole of the taxes on rateable value was wrong, and they had the courage of their convictions. So long as people kept open shops in London for their own benefit, maintaining for themselves a lordly background, then they should pay the full value upon it.

The Progressives called for a division, although the Chairman declared the recommendation carried. There voted for the recommendation 56, against 48.

On recommendation (i) Mr. Alderman Beachcroft moved, "That the recommendation be referred back to the Committee with an instruction to consider and report whether, in lieu of informing the Royal Commission that the Council is in favour of a Municipal Death Duty, it would not be preferable to suggest that

tain share of the Estate Duty now levied London property should be allocated to don local taxation."

r. Fletcher seconded the amendment, which was agreed to.

further amendment by Mr. Cornwall, tting all in the amended resolution from word "that," down to the second word at," was opposed by Mr. Beachcroft. It, however, carried.

Mr. M'Kinnon Wood moved the adjournment he debate on other recommendations of the e committee, which was agreed to.

Protection from Fire in London.—Colonel on moved the reception of a long report of Fire Brigade Committee. The Committee recommended:—"That the estimate of 107,185*l.*, mitted by the Finance Committee in respect he provision of additional protection from in London be approved." The report ated what had taken place since the ncil came into existence in connexion with question of improving the means of pro- tion from fire in London, and contained the owing statements:—

The distinguishing feature of the scheme of 1894 is the stationing principally in the urban districts of men with appliances sufficient saving life, and holding in check if not altogether ing with any small outbreak, but who would be called away to any great distance from their ctive stations. In other words, their effective ere of action would be a radius of, say, a quarter a mile from the point where they were on duty. The distinguishing features of the present chief er's proposal are (1) distribution of the men in stations at each of which horses shall be l) from which they may in case of need be wn, and concentrated wherever required; (2) ensing with certain existing street duties within adius of, say, three-quarters of a mile from ation at which there is a fire-escape capable eing drawn by horses; and (3) keeping two s of horses at every station at which a steam engine, as well as a horsed escape, is kept. will be seen that the principal difference een the two schemes is the character of the sub- tions, but, after careful consideration, we agree in the opinion of the present chief officer that stations with two or three men who are without as of proceeding quickly with suitable appli- es to a distance of more than a quarter of a mile not provide the best means of protection. It is e that within a short radius of such a station the ction afforded may be all that is required, but e beyond that radius the inhabitants are practi- lly little if any better off than if they were a mile in a station at which there is a fire-escape drawn horses. We may mention that at present only e sub-stations have been established, namely, at rth End, Fulham, Lee Green, and Battersea rk-road. As regards the second feature of the v proposals, we may state that when the mmittee submitted the 1894 scheme the Brigade sessed only one (the original) escape drawn by es, but the utility of the horsed escape had by at time been so clearly demonstrated that an order d been given for six more of such appliances. rther, it was, of course, foreseen that the extensive ption of horsed escapes would render it unneces- y to retain many of the existing escapes stationed the streets; and the chief officer's recommendations in this direction are, therefore, what we antici- ated, and they have our full and cordial approval. The rd feature, that of keeping two pairs of horses at tions equipped with steam fire-engines, and esed escapes is the natural consequence of the op- tion of the latter appliance.

It may be interesting and convenient to state e general principles which, in the opinion of e Chief Officer, should govern fire brigade work in ondon. They are as follow:—(1) It should be cticable to concentrate 100 men under fifteen lautes in any dangerous area for large fire currences. (2) On any call the firemen ought, the machine leaves the station at once, to reach e scene of the fire in less than five minutes. (3) he principle of station work should be this: each ation is responsible for a certain area, and on any e occurrence within that area the station com- ndered should be prepared at once to use its entire rength, with two or more appliances and reserve ores, if necessary, at that fire, the first suppli- ential aid coming from the adjacent stations. (4) In order to do this effectively at each station there hould be—*First*—Choice of apparatus. *Second*—A d proportion of men on duty at the station. *Third*—Sufficient firemen and a coachman ready lothed to ride at once with the first machine, two es being also in readiness, so that the first turn- up may be a matter of seconds instead of minutes. (5) A sub-station should have one man at least esides the duty man ready clothed, to assist in orsing the escape, or if necessary, to run the station escape by hand.

Before dealing specifically with localities in which e recommend the establishment of stations, we ask e Council to endorse the principles of the revised cheme. We may mention that we propose that a sub-station shall occupy the same space as a full

station, and that the engine-room and stable shall in each case be of exactly the same size. In the event, therefore, of it being hereafter considered desirable to convert a sub-station into a fire-engine station, it will not be necessary to increase the area occupied by the building. It may in such a case be necessary to add a floor to the building, but even this may be obviated by drafting to the station single men. In this connexion we may mention that we propose that in new stations separate quarters shall not be specially provided for single men as has usually been the case. One set of married men's quarters can, if necessary, be utilised for the accommodation of three single men, and two sets would conveniently accommodate six or seven. We recommend—(b) That the Council do decide that each fire-engine station shall be equipped with at least a steam fire-engine, a fire-escape drawn by horses, a hose-cart, and a light manual escape, and that the staff of the station shall consist of one officer, nine firemen, and two coachmen, with four horses. (c) That the Council do decide that each sub-station shall be equipped with at least a fire-escape, drawn by horses, a hose-cart, and a light manual escape, and that the staff of the station shall consist of one officer, five firemen, and one coachman, with two horses. (d) That the Council do approve the principle of dispensing, as a rule with fire-escape and hose-cart stations within a radius of about three-quarters of a mile of a station at which there is a fire-escape drawn by horses."

Colonel Rolton, Chairman of the Committee, said when they took over the Fire Brigade a proposal was made by the then Chief Officer (Captain Shaw) to expend 284,000*l.* in building new stations and improving the appliance. Out of that amount they proposed to build thirty-two new stations; but of those only four had been built. Under Captain Simonds they agreed to spend 102,500*l.*, but of that only 15,000*l.* had been spent, and chiefly on sites. Since Commander Wells was appointed as Chief Officer, he had made a series of recom- mendations from time to time. Before the long vacation last summer, the Committee called upon Commander Wells to put into con- crete form the various suggestions he had made, and in September he produced a report, which had been published. The Committee had adopted the scheme now before them, as would be seen by the dates, before the great fire in Cripplehead occurred, so that there could be no idea that that was legislation in a panic. The dates absolutely disproved that. That fire did, however, bring into prominence some of the improvements they had in view. The proposals in the report dealt with additional stations—four full and eighteen sub-stations—and the estimated cost of carrying out those proposals was 197,185*l.*, of which 101,000*l.* was in respect of stations and 6,185*l.* in respect of plant. The maintenance would amount to 23,200*l.* The Council was committed to the building of new stations in substitution of existing stations at Islington, Lewisham, Peckham, and Port- land-road. The amount yet to be spent in respect of these might be put down approxi- mately at from 55,000*l.* to 60,000*l.* The Council had already decided to establish additional fire stations at Shepherd's Bush, Perry Vale, and Streatham, and the expenditure yet to be in- curred on these three might be put down at 40,000*l.* The Council was also committed to the erection of a building to accommodate the staff of the Battersea River Station, and also to erect a sub-station at Woolwich. The cost of these might be put down at 10,000*l.* In addition to this work it was contemplated to alter several existing stations. The Council was committed to enlarging and altering those at Hampstead, Mile End, and Battersea, and the cost of this work might be put down at 18,000*l.* As regarded other existing stations, no estimate had been prepared. In fact, only a few sta- tions had yet been selected, and it was quite impossible to say what the cost of enlarging them would be. The Fire Brigade Committee proposed, however, to provide in next year's estimate 3,000*l.*, part, if not all of which would be a charge on rate. The Committee were also recommending the Council to purchase next year for existing stations six steam fire-engines, at a cost of about 2,000*l.*, and to increase the staff of the Brigade by sixty-one firemen, the cost of whom might be put down for maintenance at 4,500*l.* Some of these men might not be required till the autumn. It was also proposed to increase the number of horses hired, but the hiring would be done gradually as fire-escapes and long ladders of the new pattern were delivered. The actual additional expenditure in respect of these horses would next year probably be 4,000*l.* Two fire floats would

probably be ordered, at a cost of from 15,000*l.* to 16,000*l.* Part of this would be a capital charge of 10,000*l.*, and 6,000*l.* would be required for maintenance. This made a total of 337,185*l.* charge on capital, and 37,700*l.* on maintenance. The work would occupy at least ten years in execution, but, assuming that the money were all spent at once, the charge for the first year in respect of redemption of capital and payment of interest would be 14,328*l.* 15*s.*, which, with 37,700*l.* on main- tenance, would amount to 52,028*l.* 15*s.*, equal to a rate of about a-third of a penny in the pound. His experience of the Council was that in every vote brought before the members for the Fire Brigade they had always treated the matter with the greatest liberality and generosity, and he felt satisfied in his mind that that would be the case on the present occasion, when the money was necessary for a comprehensive scheme to enable the Brigade, owing to the rapid growth of London, to cope with any out- breaks of fire and preventing them from be- coming serious.

Lieut-Colonel Ford complained that the Committee formed too much of a "Cabinet," and should have let the Council know before now the state of the Brigade. Until recently the Chairman of the Committee was quite satisfied with the condition and efficiency of the Brigade, for in evidence he had stated that he believed the London Fire Brigade was the most efficient in the world. It was difficult to reconcile the statements of the Chairman. He moved:—"That the following words be added 'but that it be referred to the Committee to consider and report as to whether the Government should not be approached with the view of utilising to a greater extent than at present the services of the police force in connexion with the extinction of fires; and also whether the money contributions from the fire insurance offices and from the Government ought not to be increased.'" He said the Insurance Com- panies were growing fat on the splendid security from fire afforded them in London, and yet they only contributed 28,000*l.* The Government only gave 10,000*l.* a year, and since that sum was fixed the public buildings had doubled in value, and yet it was suggested now that even that sum should no longer be paid. He thought there should be more fire alarms, and that the police, as in many provincial towns, should be part of the Brigade.

Mr. Thornton seconded the amendment. Though the personnel of the Brigade was very satisfactory, he did not think the appliances were, and he agreed that we had much to learn from America. He was satisfied that chemical appliances ought to be used.

Mr. Urquhart, Vice-Chairman of the Com- mittee, said the new escapes would be the most perfect instrument of the sort, not only in London, but in the world. He hoped they would approve the scheme, which was some- thing like a complete scheme for the protection of London from fire. In regard to chemical engines, the opinion seemed to be that the Brigade could do as well without them for small fires, and that for large fires they would be of little avail.

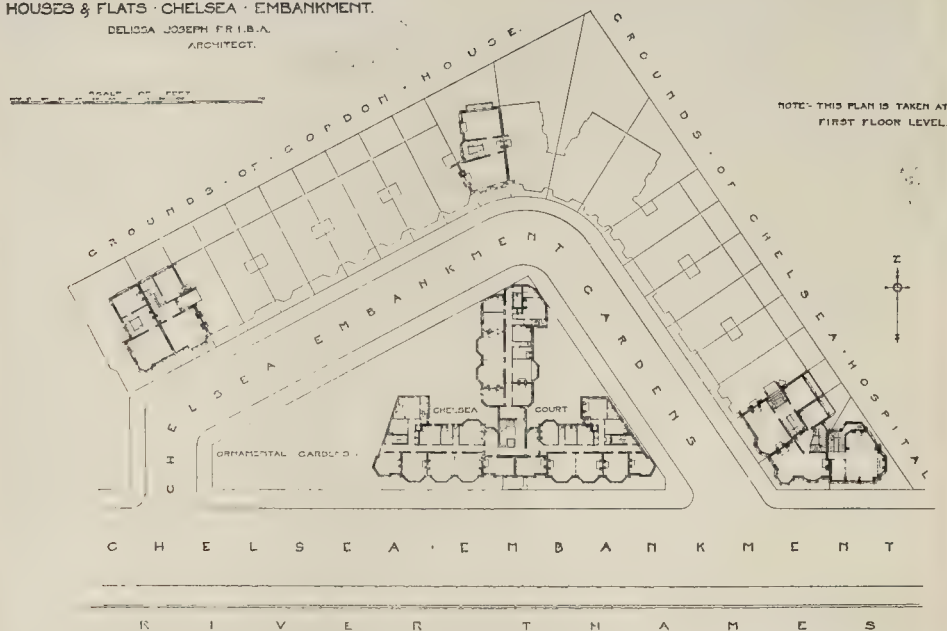
The debate was, after further discussion, adjourned.

Jobbing Work.—The same Committee also reported as follows:—

"The Council on April 28, 1896, resolved that the jobbing work required at fire brigade stations should be executed at our option by contractors or by the Works Department. Arrangements for insuring compliance with the Council's standing orders with respect to rates of wages and hours of labour in cases in which local tradesmen might be employed having been completed, the new arrange- ment came into effect on June 1, 1896. We recently instructed the Architect to report what had been the effect of the arrangement during the twelve months ended May 31, 1897. He now reports that during that period the total number of works which had been executed, and the cost of which had been ascertained, was 630, of which 437, estimated by him to cost 2,344*l.* 12*s.* 3*d.*, were done by the Works Department at an actual cost of 1,026*l.* 14*s.* 6*d.*, and that the remaining 193, estimated by him to cost 3,307*l.* 11*s.* 11*d.*, were executed by contractors at an actual cost of 3,141*l.* 4*s.* 2*d.* It will thus be seen that the works executed by the Works De- partment have cost 17 per cent. less than the Architect's estimate, whilst those done by contractors have cost 52 per cent. less than his estimate."

Elephant and Castle Estate, Walworth- road.—The Improvements Committee recom- mended, and it was agreed, that the estimate of 9,550*l.* submitted by the Finance Committee be approved, and that, subject to the Vestry of

HOUSES & FLATS - CHELSEA - EMBANKMENT.

DELISSA JOSEPH F.R.I.B.A.
ARCHITECT.

Newington agreeing to undertake the necessary paving works, the Improvements Committee be authorised to arrange for the acquisition of the land forming the northern and southern frontages of the Elephant and Castle Estate, and for the alteration of the tramway lines in connexion with the widening of the roads, as shown upon the plan approved by the Improvements Committee on January 21, 1898, and that, in the event of the owners being unwilling to sell the land at a reasonable sum, the Vestry of Newington be asked to acquire the property compulsorily under the powers conferred by the Act of 57 Geo. III, cap. 29 (Michael Angelo Taylor's Act), on behalf and at the cost of the Council.

After transacting other business the Council adjourned soon after seven o'clock.

Illustrations.

FLATS AND HOUSES, CHELSEA EMBANKMENT.

THESE flats and houses occupy the site of the Naval Exhibition of 1891, and have taken about three years in erection.

The first contract was for twenty-three houses, and the works were executed by Messrs. J. Allen & Sons, at a cost of 92,000l. The second contract was for the block containing eighteen sets of flats, and these were carried out by Mr. H. Lovatt, at a cost of 41,000l. The total outlay upon the whole operation thus amounted to about 133,000l. The block plan, published herewith, explains the method in which the land has been laid out so as to obtain the largest amount of frontages, and at the same time to secure to each house and flat an adequate view of the river.

Some difficult planning had to be overcome in the treatment of the three-angle houses; and what is believed to be a new departure has been employed in the general form of the plan of the flats, whereby three suites on each floor are served by a common stairway.

The architect for both flats and houses is Mr. Delissa Joseph.

DRAWINGS OF CLARE COLLEGE.

THE measured drawings of Clare College, as it is called on the drawings (its proper title is

Clare Hall), are by Mr. T. Tyrwhitt, and are the set for which the Institute silver medal and ten guineas was awarded last month.

Clare Hall is one of the most interesting buildings of the early English Renaissance, deriving additional effect from its charming situation. The view of it from the bridge behind King's forms one of the most pleasing bits of architectural effect to be seen in Cambridge. A complete set of elevations of the interior court and the principal external façade, with the plan, is therefore of some value as a record and for purposes of study.

The building was commenced in 1638, and the quadrangle appears to have been completed, in the desultory manner in which building was carried on in those days, in about fourteen years. As usual, there is no mention of an architect, and no record as to who even claimed to have made the design; only we know that John Westley was the builder, and Francis Wright the carpenter, and three or four other names are recorded as those of working masons, on daily wages.

The chapel, a portion of which is shown in Mr. Tyrwhitt's drawings, was more than a century later, having been commenced in 1763, from the design of Sir James Burrough, Master of Caius College, on whose death the next year it was put into the hands of James Essex.

Mr. Tyrwhitt, the author of the drawings, writes:—"It may be noticed on the plan that the dividing up of the college rooms, more especially at the south-east corner of the quad, is not as originally designed; the thick walls and fireplaces of course remain, but the partition walls seem to have been moved about from time to time. On the plan also the inconvenient arrangement of having no closets for the undergraduates within the building might be noticed, although this is a common arrangement both at Oxford and Cambridge. In elevation the Gothic character of the window jambs and mullions to the quadrangle and street façades are of interest, also their string courses and sills; mouldings of almost mediæval section often occur.

I hear from the master of the college that the balustrade to this portion is not original: it had probably a plain or battlemented parapet, and although the balustrade seems in keeping with the whole, yet in detail its mouldings are more advanced than the rest, as you may have noticed from the sheet of full-sized profiles. There are some grand wrought-iron gates, both at the entrance from the street and at the back

of the college, which I much regret I had not space to show. Internally, there are many details worth notice—the central staircases on north and south sides of quad, that in the master's lodge, the bookshelves in the library, the panelling in the combination room, &c."

DESIGN FOR A SMALL COUNTRY CHURCH.

THIS design, by Mr. Harbottle Reed, is the one to which the Council of the Institute of Architects awarded the Grissell Gold Medal for the present year. The following is Mr. Reed's statement of his aim in working out the design:—

"As the conditions of competition stipulated that the church must be constructed entirely of timber (with shingle roof) an endeavour was made to govern the design by the nature of the material suggested.

Even the stone basement upon which the ancient Norwegian wooden churches stand, and from which they derive a certain air of permanence, was inadmissible, as was the plaster work of our Cheshire examples.

This and the necessary avoidance of stone forms in construction and tracery inevitably tend to render it difficult to impart the appearance of durability which it is desirable that every church, however small, should possess; although this has been partially attained by keeping the timbers of good size.

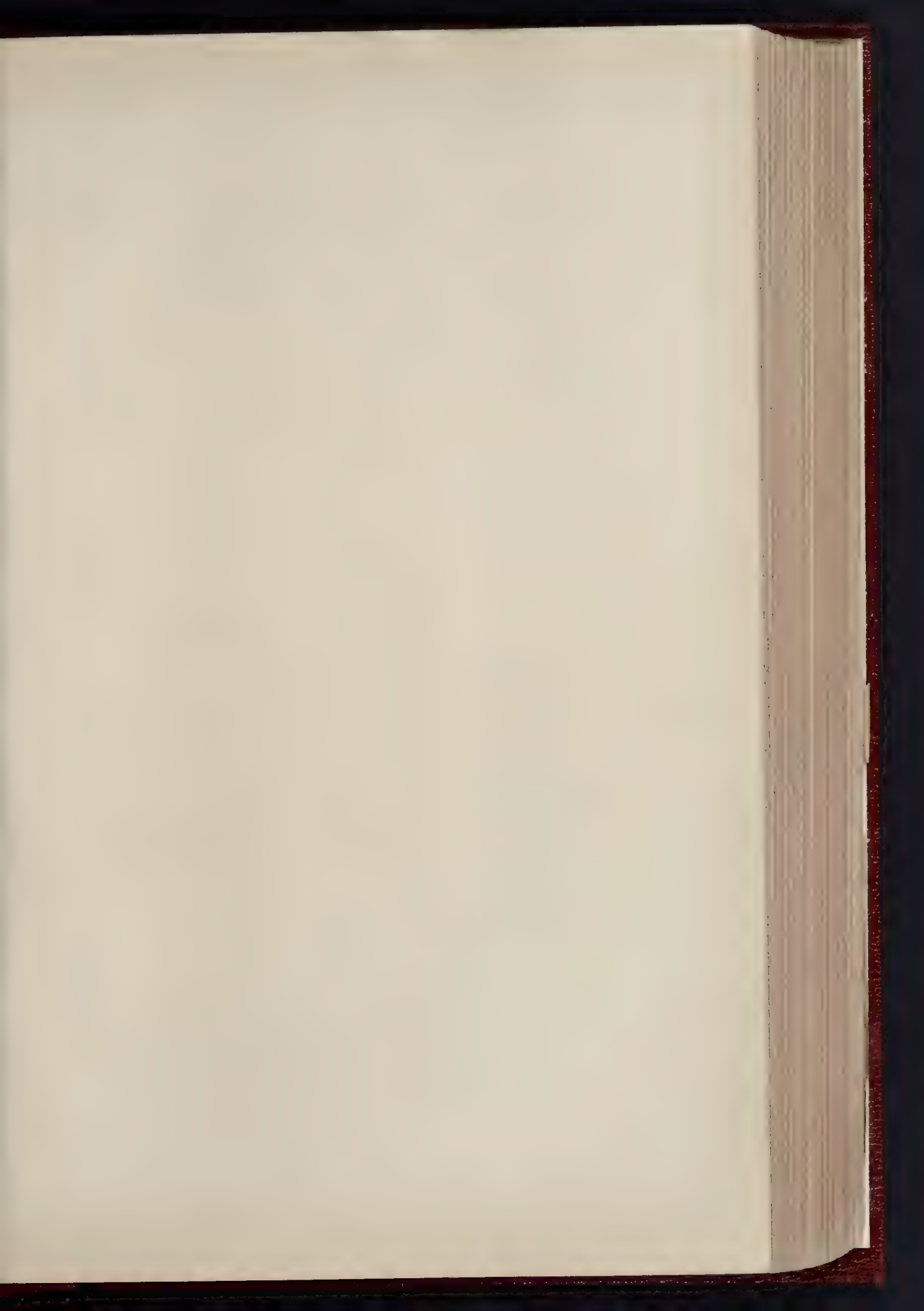
Ample room is afforded for the 200 sittings, and in addition to the usual choir seating a space is provided for an auxiliary choir or orchestra.

To give relief to the interior a range of panels under the cornice would be filled with decorative painting."

The competition for the Grissell Medal was a very good one this year, perhaps because the subject was such an attractive one; and we shall publish shortly two of the other designs submitted.

COMPETITIONS.

WESLEYAN CHAPEL, WESTON-SUPER-MARE. —In a limited competition for a new Wesleyan Chapel to be built at Weston-super-Mare, the designs of Mr. W. J. Morley, of Bradford, were accepted. The design is in the Decorated Gothic style, with tower and spire, and the building is to cost about 5,000l.

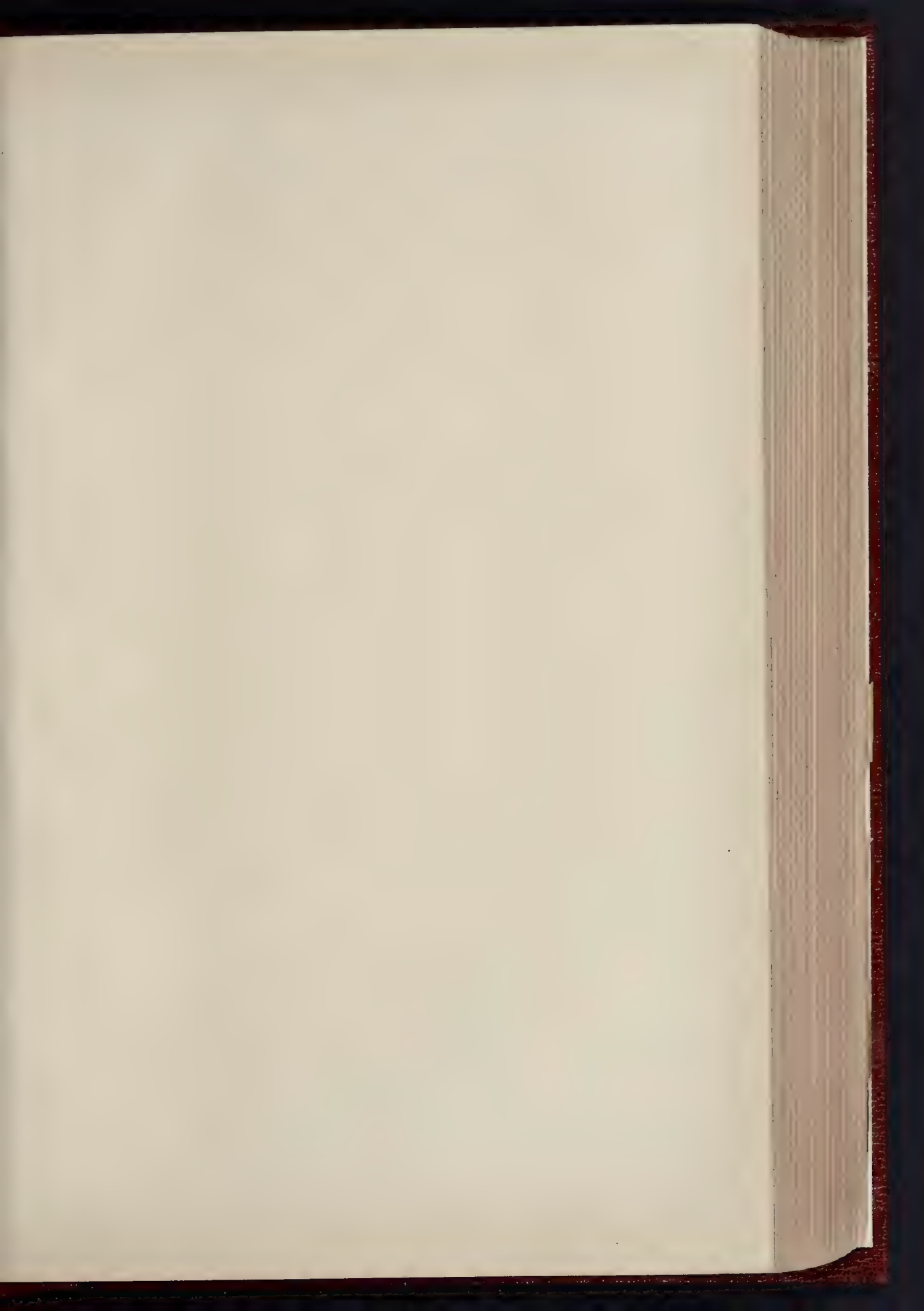




HOUSES AND FLATS, CHELSEA EMBANKMENT



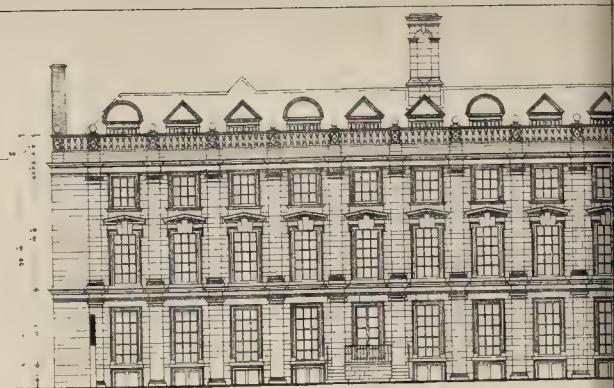
—MR. DELISSA JOSEPH, F.R.I.B.A., ARCHITECT.



CLARE COLLEGE
CAMBRIDGE


SCALE OF FEET

AS THE RIVER FRONT WAS DESIGNED
BY WILLIAM SOMERSET CRAWFORD, ESQ.
IT WAS BEGUN IN 1845. THE ARCHITECT
OF THE STREET FRONT IS UNKNOWN.



MASTER'S LODGE



SIDE OF CHAPEL




COLLEGE ROOMS

PORTER

CLARE COLLEGE
CAMBRIDGE

THE INTERIOR OF QUADRANGLE



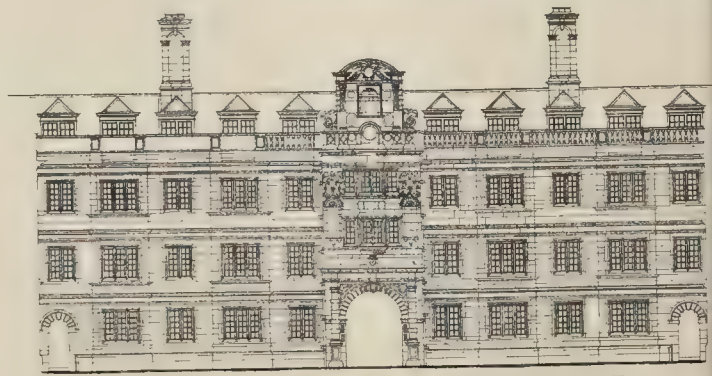
SCALE OF FEET

MEASURED AND DRAWN BY MR. T. TYRWHITT.



COLLEGE ROOMS

STUDYING ROOMS



COLLEGE ROOMS

PORTER

COLLEGE ROOMS

EAST SIDE



FRONT



FRONT



COLLEGE BUILDING

LETTER ROOM



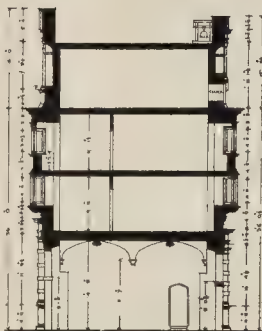
COLLEGE BUILDING

PROPERTY HOUSE

WEST SIDE

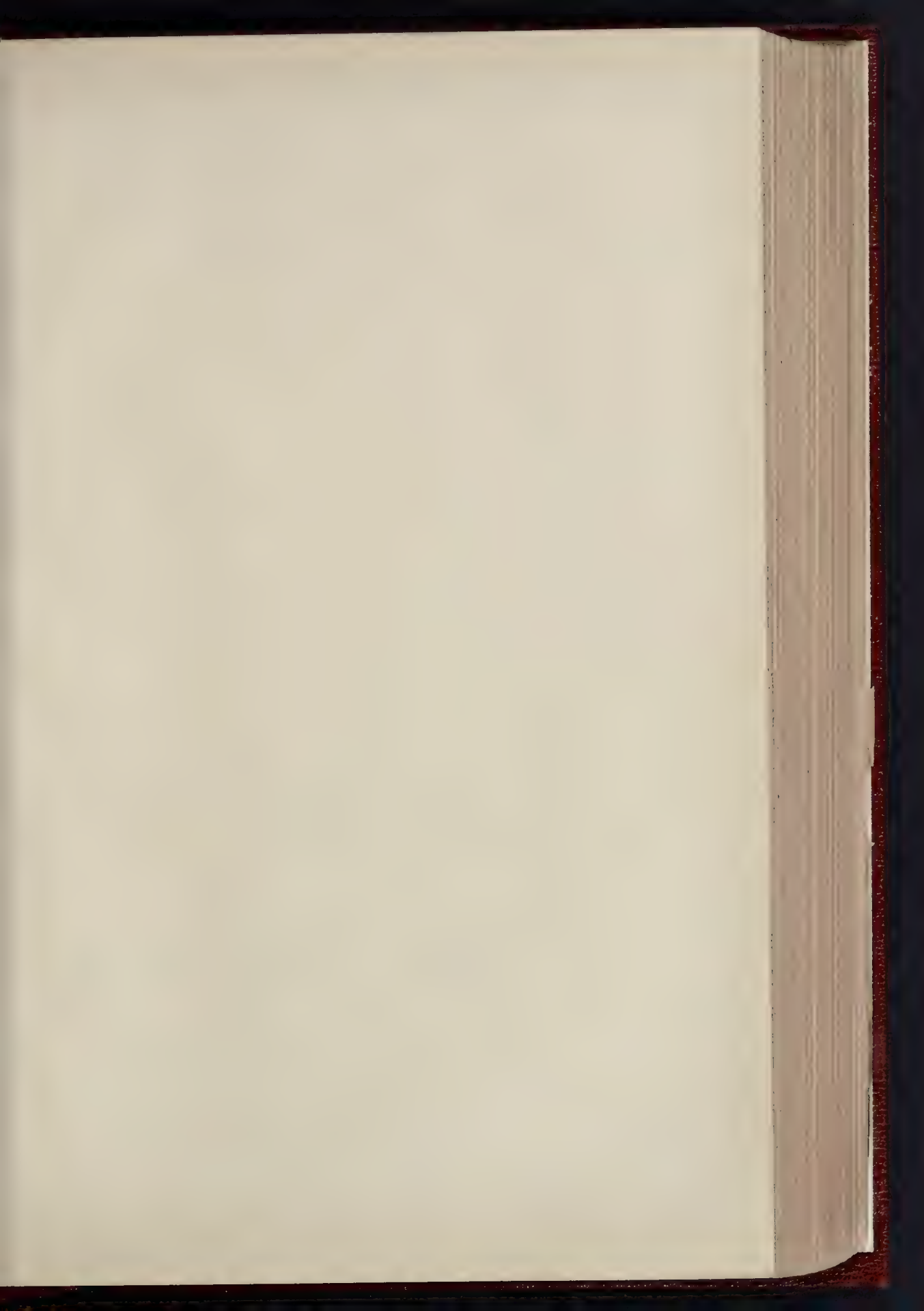


FRONT WALL OF GATEWAY

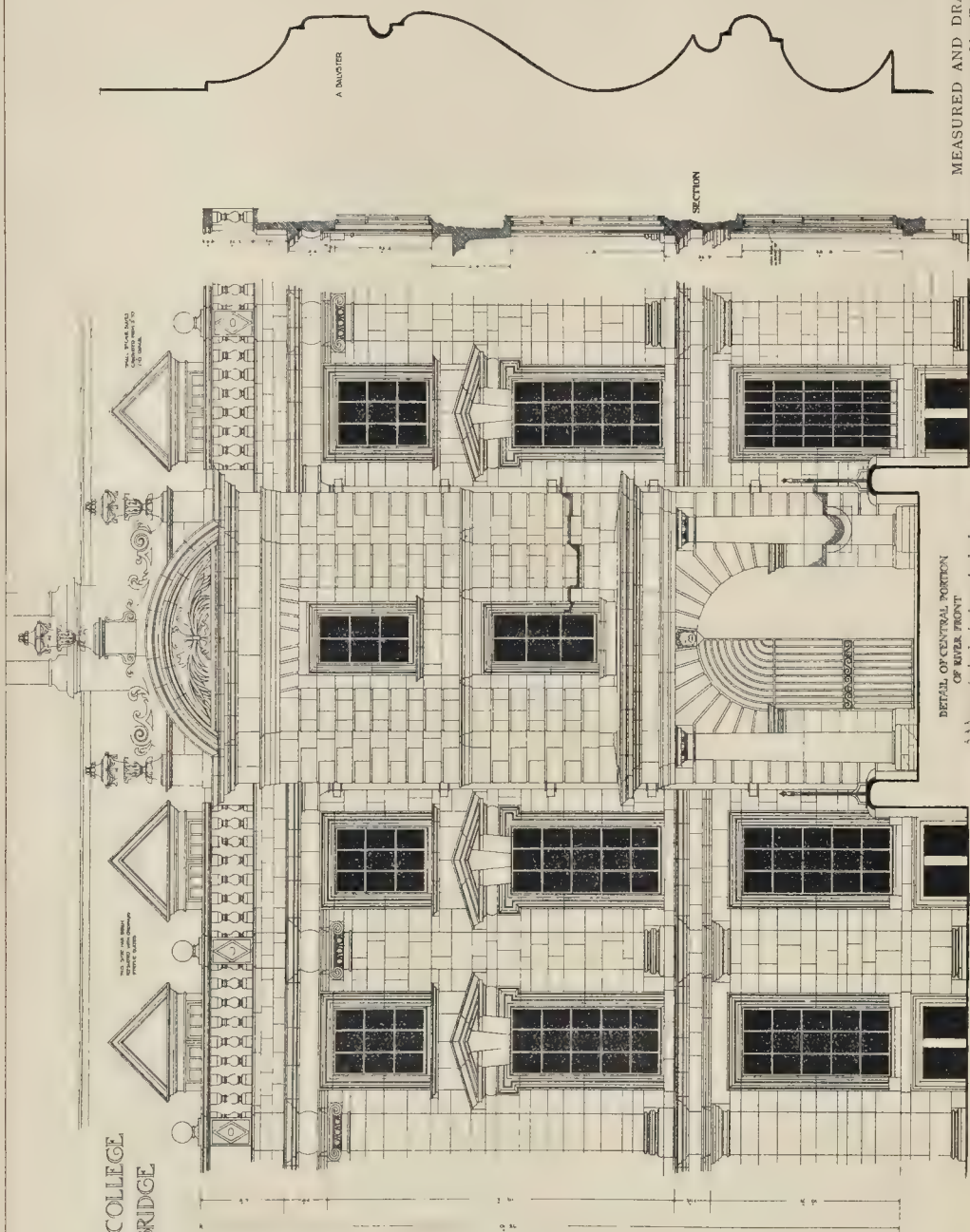


BLOCK SECTION OF GATEWAY

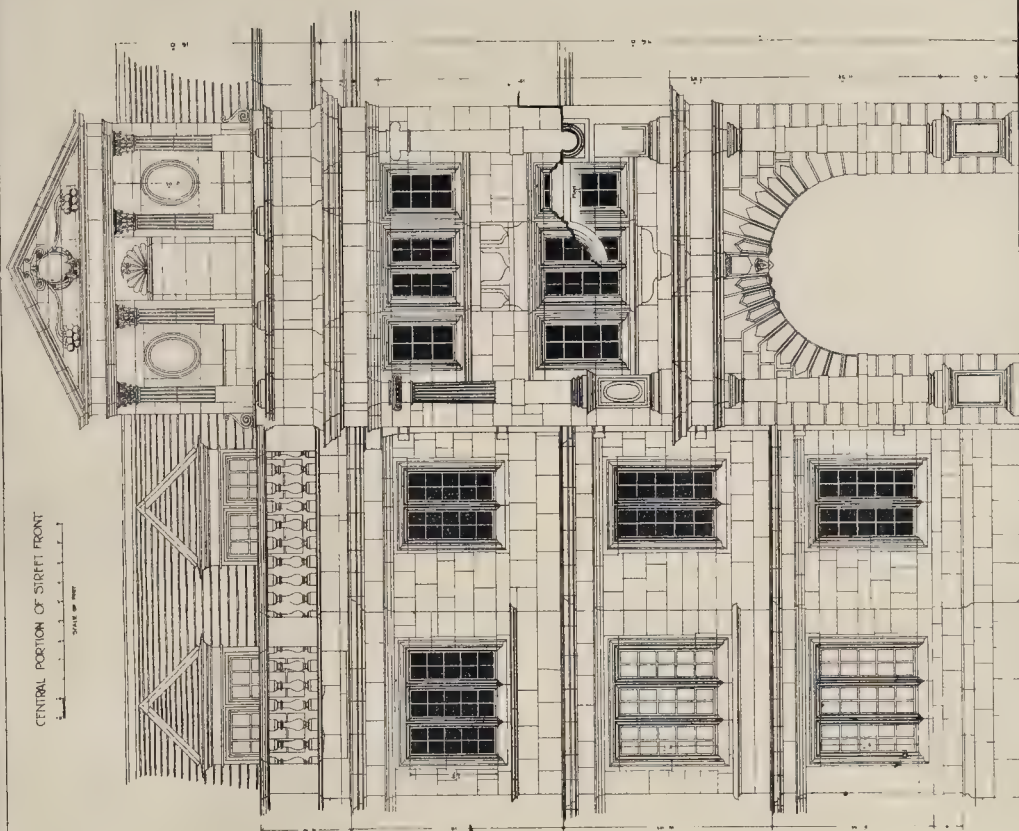
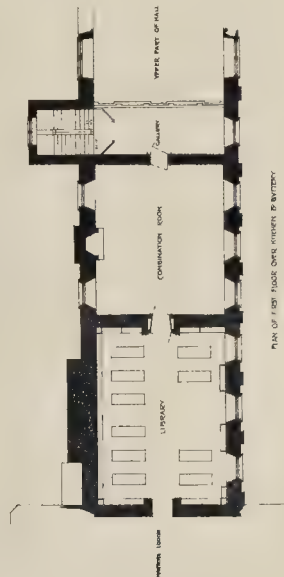
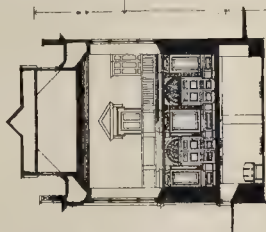
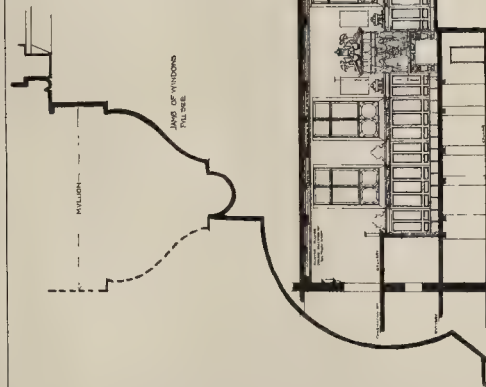
NOTE - THESE THREE DOORS ARE THE
GROSS PART OF THE CHAIRMAN'S AND
WIFE'S ROOM IN 1845. THE ROOMS ARE
NOT ILLUSTRATED HERE. WAS FURNISHED IN
1845 AND IS OF THE UNIVERSITY IN 1845.
THE CENTRAL GATEWAY OF WEST SIDE
WAS PROBABLY FIRST WITH REVERE FRONT 1845



CLARE COLLEGE
CAMBRIDGE



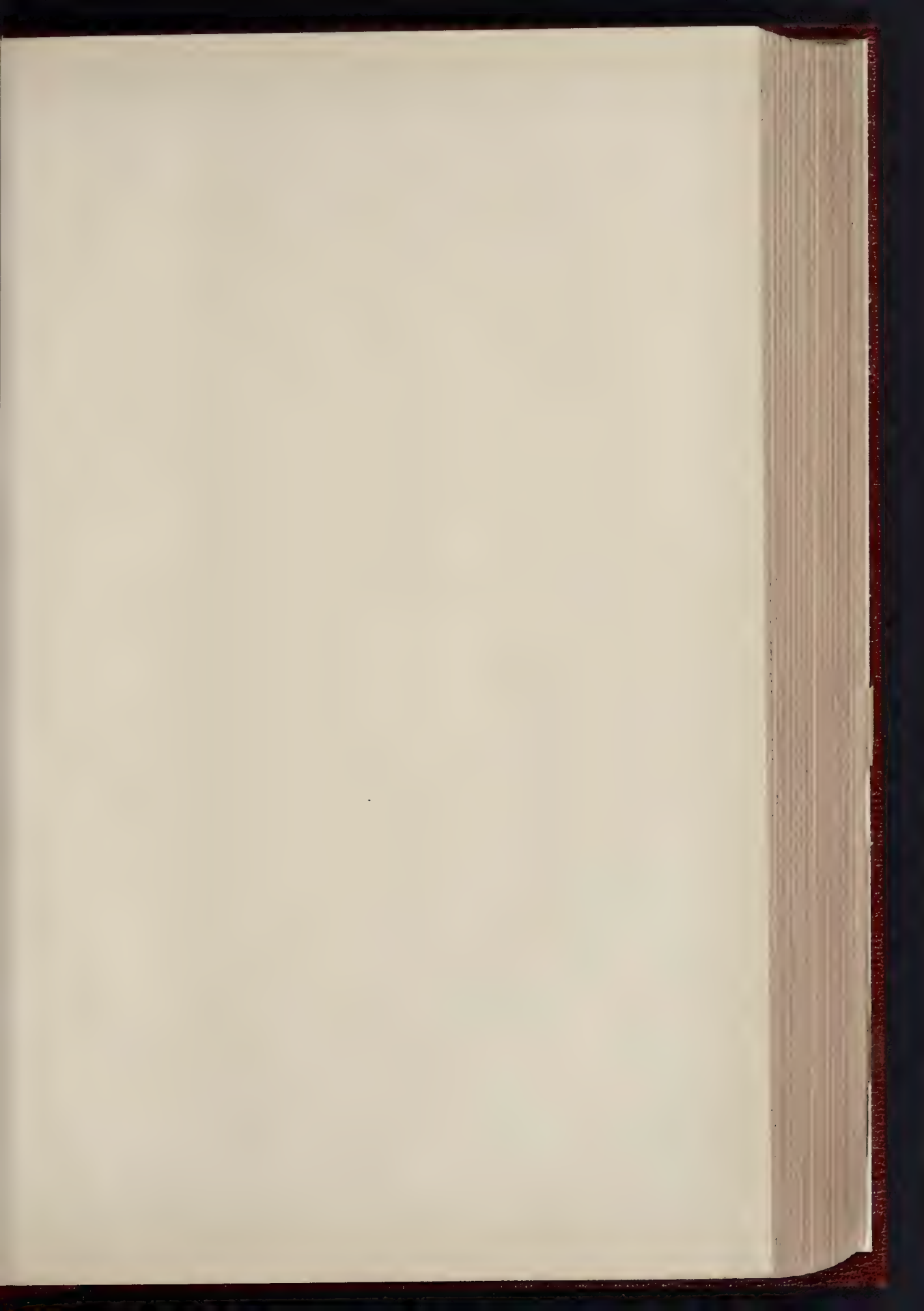
CLARE COLLEGE CAMBRIDGE



MEASURED AND DRAWN BY MR. T. TYRWHITT.

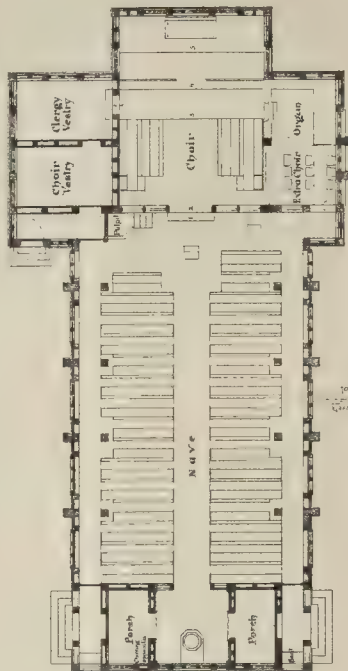
R.I.B.A. Medal, 1898.

PHOTOGRAPH BY SPARKS & CO. 433 EAST HANCOCK STREET, CLEVELAND, O.

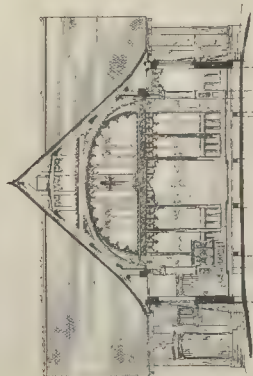




South Elevation.



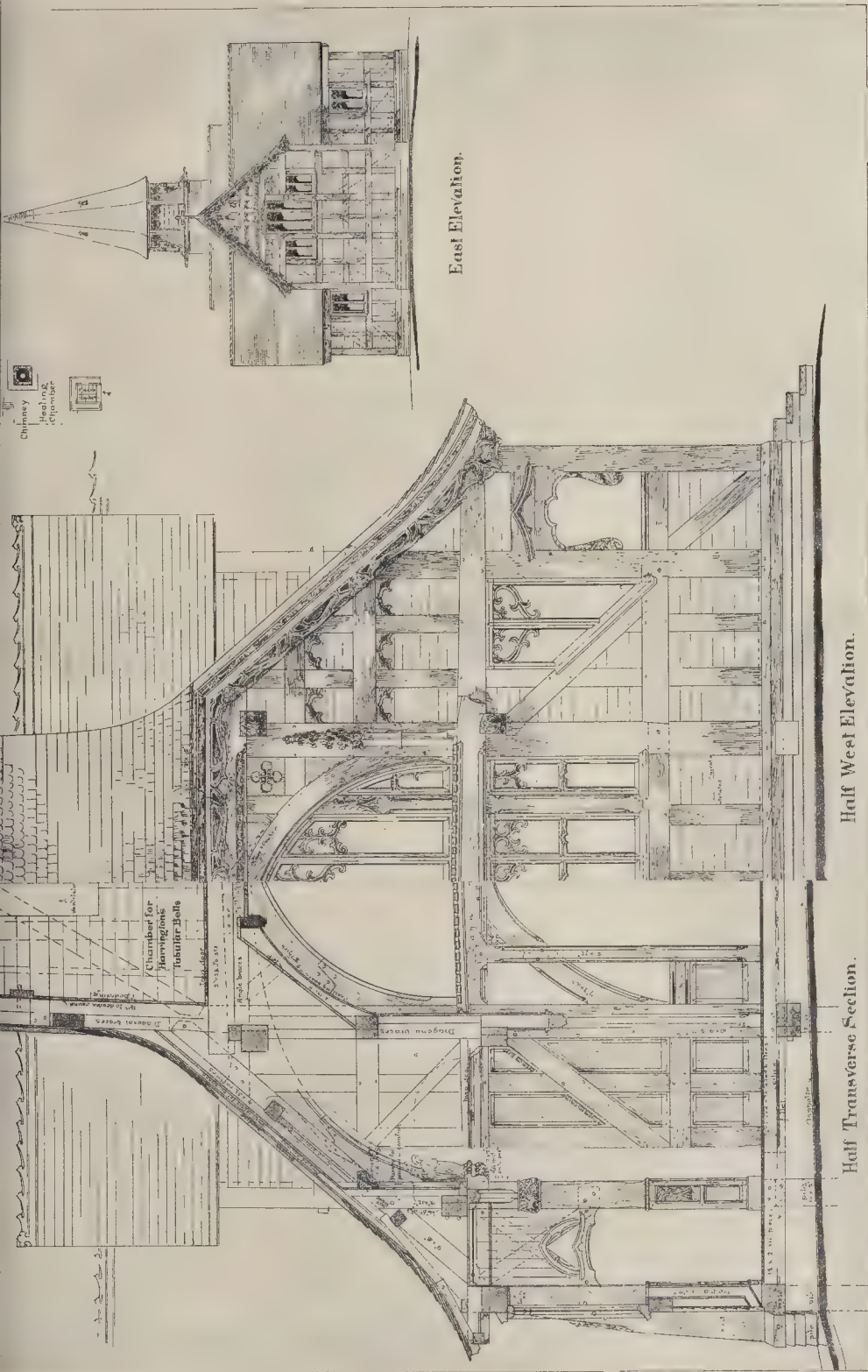
Plan.



Cross Section A.B.

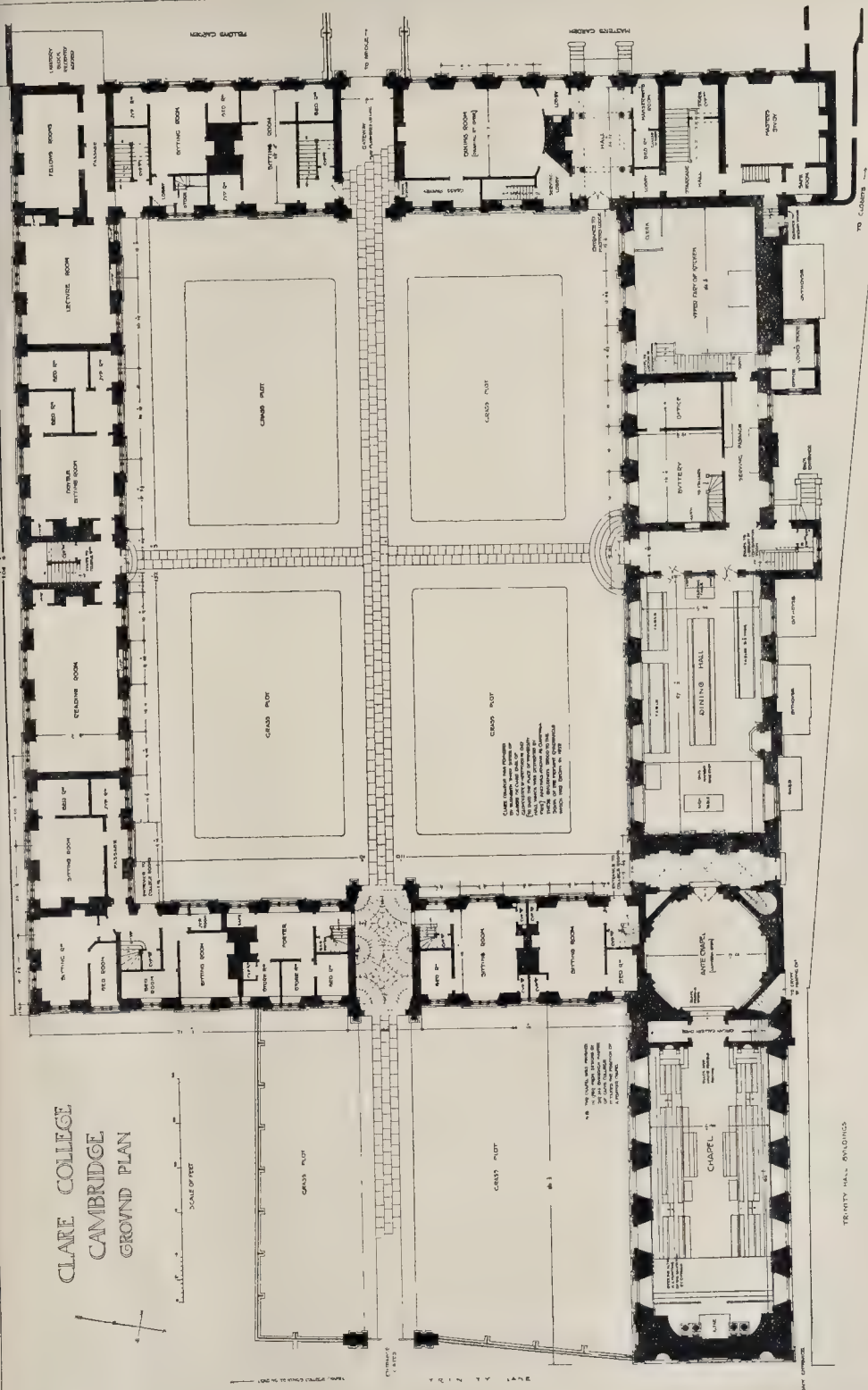
Accommodation :-

Nave	113	Sittings
Choir	18	"
People (chance)	0	"
or Orchestra	0	"
Total	200	



DESIGN FOR A SMALL COUNTRY CHURCH.—By MR. HARBOTTLE REED.

Grisell Medal, 1896.



Measured and Drawn by Mr. T. Tyrolhitt.

PROPERTY HAS A BONDING

BOOKS RECEIVED.

THE CATHEDRAL CHURCH OF LICHFIELD: By A. B. Clifton. (G. Bell & Sons.)
 THE CATHEDRAL CHURCH OF WINCHESTER: By P. W. Sergeant. (G. Bell & Sons.)
 THE GAS-ENGINEERS POCKET BOOK: By Henry Connor. (Crosby, Lockwood, & Son.)

Correspondence.

To the Editor of THE BUILDER.

THE ENGINEERING STRIKE.

SIR,—Now that this disastrous strike is at an end, although the effects will probably be felt for some considerable time, every one, I take it, in all trades, will be anxious to prevent a similar struggle occurring again. To do so, we ought, if possible, to find out the chief causes which lead to these strikes. One of these causes seems to be that the men, as a rule, only hear one side of the question. Their meetings are addressed solely by men of their own class, who have never had to manage a business; and who are not sufficiently educated to realise the conditions of international competition, under which modern business is carried on. The papers they read are equally one-sided. Would it not be possible to hold periodical meetings of masters and men, at which the masters could explain to them the ultimate effects on the national trade of such policy as deliberately working slowly, and reducing the number of apprentices, which, of course, means increasing the number of unskilled labourers, already too large. When we find that America, where wages are higher than in England, can deliver steel rails more cheaply than we can produce them here, it is evident that our so-called skilled mechanics are very inferior to other nations in the quantity of work they turn out; and if they continue in the same course we shall have no work to do. If the men could have this plainly explained to them by masters, instead of being carefully ignored, we might have less difficulty in future.

GUY M. NICHOLSON.

THE LONDON COUNTY COUNCIL AND COMPULSORY REGISTRATION OF LAND.

SIR,—The Report of the General Purposes Committee of the London County Council issued last week has been a revelation to many who assumed without inquiry that the Land Transfer Act, 1897, would cheapen and simplify the transfer of property. The Council deserves every credit for obtaining the views of bodies and classes interested before deciding on the proposal to experimentally adopt compulsory registration of title in the County of London. It was hardly foreseen, however, that the result would have shown such a decisive consensus of opinion against the proposal.

The Council received in all fifty-seven communications. Of this number only thirteen favour the application of the Act to London, whilst the number against amounts to forty-four. The full significance of these numbers can, however, only be realised when the character of the replies and the bodies sending them are considered.

The replies in favour are confined to twelve Vestries or local bodies and one individual. The forty-four replies against include twenty-one Vestries or local bodies, the Institute of Bankers, the Building Societies Association, the Ecclesiastical Commissioners, the Auctioneers' Institute, seven railway companies (amongst them the London and North-Western, the Midland, the Great Western, and the Great Central), and also eight building and land societies, including the Birkbeck and the British Land Societies, who sent in replies on their own initiative.

The reasons given for the respective decisions come to be almost entirely one-sided. Two only of the Vestries who favour the experiment give a reason for their decision; but the reasons given on the other side are many and various. It would make too great a demand on your space to set the arguments out at length, but the opponents of compulsion are almost unanimous in arguing that the proposed system would add seriously to the difficulty, expense, and delay of dealing with property, and that the County of London is not a suitable county for a doubtful experiment, having regard to the vast number of properties that would be affected and the value, complexity, and importance of the interests involved.

The only plea on which a claim to apply compulsion can be founded is that compulsion is called for by and in the interests of the public and of property owners. In the face of the replies sent in to the Council it is hardly conceivable that any member, Moderate or Progressive, would care to incur the responsibility of allowing the Act to come into operation. Londoners will watch with unusual interest the proceedings at the special meeting to be held on February 15. The vital importance of every member being in his place on that day will be understood when it is realised that the Act is so framed that if one-third of the members should be for any reason not be present the meeting cannot be

held, and in that case compulsory registration of title will take effect in London on July 1 next.
 J. S. RUBINSTEIN.
 5, Raymond-buildings, Gray's Inn, W.C.

A PROPERTY OWNER'S PARADISE.

SIR,—The village of New Southgate, though only six miles from King's Cross on the main line, is, from the builder's point of view, the most neglected round London, as there has been very little building going on there for the last twelve or fifteen years, never more than one or two houses being built at a time and not often that. Yet, in that time, the population has doubled, and the inhabitants are herded together in an alarming manner. Small cottages, "two up and down," are commanding 8s. and 9s. a week; three up and down 12s. to 14s. The rates are the lowest in the suburbs of London, being only 5s. 3d. in the £, and not likely ever to be more, on account of the proximity of the county asylum, which, while contributing largely to the rates, is no expense to the parish. The land is mostly freehold and cheap; being on the main line, carriage is light, and access is easy.

There is an abundance of employment in the neighbourhood, and in consequence of the facilities for getting to town it is a favourite residential suburb. The only want, and that is getting most acute, is more houses. It is no exaggeration to say that four or five hundred would find ready and good tenants.

A WOULD-BE TENANT.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—VI.

FOR the sake of illustration let us work out some examples of the application of the formulae we have investigated in the last two chapters. First: What would be the amount of deflection of a fir beam 15 ft. span, 6 in. by 9 in., with a central load of 38 cwt.?

Our formula is (Chap. IV.) $SD = \frac{WL^3}{BD^3}$

Here $W=38$ cwt. plus $\frac{1}{2}$ the weight of the beam.

The weight of the beam taken at 36 lbs. per foot cube is $15 \times 75 \times 5 \times 36 = 15 \times 75 \times 18 = 15 \times 135 = 202\frac{1}{2}$ lbs. say 2 cwt.

$\therefore W=38 + 2=40$ cwt. = 2 tons.

$L=15$, $C=0.5$, $B=6$, $D=9$.

$\therefore SD = \frac{2 \times 15^3 \times 0.5 \times 5}{6 \times 6 \times 9 \times 9}$

$= \frac{5 \times 5 \times 5}{2 \times 9 \times 9}$
 $= \frac{125}{162} = 0.77$, say $\frac{3}{4}$ in.

Referring again to Chapter IV, the student will remember that the greatest permissible deflection for a span of 15 ft. according to

Tredgold is $\frac{15^3}{480} = \frac{180}{480}$ in. = $\frac{1}{8}$ in. The deflection we have found for our beam above is, therefore, one which would be noticeable, and possibly might cause plastering to crack, for the permissible deflection alluded to by Tredgold is that which is not very evident to the eye, and not likely to cause cracking of the plastering.

If the object we have in view is to ascertain the weight that can be carried without an undue amount of deflection, the question would be put in somewhat of this form: What evenly distributed load can be carried by a fir beam 8 in. by 12 in. over a span 16 ft. without causing a deflection of more than $\frac{1}{16}$ of the span?

In this case we have to transpose our formula thus:—

$$W = \frac{SD \times B \times D^3}{L^3 \times C}$$

Here $SD = \frac{16 \times 12}{480} = 0.4$ in., $B=8$, $D=12$, $L=16$, $C=0.5$

$$\therefore W = \frac{4 \times 8 \times 12 \times 12 \times 12}{16 \times 16 \times 16 \times 0.5} = \frac{3 \times 3 \times 3}{2 \times 5} = \frac{27}{10} = 2.7 \text{ tons} = 34 \text{ cwt.}$$

Now W contains $\frac{1}{2}$ the weight of the beam; taking this as before at 36 lbs. per ft. cube, we have:—

Weight of beam = $16 \times \frac{8}{12} \times 1 \times 36 = 16 \times 24 = 384$ lbs. = say $3\frac{1}{2}$ cwt. and $\frac{1}{2} \times 3\frac{1}{2} = 2\frac{1}{4}$ = say $2\frac{1}{2}$ cwt.

\therefore Permissible central load on beam = $54 - 2\frac{1}{2} = 51\frac{1}{2}$ cwt. But the distributed load which will produce the same effect is (Chap. IV.) $\frac{1}{2}$ of this, since the deflection from a distributed load is $\frac{1}{8}$ of that from a central load.

\therefore Permissible distributed load = $\frac{51\frac{1}{2}}{2} \times \frac{1}{2} = 82\frac{1}{2}$ cwt.

If it is desired to find the scantling of a beam to give a certain permissible deflection with a given load over a given span, the operation is not quite so simple, as the weight of the beam, five-eighths of which is taken as its equivalent central deflecting load, depends upon the unknown scantling. In this case, therefore, the student should first of all find the necessary scantling for the required deflection with the given load, and then, having thus found an approximation to the beam required, take the weight of this as the weight of the beam required, and add five-eighths of it to the central load, or the whole of it to the distributed load actually carried by the beam, and then from this work out the scantling required. This will be very nearly, though not exactly, correct, the amount of error being that due to the difference in weight of the beam as approximately found and as required.

If the load is neither central nor distributed, but applied at some point other than the centre, the formula for deflection may be still employed, with the following modification, for the actual span: Multiply the product of the distances of the load from each support by 4, and divide by the clear actual span. Then take this quotient as the equivalent span in the formula. For example: What is the deflection in a fir beam, 15 ft. span, 6 in. by 9 in., with a load of 40 cwt. 5 ft. from one end?

Our formula is $SD = \frac{WL^3}{BD^3}$

Here $W=2$ tons, $C=0.5$, $B=6$, $D=9$, and

$$L = \frac{5 \times 10 \times 4}{15} = \frac{40}{3}$$

$$\therefore SD = \frac{2 \times \left(\frac{40}{3}\right)^3 \times 0.5}{6 \times 6 \times 9 \times 9}$$

$$= \frac{40 \times 40 \times 40}{6 \times 9 \times 9 \times 3 \times 3 \times 3} = \frac{32,000}{50,49} = \text{say } \frac{1}{2} \text{ in.}$$

This does not take into account the deflection due to the weight of the beam itself. This can be found separately, taking five-eighths of the weight as the equivalent central load, and then adding the deflection from this to that already found as produced by the load on the beam.

In dealing with the formulae for the strength of a timber beam and an iron beam we considered only the cases in which the load on the beam was either central or evenly distributed, but there may, of course, be instances in which the load is neither one nor the other, and as we have considered such cases as affecting deflection, so we ought to deal with them as regards breaking stress. The best method of dealing with such cases, particularly in the case of iron beams, is by an application of the theory of moments, but as we must, for the present, assume that the student is not conversant with this theory, we will give a rule which will enable the student to make use of the formulae with which he has already become acquainted. To find the amount of the central load on a beam which shall be equal in its effect to that of one or more loads at irregular distances from the supports, multiply each load by its distance from either support, and this product by the distance from the other support; add these products for the various loads, and divide by the square of half the span of the beam.

For example: What is the central load equivalent to two loads, one of 5 tons 4 ft. from one end, the other of 6 tons 5 ft. from the other end of a beam 16 ft. span.

$$\begin{aligned} \text{Central load} &= \frac{(5 \times 4 \times 12) + (6 \times 5 \times 11)}{8 \times 8} \\ &= \frac{240 + 330}{64} = \frac{570}{64} = 8.9 \text{ tons.} \end{aligned}$$

For the deflection of iron beams the following will be found a convenient formula for I or channel beams under any load less than the crippling load, for beams of good wrought iron do not break under a gradually applied load till after they have bent so much as to be useless.

$D = \frac{W \times L^3}{w \times d^3 \times C}$ where D is the deflection

NEW BATHS, DEPTFORD.—The Deptford Baths in New Cross-road are now approaching completion, and are shortly to be opened to the public. The architect is Mr. Dinwiddy, of Greenwich. The feature of the building is the first-class swimming bath, with a water area of 110 ft. by 35 ft., surrounded by a gallery for spectators. There is a second-class swimming bath of somewhat smaller dimensions. There are sixty-nine private baths in four different departments, divided into first and second-class, for men and women. A public wash-house and laundry (containing twenty-three separate washing cubicles), together with a smaller and separate establishment laundry, are planned at the rear. The total contract sum, including the engines, electric lighting, and well plant, is 37,492l. The building contract has been carried out by Mr. Holloway, of Deptford; the engineering work by Messrs. Moorwood, Sons, & Co., of Sheffield; the well contract by Messrs. Tilley & Sons; and the electric light installation by Messrs. Joel & Co.

BUILDING OPERATIONS IN EDINBURGH.—The Edinburgh Dean of Guild Court sat on the 27th ult., when there were twenty-five applications for warrants, of which thirteen were granted. The Chalmers Hospital trustees were authorised to make an addition to the south of the hospital, providing on the ground floor a servants' bed-room and store, and on the principal floor a waiting and dressing-room for the out-patient department. Interim warrant was granted to the North British Railway Company to make certain alterations, mostly of an internal nature, at the Waterloo Hotel, which the company has purchased for the purpose of offices. **BIBLE CHRISTIAN CHAPEL, NORTH-TAWTON, DEVONSHIRE.**—This building, which is situated in Barton-lane, has just been opened. It is Gothic in style. The chapel is 28 ft. long and 24 ft. wide. The work of reconstruction has been carried out according to the plans of Mr. Halls, architect, of Bolton, and the builders were Messrs. S. Ellis & Son, of North-tawton.

PARISH ROOM, BARNWOOD, GLOUCESTERSHIRE.—The formal opening of the Barnwood Parish Room took place on the 28th ult. The building consists of a reading-room, 18 ft. wide by 28 ft. 6 in. long, with archways opening therefrom into two reading-bays on the north side. Each of these bays measures about 9 ft. by 6 ft., and an open-timber entrance porch is placed at the north-west side of the building. The walls are faced with pressed bricks, the upper part of the gables being relieved with timber framing. The roofs are covered with Broseley tiles. The buildings have been erected by Mr. John Cullis, Gloucester, from the designs and under the superintendence of Mr. Walter E. Wood, architect, Gloucester. The gas lighting has been put in by Messrs. Heaven & Sons, and the carving is the work of Mr. H. Frith.

ROYAL INSTITUTION BUILDINGS, EDINBURGH.—Operations are at present in progress for the reconstruction of the north-west corner of the Royal Institution buildings at the foot of the Mound. It appears that the piles on which the building stands have given way to some extent at this part, and have thrown the projecting corner, with its Ionic capitals and architrave, about three inches off the straight. The wall was also cracked. The whole of the corner will be taken down to the foundations, the piles renewed, and the portion affected read on again upon a more solid foundation. The north-east corner is also affected, but only to a slight extent, and the same drastic measures will not have to be taken in regard to it. The work is being carried out under the supervision of Mr. Rowand Anderson, the architect to the Board of Manufacturers.—*Scotsman.*

PUBLIC LIBRARY, HOXTON.—The new public library for Hoxton will not be opened until March 23, when the ceremony will be performed by Sir John Lubbock. The new building is a terra-cotta faced structure in Pitfield-street. Mr. H. T. Hare is the architect, and Messrs. Dearing & Son are the builders.

HOUSES FOR ARTISANS, GOSPORT.—The Gosport District Council has given instructions to their Surveyor (Mr. H. Frost) to prepare a second set of plans for houses for artisans to be let at a rental of 4s. per week.

THE MUIR HALL OF RESIDENCE, EDINBURGH.—This building, which has been provided for women students attending the Edinburgh University, has just been opened. The alterations required to adapt the building to its new use have been somewhat extensive, and include the addition of two new stories and the entire remodelling of the interior. On the upper floors sleeping accommodation is provided for twenty-three students and the lady superintendent, while the ground floor is given up to a large dining hall to the back, and a drawing-room to the front. The kitchen and servants' bedrooms are placed in the basement. The architects are Messrs. Dunn & Findlay.

SANITARY AND ENGINEERING NEWS.

PLUMBERS, PLUMBING, AND PUBLIC HEALTH.—On the 28th ult., Dr. Mansel-Howe delivered a lecture on this subject at the Town Hall, Maidstone, the Mayor of Maidstone presiding. The lecturer said much of the plumbing done to-day was not done by properly trained plumbers, with

the result that much of the work was neither efficient nor reliable, and, unfortunately, exposed the inmates of many homes to disease which might and could be averted. Referring to the matter of sewer gas, he affirmed that much sickness was traced to this finding its way into our dwellings; and stated that quite recently Professor Corfield and Dr. Payne had signified their belief in its powers of spreading typhoid. Dr. Farquharson, M.P., had said: "We all know that the modern system of drainage, if not carried out perfectly, is simply an elaborate machine for introducing disease into our homes." And Dr. Shirley Murphy had pointed out that the recent outbreak in Shorehedge was probably due to insulation of sewage matter into a defective water main. He advocated the soil pipe being kept uniformly outside the house, and that both it and a separate relief pipe from the service drain should be carried to a point above the level of the highest portion of the house-roof, not too near to the chimneys. That all inside waste-water pipes should constitute a system apart, and never communicate with the soil pipe or service drain, but made to discharge over an outside and properly-trapped gully. Similarly, all outside rain-water pipes should empty into outside gully traps, and never be connected with the soil pipe for the purpose of emptying their contents, and never with the service drain, with the object of serving as relief pipes. He advocated also efficient classes, in connexion with technical institutes, for the better education and training of the rising generation of plumbers, and expressed the hope that Parliament would shortly place the registration of plumbers under statutory recognition, so that when sanitary work had to be done it might be undertaken by competent and responsible workmen. The lecture was illustrated with lantern slides, the subjects being for the most part examples taken from Dr. Vacher's work on "Plumbing Defects."

PUBLIC WORKS, BARNWOOD.—Herbert H. Law, C.E., held a public inquiry at the Gas and Water Offices, Barry Docks, recently, into applications made to the Local Government Board for power to obtain the following loans:—7,950l. for new works of water supply (including new mains, 1,750l. for new pumping-engine, and addition to the existing building), 350l. for enclosing and planting the land on Cardiff-road, 1,000l. for private improvements, 1,300l. for construction of new roads, and 500l. portion of cost of construction of bridge over the railway at Palmerstown. Mr. J. C. Fardoe, surveyor; Mr. F. M. Harris, gas and water manager; and engineer; Mr. E. W. Waite, water engineer; and others, attended the inquiry.

SEWERAGE SCHEME, CHESTER.—Mr. H. P. Boulnois recently held a Local Government Board inquiry at the Board-room, Chester, upon the proposal of the Chester Urban District Council to borrow 2,300l. for the completion of their sewage scheme. Mr. G. D. Bland, the Surveyor of the Council, described the existing sewage arrangements and the proposed works.

SLUDGE AND DUST DESTROYER, LEYTON.—A public inspection of the sewage sludge and refuse destructor which has been erected by the Leyton Urban District Council, was made on the 27th ult. This destructor, which was constructed by Messrs. Beaman & Deas, has now been in constant use for over a year, and has given very satisfactory results. The sewage sludge, before being charged into the destructor, is freed from moisture as far as is conveniently possible by mechanical means, while the refuse is consumed just as it is collected from the streets and houses. Under these conditions over 10,000 tons, two-thirds being refuse and the other third being fuel, were disposed of last year in four cells without the assistance of any other kind of fuel. In the process of combustion more than enough heat is generated to keep two 60-horse power Babcock & Wilcox water-tube boilers in full steam, and from these are driven, not only the pumping and pressing machinery at the sewage works, but also the fans which maintain a forced draught in the destructor cells, together with subsidiary machinery and dynamos to provide electric light for the whole of the works. All that leaves the chimney is a moderate quantity of pale brown smoke, while the incombustible residue is a hard clinker. The destructor furnaces are built in pairs, of which there are four, and each has an inclined hearth leading from the tipping platform, 8 ft. 9 in. in height, to a horizontal fire-grate. Beyond the grate is a fire-bridge, the space behind the bridge forming what is known as the combustion chamber, which is common to both furnaces. A reverberatory arch stretches over the chamber, fire-grate, and hearth, from the other three sides, and is hermetically sealed, and forced draught let into it by means of a fan. The whole of the sewage works and destructor buildings were carried out from the designs and under the superintendence of Mr. W. Dawson, the Surveyor.

THE BLACKWALL TUNNEL.—The Chief Engineer to the London County Council has issued a final certificate of the completion of the Blackwall Tunnel works carried out by Messrs. S. Pearson & Son. The tender from the contractors, as accepted by the Council on November 3, 1891, amounted to 871,000l. To this was subsequently added the amount of their contract for forming the raised approach roads, 8,952l., making the total contract price 879,952l. The total sum included 50,000l. provision money, to be used as might be necessary in providing for extras incidental to the work in-

cluded in the contract, such as engine and boiler houses for electric lighting, staircases in shafts, electric lighting plant, &c. All the work has been carried out as well as certain extra works which were not contemplated at the time the contract was let, and which have been ordered or sanctioned during the progress of the work. The final measurement, when all provisions are made for extras and deductions on what may be called the measured bills of quantities, amounts to 830,294l. The cost of the work, as well as the cost of the contract work as originally contemplated. The value of the work for which the provision money, was intended under the original contract was 20,277l. and the value of the extra works not contemplated under the original contract, but which have been sanctioned by the Council during the progress of the works, was 18,995l., making a total expenditure of 869,476l. There is, therefore, a balance of 10,476l. available for electric plant, wiring, &c., to the credit of the Council on the total contract sum. The Engineer has not been able at present to issue a final certificate to the electric lighting contractors, but the sum of 18,000l. voted by the Council for the purpose will not, the Engineer believes, be exceeded under the contract, and the smaller ones in connexion with the work. Adding this 18,000l. to the 869,476l., the value of the work done by Messrs. Pearson & Son, there is a grand total for all works connected with the construction of the tunnel of 887,476l. This, it will be seen, exceeds only by a little over 7,500l., by the amount of nearly 20,000l. added under the original contract, and the Council has obtained, in addition to the works contemplated when the contract was let, the extra works as before mentioned.

DRAINAGE AND WATER-SCHEMES, FARINGDON.—Colonel W. R. Slacke, R.E., one of the inspectors of the Local Government Board, held a public inquiry at the Savings Bank, Faringdon, on the 21st ult. into the application of the Rural District Council for the constitution of a special drainage district, to comprise a part of the parish of Great Faringdon, and for sanction to borrow 4,000l. for works of water supply for such drainage district. Mr. George Winslip, C.E., of Abingdon, the Engineer to the Council, produced the plans, and estimates of the water scheme, and described the various strata in the district, and the depth of each through which a shaft-hole had been sunk, and said that judging from gaugings made during the execution of the works and the period of experimental pumping, and by the rapid rise of the water after pumping had ceased, 60,000 gals. per day would be the minimum yield; equal to 20 gals. per head per day of the population. The water had to be lifted 80 ft., the velocity through the rising main was 1.38 ft. per second. The motive power would be by either a wind engine or an oil engine. The reservoir, in two compartments, would hold 180,000 gals. The distributing mains varied from 6 in. diam. to 3 in.

RESERVOIR, CLYDEBANK.—A start has been made with the construction of a new reservoir at Green-side, on the Kilpatrick Hills, for the Dunthorpe and Dalmuir special water district. This step was rendered necessary by the rapid growth of the district, which includes the burgh of Clydebank, which town now contains a population of nearly 20,000 inhabitants. The work is expected to last for two or three years, and the cost will be between 30,000l. and 40,000l. The filters are situated near the policies of Cochno. The engineer for the scheme is Mr. W. R. Copland, C.E., Glasgow.

PROPOSED NEW BRIDGE AT PENARTH.—The District Council office, Penarth, Mr. Henry H. Law, the Local Government Engineer, attended recently to take evidence in support of an application to borrow the sum of 1,500l. for the purpose of erecting a bridge over the Taff Vale Railway so as to connect the West Cottage district with the business portion of the town. It is also proposed to close the present level crossing from Windsor-road and remove the foot-bridge at present standing there lower down towards Cogan. Mr. E. J. Evans (Surveyor) described the new bridge which it is proposed to erect. The bridge, he said, would provide a carriage-way 24 ft. in width, and a footway 6 ft. in width, the whole to be carried on steel girders.

FOREIGN.

FRANCE.—The new Committee on "Vieux Paris" has arranged that its work shall be divided between three sub-committees. The first will draw up the inventory of ancient monuments and of the artistic treasures of Paris. This Committee is principally composed of literary men and archaeologists. The second Committee, almost entirely composed of architects, will occupy itself especially about the conduct of excavations and other such works.—The third of which M. Detaille is the President is to inventory the works discovered, or inventoried by the other two Committees.—M. Jean Paul Laurens has been elected President of the Société des Artistes Français, in place of M. Bonnat, who had been elected but declines to serve further. M. Bonnat had held the office for three years.—The jury of the competition opened by the "New York" Insurance Company for offices in the Boulevard des Italiens and in Rue Le Peletier have awarded the first premium to MM. Morin Gonsaux and Le Cardonnell; the second to MM. J. Bernard

E. Robert; and the third to MM. A. Maistrasse and Marcel Berger.—The fifth exhibition of the Peintres Orientalistes was opened on February 1 in the Durand Relat Gallery, and includes a collection of the works of the deceased painter Leon Belly.—On Sunday last the Palais des Beaux Arts at Lille was opened, having been closed for some time for repairs. M. Denby, painter, who has directed the work, has been appointed curator.—M. Allouard the sculptor, has just completed the model for the monument to be erected to Troyon, at Sévres.—The Society which exploits the Eiffel Tower has been authorised by the Municipal Council of Paris to widen the gallery on the second stage by 2 metres, and the system of lifts is to be improved. It was certainly time.

SYDNEY.—The report of the Public Works Committee, which inquired into the expediency of erecting new Houses of Parliament for the colony, and which has been laid upon the table of the Legislative Assembly, contains some interesting information. Taking the present building as a whole, and comparing it with the design according to the new design, it is found that the former contains in all 102 rooms, with an area of 34,886 ft., and that in the proposed new building the rooms would be increased in number to 188, and the area to 109,763 ft.; the difference between the present and the proposed building being sixty-six rooms and 74,877 ft. area. The estimated cost of the proposed new building is £53,484, or 1s. 8d. per cube foot for the building up to the general roof level, 60 ft. from the basement, and 3s. per cube foot for those portions above that height. It was proposed to carry out the work gradually, about 100,000, to be expended annually, and the building to be completed within six years. The dome would be the last thing dealt with, as it is intended to allow the lower portions of the building, including the base of the dome, to stand for three years before the dome itself was erected. The possibility of improving the present building at a reasonable cost also engaged the attention of the committee and they recommended the adoption of a scheme prepared, at their instance, by the Government architect, providing for alterations to the present Parliamentary Buildings at a cost not exceeding 15,000.—*Sydney Morning Herald.*

STAINED GLASS AND DECORATION.

ST. MARGARET'S CHURCH, BROXTON.—A four-light west window has just been dedicated in this church by the Bishop of Beverley. In each light is a figure of an archangel standing under an elaborate canopy, all with their respective emblems; while underneath are representations of the different works with which each archangel is associated in Holy Scripture. The window has been carried out in the style of the fifteenth century, and was designed and executed by Messrs. Percy Bacon & Brothers.

HOLY TRINITY CHURCH, ROEHAMPTON.—The seven baptistry windows in this church have just been filled with stained glass. The subjects shown are the seven corporal works of mercy. "Clothing the naked" being in the centre. Each window has an angel with scroll representing the seven gifts of the Holy Ghost. The five single lights in the Lady Chapel have also been filled with stained glass; the centre light is a representation of Our Lady and Child seated, after a picture by Mr. Edward Prynne; immediately right and left are St. Anne, and St. Elizabeth. The other lights represent St. Agnes and St. Catherine. The window has single windows in the side chapel are filled with figures of St. Mary Magdalen, St. Faith, and St. Lucy. The whole work has been designed and executed by Messrs. Percy Bacon & Brothers, under the supervision of Mr. Geo. Fellowes Prynne, the architect of the church.

WINDOW, MARKET DRAYTON CHURCH.—A new painted window, by Messrs. Powell, of Whitefriars, London, was dedicated at this church lately.

WINDOWS, TRINITY CHURCH, CAPENHURST.—Two stained glass windows have been placed in Trinity Church, Capenhurst, near Chester, containing figures of St. Peter and St. Paul on the north side of the nave, and St. David and St. Augustine of Canterbury on the south side. Three small windows were also lately fixed in the chancel of this church, containing representations of "The Annunciation," "The Nativity," and "The Presentation in the Temple." All these have been executed by Mr. Herbert Bryans, of London.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Hanson & Booth, surveyors and valuers, 35, Church-street, St. Helens, have taken into partnership Mr. R. B. Davidson, who has been in their employ for ten years. The name of the firm will for the present be continued as Hanson & Booth.

APPOINTMENT.—Mr. John William Harrison, one of the assistant sanitary inspectors under the Bradford Corporation, has been appointed building inspector to the Birkenhead Town Council, out of nearly 130 applicants.

THE ELECTRIC LIGHT IN THE CITY.—The Corporation of London at their meeting on the 27th ult. instructed the Streets Committee "to consider

and report forthwith as to the desirability of applying to the Board of Trade for an electric lighting order to enable the Corporation to supply electric light within the City, from a station to be established by themselves or otherwise, and also to report as to the practicability of generating electricity from steam raised by burning the City refuse in specially constructed furnaces in the proposed electric light station."

THE GROSVENOR ESTATE, MAYFAIR.—For the improvement of his property the Duke of Westminster has made another extensive clearance in Mayfair by pulling down Nos. 70 and 70A, South Audley-street, 35-40, North Audley-street, with some workshops in the rear, known as 60, Lees-mews, 10-31, South-street, together with the Grosvenor Riding School, 25-33, Aldford (formerly Chapel) street, Robson's-yard, and Aldford-mews. So many of the houses in this quarter of the town have been re-numbered during recent years that the task of tracing the homes of celebrated residents becomes a difficult one; still, in respect of those cited above, we may mention that in South-street—at a house then numbered 31—have lived the Duke of Orleans (Philippe Egalité), and, in 1810, at a house then No. 22, Beau Brummell.

YORKSHIRE ARCHEOLOGICAL SOCIETY.—The thirty-third annual meeting of this Society was held on the 25th ult. at 10, Park-street, Leeds. The President (Colonel Brooke, F.S.A.) was re-elected, on the motion of Dr. Collins, seconded by the Rev. R. V. Taylor. The Vice-Presidents were also re-elected, and the Hon. Secretary (Mr. William Brown) was re-elected. The report showed that the society is in a prosperous condition financially. Excavations have been going on at Mount Grace during the summer under the supervision of Mr. W. H. St. John Hope. A common grave was made at the west end of the church, where the foundations of the frater were laid bare, and farther to the south, near the kitchen, part of the monastic bakehouse was discovered. This last was a building of considerable size, 12 ft. in diameter. At the east end of the church a cell, forming part of the lesser cloister, was partially excavated. In addition to the excavations, the outer cloister has been drained. If there are sufficient subscriptions, excavations will be resumed next summer, when it will be possible to make a complete ground-plan of this ruin.

THE OLD PRIORY, BIRMINGHAM.—The excavations which are being made in connexion with the rebuilding of the premises of Messrs. Berrill, in the Minors, have once more revealed a portion of the foundation of the Priory of St. Thomas, from which the Old Priory takes its name. The foundations were discovered on the occasion of alterations made a few years ago. They were the foundation-stones of an irregular wall, but what part of the original Priory could not be determined, although from the discovery of the skeleton of a female within the wall and for other reasons it was presumably the wall of the chapel dedicated to the Blessed Mary. Considerable interest was aroused by this discovery, and it not being absolutely necessary to remove them, by the care of the architect and builder, Mr. William Jenkins and Mr. Twigg, the remaining stones were again buried, and thus awaited the next disturbance. They have not had much rest, for the building is now being finally removed preparatory to the entire re-erection of the whole block. A proceeding which necessarily will entirely remove the last possible vestige of the Priory, which has been so many times disturbed. The date of the Priory foundation was about 1280, but the chapel was probably enlarged or rebuilt by Fulk Byrrymingham about 1340. The whole was surrounded by the burial-place or cemetery of the fraternity, the Augustinian Friars, and public worship and burials were continued till about 1547, when the Friars and their Prior were removed, and the Crown seized upon the whole estate, including the chapel and the dead bodies. The reappearance of the foundation-stones of the Priory has been looked for with some interest, and by the direction of the architects, Messrs. Essex, Nicol, and Goodman, every care has been taken by the foreman and clerk of the works in having the ground reopened. The extent of the remains has, however, been considerably reduced, and only one important block now remains. This was examined on the 27th ult. by Mr. J. A. Cossins, Mr. Joseph Hill, Mr. Wright Wilson, Mr. R. K. Dent, and others. Some of the stones give clear evidence of having been previously used several of them having the colouring and whitened sides still preserved, and traces of colour still perceptible.—*Birmingham Post.*

MEETING OF BUILDERS' LABOURERS, NEWCASTLE.—A mass meeting of builders' labourers was held on the 27th ult. in the Irish Institute, Clayton-street East, Newcastle. Mr. W. Flynn, president of the Newcastle and Gateshead Trades and Labourers' Union, presided. Addresses on the benefits of combination were delivered by the Chairman, Mr. J. N. Bell, organiser, and Mr. J. Kelly, district delegate of the National Amalgamated Union of Labour, and a resolution to form a branch of that organisation was passed unanimously.

BUILDERS' ASSOCIATION, OLDHAM.—The annual dinner in connexion with the Oldham and District Builders' Association was held at the King's Arms Hotel recently, Mr. Samuel Smethurst presiding. W. Cunliffe, Vice-President of the Lancashire Federation of Builders, submitted the first toast,

"The Oldham and District Builders' Association." In doing so, he referred to the recent dispute in the engineering trades, and said that he hoped that as far as the building trade was concerned there would be no such disturbance during the year. Still, he was not quite sure whether, during the year, there would not be some disruption in their trade, and they might be called upon to maintain their rights. It seemed to him that the employers in the building trade were fifty years behind the time. If they looked at the operatives' associations, they saw an almost perfect machine. The masters could only hope to meet such forces by being thoroughly bound together, and he was sorry to find this was not the case. He trusted that the strength of their Association would increase locally, and that in Oldham there would be complete organisation. During the year they would be faced with two or three troubles, and one would be the question of foremen being in the union. Some masters did not take a very serious view of the matter, yet it was a very serious thing. Foremen were constantly in charge of jobs, but if they were bound by the union then they would not thoroughly look after their master's interests, and the master would have no man to look after his equitable and moral rights. After twenty years' experience, he could say it was far more difficult to-day than it ever had been to conduct their business, for on every side they had to meet cast-iron and fixed rules. In conclusion, he said that the Association existed for the purpose of self-defence and nothing else.—In replying, Mr. Smethurst said that their Association ought to become more alive to the fact that they needed to be thoroughly organised for defensive purposes, which would enable justice and fair play to be given to both sides.—The toast, "The Lancashire Federation of Building Trades," was then proposed by the Chairman, and, in responding, Mr. Storr (President of the Federation) agreed that it would be far better if they all thoroughly organised themselves into one strong band.

SELL'S DIRECTORY OF REGISTERED TELEGRAPHIC ADDRESSES.—We have received the new issue of this excellent work from Mr. Henry Sell (Fleet-street, E.C.). It is published annually with three quarterly editions; is compiled from official lists supplied by the authority of the Postmaster-General, and is a useful and well-arranged work brought well up to date. Issued with the work is a diagram showing how to travel or cable to any part of the British Empire.

THE MODERN TENEMENT.—At the quarterly meeting of the Glasgow Master Wrights' Association, in the Building Trades' Exchange, Gordon-street, on the 27th ult., Mr. Ninian Macwhannell, architect, delivered an address on "The Modern Tenement—Constructive and Artistic." He submitted a number of plans of buildings recently erected in Glasgow, which he criticised, and, in the course of his remarks, stated that the first consideration in planning was the comfort and health of the incoming tenants, and that could only be secured by seeing that light and air penetrated every corner of the house. Dark recesses meant dirt, and it might safely be assumed that where light did not penetrate air did not circulate. There must be no stagnation of air. Every house should be so planned as to facilitate a change of air. He classified the modern tenement as follows:—(1) a plan—the internal staircase plan, and the balcony plan—and favoured the internal staircase plan, because the balcony, projecting, as it did, 4 ft. from the building, interfered with the light (this was not noticeable if the windows faced the north); it also interfered with the circulation of air. Balconies did not give the same amount of privacy that is afforded by the internal staircase. The planning of single apartment houses in the same tenement with room and kitchen houses was to be commended and encouraged. Every house, not including the single apartment house, should have its own water-closet; the system of providing one water-closet for two or four houses in new tenements was condemned. All gaspipes should be exposed, and iron substituted for the usual black tin. Better glass might be adopted to glaze windows, as the amount of light was considerably modified by the quality of the glass.—*Scotsman.*

SCOTTISH BUILDING TRADES FEDERATION.—A meeting of the Executive of the Scottish Building Trades Federation was held on the 27th ult. in the Building Trades' Exchange, Glasgow. Mr. John B. Hay, builder, Dundee, President, occupied the chair. Members were present from all parts of the country, including Inverness, Aberdeen, Dundee, Perth, Edinburgh, Kirkcaldy, Hawick, Glasgow, Motherwell, Dumfries, and Dumfermline. The meeting had under consideration various matters, including the report by the Secretary (Mr. James L. Selkirk) on the formation of new branches, from which it appeared that nearly all the more important towns throughout the country had been federated. A report was also given on the progress made regarding the adoption of the proposed "General Conditions of Contract," which was considered encouraging. On the question of an eight hours day, which had been agitating some of the branches, a resolution was unanimously adopted to the effect that the Federation use every effort to resist its introduction as most uncalled for, and likely to prove highly injurious to the general interests of trade.

BUILDING TRADES' FEDERATION, BARNSEY.—The second annual dinner of the Barnsey Building Trades' Federation was held a few days ago at the "Coach and Horses Hotel." Mr. Councillor W. Dunk, President, occupying the chair. The customary loyal toast having been drunk, the Chairman proposed "The Yorkshire Federation of Building Employers." Mr. S. Hanson (Halifax), Secretary of the Yorkshire Federation, responded, and, in giving particulars of the Federation, he represented, he said it was formed about September 30 last, with a membership of 250, and at the present time they had a membership of about 400.—Mr. T. Lindley submitted "The Mayor and Corporation," which was acknowledged by Mr. Councillor Taylor and Mr. Councillor Dunk. The "Town and Trade of Barnsey" was given by Mr. Medley and responded to by Mr. England and Mr. Guest (Blackley Hill). Mr. Goodyear proposed "The Building Trades Federation," which was responded to by Mr. R. Rymer and Mr. Snowden, the latter of whom said the Federation was not formed with any antagonistic feeling towards any one. Other toasts followed.—The officers of the Federation for the present year are: President, Councillor W. Dunk; Vice-Presidents, Councillor E. R. Taylor and Mr. William Goodyear; treasurer, Mr. T. Lindley; secretary, Mr. R. D. Snowden.

BUILDERS' EXCHANGE CLUB, LEEDS.—The annual dinner of the Leeds Builders' Exchange Club was held on the 28th inst. at the Grand Restaurant, Leeds. Mr. W. Lloyl presided. The patriotic toast having been duly honoured, Mr. J. Speight gave "The Lord Mayor and City Council." Councillors Batley and Carter acknowledged the toast. "The Chairman, Deputy-Chairman, Buildings Clauses Committee, and Officials," was proposed by Mr. C. F. Wilkinson, who said the committee was the hardest working committee of the Corporation. When they considered that 2,100 plans passed through their hands last year, or 20 per meeting, they would agree that the duties of the committee were arduous and trying. No fewer than 2,350 houses were shown upon these plans, consisting of 21 villas, 54 semi-detached houses, 747 detached houses, 1,528 back-to-back houses, and 36 miscellaneous properties, such as hotels, clubs, hospitals, baths, &c. Mr. Wilkinson suggested that the new building by-laws should be altered in several respects. Councillor Carter, Mr. D. Hainsworth, and Mr. W. Towers responded. Mr. Freeman gave "The Leeds Builders' Exchange Club," and Mr. Dewes responded. He stated that, notwithstanding the strike of last year, the club was in a prosperous condition. Although there was no strike this year, the outlook was not very pleasant, as the masons, joiners, plasterers, and plumbers had sent in notices for increase of wages and alteration of rules. The Workmen's Compensation Act would occasion many lawsuits before there was a common ground established, and this would necessitate a serious outlay on the part of builders. Referring to the federation of master builders throughout Yorkshire, he said that it was necessary that the whole of the builders of Yorkshire should amalgamate. All the builders were federated together in Lancashire, and as a result they could carry on their work better than the builders of Yorkshire. They had an object-lesson in the benefits of federation in the engineers' strike. In the future the men would probably desire to vote instead of striking, and it therefore was the bounden duty of all masters to federate and vote also.—The other toasts included the health of the visitors, the Chairman, and the secretary.

THE HOUSING OF THE WORKING CLASSES.—At the Leeds and County Liberal Club, on the 20th ult., Mr. W. S. Braithwaite, architect, delivered a lecture on "The Housing of the Working Classes," with special reference to the Leeds sanitary area. The lecturer referred in detail to the various steps which had been taken in Leeds to deal with insanitary and overcrowded areas. There was, however, an area upon which dwelt 12,000 persons, which was insanitary, and which the medical officer had condemned as unhealthy. This ought to be taken in hand. Many authorities laid special stress upon the desirability of putting in order existing dwellings, rather than a wholesale demolition. A careful examination of the Ordnance Survey of this particular district showed that the purchase and displacement of a block of buildings here and there would admit light and air and ventilation into what were now close and confined courts or yards. Why, the lecturer asked, should the Corporation wait? The powers they possessed under the 1890 Act were sufficiently strong for all practical purposes and would result, if enforced, in the production of healthy homes. There were also hundreds of houses in Leeds which could not be described as healthy—houses in better districts, with cellar kitchens 6 or 7 ft. below the street level, in which the family as a rule lived, occasionally using the sitting-room above if it was not too late to lodge. It would require a very courageous medical officer to declare such houses unhealthy. The lecturer having referred to the different types of houses provided for the better-class artisans, asked what could be done for the labourer and those persons with the weekly income not exceeding 20s. a week. The Sanitary Committee intended building a number of houses on the Ivy House estate. Tenement dwellings seemed to be the only solution of the question, and he believed that the Committee intended on a portion of the estate to erect those

tenements technically known as "flats." It was open to question whether these dwellings were desirable. The poor regarded them with aversion, and they were objectionable in many respects from a light and airy point of view. The nearest solution, and the cheapest, in his opinion, was the two-story tenement, such as was erected in great numbers at Newcastle, Stockton, Jarrow, and other towns. They were light, airy, and well ventilated, with a through current of air. These houses were complete in themselves, having independent staircases, and containing living-room, scullery, and bedroom. The Local Authorities were the proper persons to erect these dwellings, which could be let, the lower rooms at 2s. 6d. a week, and the upper (with additional bedroom) at 3s. By erecting tenement houses of not more than three stories on three sides of a quadrangle, a playground would be left in the middle, and the houses would be attractive to the masses of the working people. In the insanitary area to be dealt with in Leeds, there were thirty-five common lodging-houses, and it was to be hoped that the Corporation would take steps to provide good municipal lodging-houses or houses when these were demolished.

NATIONAL REGISTRATION OF PLUMBERS: PUBLIC MEETING AT EXETER.—A public meeting was held at the Guildhall, Exeter, on Saturday last, under the Presidency of Alderman Domville. In presenting certificates of registration to several plumbers, the Chairman said that he considered it right, being a medical man, that he should accept the invitation to preside over a meeting which had such far reaching results in the matter of public health. The object which the Plumbers' Company had in view was worthy of the assistance of every citizen. Mr. W. J. Addison then read a paper explaining the work of the Plumbers' Company, and the object it was hoped to obtain by the passing of the Plumbers' Registration Bill. He proposed the following resolution, which was seconded by Mr. Councillor Cole, supported by Mr. Harvey, and carried unanimously: "That this meeting of public representatives, master and operative plumbers of Exeter and district, desire to express their approval of the efforts of the Worshipful Company of Plumbers to elevate the craft, protect the public from bad plumbing, and give effect to these objects by a Bill about to be promoted in the House of Commons during the forthcoming session of Parliament."

THE TECHNICAL LECTURES IN THE CITY.—The Carpenters' Company hold three courses of lectures in their hall during the year, and are issuing the programme of that course which appeals to a larger and more general audience than the highly technical courses given in the early summer and autumn. These lectures, which begin on the 21st inst., and are, of course, more especially addressed to those engaged in architecture and building, will be fully illustrated by experiments and lantern slides. Among the lecturers are Professor Sylvanus Thompson, Professor Banister Fletcher, Professor Roger Smith, Mr. Lewis F. Day, and Dr. Longstaff. Sir John Lubbock and Sir Arthur Blomfield are among the gentlemen who have promised to preside. The subjects, &c., will be announced in our advertisement columns next week.

SLATE TRADE IN 1897.—The loss of tonnage caused by the Penryn strike was not made up by the increased output of the other quarries in the Bangor district, and in the Festiniog district the tonnage is about the same as in the previous year. It is a matter of regret that the financial statistics, to which we recently called attention, do not convey accurate information as to the value of the slates made. An important case as to fencing, under the Quarries Act, was tried at Carnarvon, and the magistrates decided in favour of the quarry companies; there have been several other prosecutions, in some of which small penalties were inflicted. The building trade throughout the country promises well, and the settlement of the engineers' strike will help it materially.

STATUE OF A BOLTON DOCTOR.—In Queen's Park, Bolton, on the 20th ult., a memorial statue of the late Dr. James Dorrian was unveiled. The statue was the work of Mr. John Cassidy, sculptor, Manchester, and is of Portland stone.

ILLUSTRATIONS OF THE BUILDER.—A paragraph appears in a periodical called *The Process Photogram*, under the heading "Collotype Grain for zinc and lithography," to the effect that "Waterlow's, of London, have for six or seven years used a similar process (phototint) for the plates in the *Builder*." This is an entire mistake. If we remember right, Messrs. Waterlow did at one time supply a few plates for this journal, but Messrs. Sprague's "ink-photo" is the only grained process which has been continuously employed in our illustrations for a good many years back.

CAPITAL AND LABOUR.

ABERDEEN JOINERS.—The operatives adhere to their request for an increase of the standard rate of wages from 8d. to 8½ p. per hour. The masters consider a rise uncalled for, and also object to the demand that extra time be paid at the rate of time and a half; but, in order that a strike may be avoided, they have agreed for their part that the matter shall be settled by the arbitration of the newly-consti-

tuted Conciliation Board.—The operatives have since agreed to settle the matter by arbitration.

THE CARPENTERS' STRIKE AT TAVISTOCK.—A representative committee of the Amalgamated Society of Carpenters and Joiners from Plymouth met the master builders and carpenters of Tavistock at the Temperance Hotel, in the latter town, on the 2nd ult., with the view of effecting a settlement of the questions on which the men came out on strike on April 1 last, and which had remained open since. After considering the several points at issue for more than two hours, it was agreed that the men should in future work fifty-three and a half hours instead of fifty-six in the summer, and fifty-one in winter as previously, and that the minimum rate of wages should be 6d. per hour instead of 5d.

WAGES IN THE COVENTRY BUILDING TRADE.—The Coventry Master Builders' Association have received applications for increases from the plumbers, painters, and glaziers, and carpenters and joiners. The plumbers are getting 8½ d. and 9d. per hour, and they ask for a rise of ½ d.; the painters and glaziers receive 7½ d., and they want 8d.; and the carpenters and joiners, who received an advance last year, demand a ¼ d. extra per hour—from 8½ d. to 9d. Before any definite decision is arrived at, deputations from masters and men will meet in conference on the applications.

LEGAL.

PICCADILLY BUILDING CASE.

THE case of Marshall v. Mackintosh came before Mr. Justice Kennedy in the Queen's Bench Division on the 20th inst. The action brought to recover damages for alleged breach of an agreement made between the plaintiff and the defendant of a lease of certain ground, the site of Holloway's Hotel, Piccadilly, for a term of eighty years, from June 24, 1896, at a peppercorn rent for the succeeding year. The lessee was to take down and clear away the old buildings and to build new buildings on the site. On January 19, 1897, December 25, 1896, to erect new buildings in carcase. The agreement contained a provision for re-entry in the event of the buildings not being completed by the day named, or the work not being proceeded with with due diligence. The lessee was entitled to the grant of the lease on the completion of the new buildings. On January 19, 1897, the old buildings had not been cleared away, and the plaintiff re-entered and took possession of the premises. The plaintiff subsequently was compelled to let the ground to another tenant at a greatly reduced rent, beginning to run from June, 1898. The plaintiff claimed damages—(1) loss of one year's rent, 1,100 l.; (2) loss by reduction of rent after June, 1898.

Mr. E. Morien appeared for the plaintiff, and the defendant appeared in person. Mr. Justice Kennedy, in delivering a reserved judgment, said, owing in some degree to the fact that the defendant had not had the advantage of professional assistance, the evidence which had been put before him was not sufficient to satisfy him. There were two questions—one of law and the other of fact. The first was whether, upon the construction of this particular agreement, the right of the plaintiff was taken away by the retaking of possession. He would not decide that question at the present stage, though he was inclined to think there must be at least nominal damages. The second question was one of damages (if any) was the plaintiff entitled to recover? The test was what was the real money loss to the plaintiff. The evidence was not sufficient to satisfy him on that point. The case would therefore be referred on that point, when it could be ascertained what damages (if any) the plaintiff had sustained, having regard to all the circumstances.

MEETINGS.

FRIDAY, FEBRUARY 4.

Architecture Association.—Mr. John Belcher on "Hampton Court Palace," illustrated by lantern views. 7.30 p.m.
Royal Institution.—Mr. Alan A. Campbell Swinton on "Some New Studies in Cathode and Röntgen Radiations." 9 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "Electro-Magnetic Brakes and their Capabilities," by Mr. Louis H. Walter. 8 p.m.

SATURDAY, FEBRUARY 5

Architectural Association.—First Spring Visit, to five houses in the vicinity of Park-lane, W.

Royal Institution.—Professor Patrick Geddes on "Cyprus." 11. 3 p.m.

London and Provincial Builders' Foremen's Association.—Annual Dinner, Holborn Restaurant. 7 p.m.

British Institute of Certified Surveyors.—Visit to Messrs. Speer's new premises, St. Paul's Churchyard, at 3 p.m. Meeting at 6 p.m.; paper by Mr. G. Ellis, entitled "Some Account of the Structure of Timber."

MONDAY, FEBRUARY 7.

Royal Institute of British Architects.—(a) Announcement of the name of the Royal Gold Medalist for 1898, (b) Mr. E. O. Sachs on "The Housing of the Drama." 8 p.m.

Royal Academy of Arts (Lectures on Architecture).—Professor Aitchison, R.A., on "The Italian Renaissance." 11.1. 4 p.m.

Surveyors' Institution.—Adjourned Discussion on Mr. A. A. Hudson's Paper on "Technical Tribunals, and Surveyors as Arbitrators." 8 p.m.

London Institution.—Professor Vivian Leves on "Incandescent Gas Lighting," illustrated, 8 p.m.

Society of Arts.—Lecture by Mr. Cyril Davenport on "Decorative Bookbinding." III. 8 p.m.

Liverpool Architectural Society.—Mr. W. H. Bidlake, M.A., on "The Quality of Strength in Architecture." 6 p.m.

Society of Engineers.—(1) The President for the past year, Mr. George Maxwell Lawford, will present the Premiums awarded for papers read during the year. (2) President for the year 1897, Mr. William Worby Beaumont, will deliver his inaugural address. 7.30 p.m.

Leeds and Yorkshire Architectural Society.—Mr. W. H. Thorp on "Early Renaissance Sculpture in Tuscany." 7.30 p.m.

WEDNESDAY, FEBRUARY 9.

Surveyors' Institution.—Annual Dinner, King's Hall, Holloway Restaurant. 6.30 p.m.

Society of Arts.—Mr. A. D. Provand on "Compensation to Workmen." 8 p.m.

Institution of Electrical Engineers.—(1) Conclusion of Discussion on Major-General Webster's paper on "The Electro-Chemical Treatment of Ores containing the Precious Metals." (2) Mr. Sherard Cowper-Coles on "An Electrolytic Process for the Manufacture of Parabolic Reflectors." 8 p.m.

Sanitary Institute.—Discussion to be opened by Prof. J. Lane Nott, M.A., on "Purification of Water for Barracks, Prisons, and other Institutions." 8 p.m.

Perth Architectural Association.—Mr. J. V. Gray on "The Graphical Solution of Problems in Architectural Dynamics." 8 p.m.

Edinburgh Architectural Association.—Mr. J. A. Williamson on "The Vernacular of the Wren School," with line light illustrations. 8 p.m.

THURSDAY, FEBRUARY 10.

Royal Academy of Arts (Lectures on Architecture).—Professor Atchison, R.A., on "The Italian Renaissance." IV. 8 p.m.

Society for the Encouragement of the Fine Arts.—Mr. C. E. Keyser, F.S.A., on "Aldernaston Church and its Monuments." Line-light illustrations. 8 p.m.

Royal Institution.—Dr. John Paul Richter on "Some Italian Pictures at the National Gallery." I. 3 p.m.

Society of Antiquaries.—8.30 p.m.

Institution of Mechanical Engineers.—Annual General Meeting. Continuation of Discussion on Mr. P. Dawson's paper on "Mechanical Features of Electric Traction." Other papers to be read. 7.30 p.m.

FRIDAY, FEBRUARY 11.

Royal Institution.—Dr. J. H. Gladstone on "The Metals used by the Great Nations of Antiquity." 9 p.m.

Institution of Mechanical Engineers.—Annual General Meeting (concluded). 7.30 p.m.

SATURDAY, FEBRUARY 12.

Edinburgh Architectural Association.—Visit (1) to the Prudential Assurance Buildings, St. Andrew-street; (2) Edinburgh Stock Exchange, St. Andrew-square; (3) Jenner's Buildings, Princes-street.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until March 12.

[1897.] 75.—CHIMNEY TOPS: *W. T. Norris*.—The chimney top is made in three parts; the lower part, fitting on to the brickwork, is cylindrical or conoidal in shape, and acts as a reflector for the smoke, the middle part, of similar shape, fits over the lower part, the two being so arranged as to afford an air space or inlet all round. The casing is connected to the lower part by rings or brackets.

76.—SASH FASTENERS: *J. Tauger*.—In two parts; the back sash part, screwed on to the meeting rail, has a vertical rod of required height, the front sash part carries a plate, extending partly over the back meeting rail, pierced for carrying the rod, which is notched or grooved for the turning of a butt or lever working on the plate.

3,210.—WINDOWS AND THEIR SASHES AND CASEMENTS: *H. C. Webb*.—The sashes are disposed in a direct line, or with one above or at the side of the other, and connected by hinges or joints to the framing or casement; thus they do not slide, but open in or out, on trunnions or pivots, their movements being controlled by fly fronts or fittings hinged on to the frames.

3,422.—MATHEMATICAL DRAWING INSTRUMENTS: *C. J. Clayton*.—The inventor attaches to a drawing pen or pencil handle, or the radius leg of compasses, a bracket carrying a toothed wheel which engages, with a projection on a movable pen or pencil; on or in the handle or radius leg is a spring or weight, operating upon the pen or pencil, and by the alternate raising or lowering of the pen or pencil by the wheel and spring or weight, dotted lines may be drawn.

3,710.—PIPE JOINT FOR SANITARY PURPOSES: *Jenkins & Archer*.—This consists of a spigot formed on the end of one pipe which enters a socket on the end of the other, with a space between them, into which fits a screwed collar; the socket's inner-end is preferably dove-tailed to receive a rubber or other ring, distended when the collar is screwed in, so as to make a sealed joint (of earthenware, brass, &c.).

3,737.—APPLIANCE FOR USE IN CLEANING WINDOWS, WALLS, &c.: *Edith M. Jackman*.—A bag inflated air-cushion is held between two spring clips turning on pivots at the unconnected ends of a three-sided frame, to which the cushion and clips can be swung end for end; to the frame is attached a handle in one length or more; the duster and leather are placed over either surface of the cushion.

4,571.—LADDERS: *L. de L. Wells (Commander R.N.)*.—To give increased strength, the rounds are attached to side bars by socket pieces, which have flanges or projections which bed on shoulder sides of the inner sides of the bars; thus, much of the load is transmitted on to the front side of the side bar, while the shearing strain on the socket piece fastening is reduced.

4,913.—LADDERS: *H. Sullivan*.—Made in sections, with hinges placed alternately on the back and front, so that the sections may be folded against one another; a spring clip retains in position the sections when extended.

5,201.—VENTILATORS: *W. T. Sugg*.—This improvement, especially designed to prevent water passing down the shaft with which the cowl is connected, consists of the combination with a suction-cowl of a vertical deflector and a trap for conducting the water outside the cowl, the air current, which induces a vacuum in the cowl, being directed by the deflector.

5,314.—GREENHOUSES, HOTHOUSES, FORCING FRAMES, &c.: *J. Beagrie*.—The parts are so shaped as to be capable of arrangement in different ways, by which means composite structures of various forms can be obtained. The parts consist of glazed metallic frames, with flat glass, the skeleton of the house or frame being composed of stays or trusses arranged parallel-wise for receiving the frame top or side.

5,607.—APPLIANCE FOR SECURING AXES, HAMMERS, AND OTHER TOOLS TO THEIR HANDLES: *Wilkinson Sword Company*.—Three metal wedges or keys are driven into the handle within the loop of the tool, three parallel saw-cuts are made in the handle-end before it is fitted into the eye of the tool; the wedges expand the wood of the handle, and should the wood shrink, and so cause slipping of the tool, the middle wedge is held by its projecting head and is drawn slightly outwards.

6,231.—SOCKETLESS ACCESS PIPE FOR CONNECTING OR REPAIRING DRAIN PIPES WITHOUT DISTURBANCE OF THE MAIN DRAIN: *Oates & Green*.—The access pipe is fashioned with both ends alike—i.e., both spigot and socket end is inserted into the socket of the main drain-pipe, whilst the other abuts against the spigot end of the adjoining pipe, and a fireclay ring is drawn over the joint to form a socket; the access pipe has a top opening provided with a cover.

10,458.—VALVES AND FITTINGS FOR LAVATORY AND OTHER PURPOSES: *M. J. Adams*.—A vertical tube is so arranged in a socket that it may slide up and down at will. When this is fixed in a lavatory basin or other vessel, and is drawn out, water will remain in the vessel at that level; when it is pushed down within the socket the water will flow away. The water supply can be arranged to act without taps upon a tipping bucket, or with a vessel, or displacer.

20,151.—A DOOR KNOB AND SPINDLE ATTACHMENT: *A. Waterhouse*.—The spindle is square and has, at each corner, the nut is round and chased across its edge; the knob-neck is cast with a square hole to fit the spindle, and there is a long hole in its top for admitting the nut to drop in and screw to the spindle end; the round hole is large enough to slip over the neck, and thus to let the knob be fastened to the spindle.

23,518.—ADJUSTABLE SECTIONAL PIPE BENDS: *Lambert and Others*.—The pipe-bend (for street use, other uses, &c.) is composed of a series of independent sections pivoted to one another, and has inner levers for its adjustment to the required angle or curvature.

24,139.—BACKS FOR FIXING PURPOSES: *H. G. Jarvis*.—The brick is made of clay or brick-earth (two parts), wood sawdust (two parts), and cinder-ash or coal-dust (one part), and is intended as a substitute for wood plugs or wood bricks used, to enable nails and screws to be driven therein, for woodwork, mouldings, cornices, weathering tiles, and so on.

26,450.—STONEWARE AND METAL PIPE JOINTS: *J. Hall*.—The pipes have plain cylindrical joints between them, they are made by means of two cup-shaped rings or sockets of metal, paper, or other material, cut, stamped, spun, or otherwise prepared, so as to assume any external shape. These have slots through which the grooves or fillets in, passed, and the joint is covered with a strip of tape of linen, glue, asbestos, or other fibre.

27,104.—FLOORING MATERIAL: *H. Eichler*.—The material, shaped into flags or plates, is made of sifted or screened sawdust, quartz, and pounded lime, unslaked. A design in colour can be incrustured in the flag, which, when dry, is smoothed on a grindstone.

NEW APPLICATIONS.

For week ending January 22.

1,233. R. A. Hammersley, a Combined Lavatory Basin and Toilet Table. 1,236. F. C. Lynde, Baths, Lavatory Basins, Sinks, and the like. 1,240. J. Ward, Crucible Furnaces. 1,247. Sugden & Bailey, Ash Pans and Guards for Grates. 1,248. H. S. Parry, a Mire Machine. 1,250. A. W. Loveland, Oil Varnish for House Decorators. 1,256. H. Hauser, Shower Baths. 1,261. H. Button, a Nail. 1,263. A. Pass, Lenden Waterpipes, &c. 1,268. A. Kille, a Combination tool for use in Paperhanging and for similar purposes. 1,275. G. S. Martin, Joints for Tubular Framework. 1,283. A. V. Pittar, Oil Cans. 1,284. J. Gange, Water-waste Preventers. 1,287. A. Wacht, Vases. 1,289. Heaton & Thomas, for Compelling Flow of Gas by Currents of Liquids. 1,291. R. F. Shillingford, for Attaching Roller Blinds, Cloths, and the like to their Fittings. 1,297. F. C. Bormann, Heating Stoves. 1,299. J. C. Hudson, Fire Extinguishing Apparatus. 1,314. Collin & Brunckhorst, Moulding-boxes for Making Tubular Articles. 1,315. J. Rodgers, Turret Lathes. 1,318. Bonn & Rothschild, Measuring Sticks. 1,320. P. Kierder, Building Stones and the like. 1,326. T. King, a House Window Brake. 1,338. T. W. Twyford, Baths. 1,346. P. Meredith, a Window Sash Fastener. 1,350. W. Clews, Syphon Check-flow Taps for Drawing Liquids. 1,356. C. Chisholm, Metal Ferrules for Pipe Joints. 1,371. H. Breuer, High pressure Ribbed Pipe. 1,373. F. Marryat, Windows and their Fittings. 1,377. J. Jones, Sleeves for Pipe Joints. 1,378. A. Litholite, a Manufacturing Company. 1,380. J. H. Scott & Hawkins, Pigments for Paints. 1,389. A. Robertson, Sheet Metal Structures. 1,405. H. Howard, and 1,693. F. E. Ellis, Metal Tubes. 1,410. J. E. Duncan, Sashes. 1,443. J. C. Berry, Brick Presses. 1,452. Haywood & Abbott, Nail, Spikes, &c. 1,472. W. S. Spurge, for Controlling the Flow of Water in Pipes. 1,474. W. S. Newton, Taps, Cocks, &c. 1,478. Grimshaw & Thomson, a Sanitary Pipe Joint. 1,480. J. H. Atres, for Drawing-off Measured Quantities of Liquids, and giving a Constant Flow at the same time. 1,498. J. Pfister, Imitation Stained Glass. 1,505. Dodd & Smith, and 1,506. H. Greenwood, Moulding Presses, for Paper and other uses. 1,507. M. M. Angel, and 1,746. J. Cooper, Brushes. 1,528. W. S. Brookie, Automatic Lathes. 1,562. H. Bennett, Oil or Gas Cooking Ovens. 1,566. A. Sharples, for Forcing, Sizing, and Projecting Liquid. 1,568. J. T. Inglis, Water-closet Cisterns. 1,585. H. R. Ridall, Chimney Flues, &c. 1,598. M. Bousfield, a Chimney Top. 1,607. W. Allen, a Cowl. 1,612. J. Clark and others, Cement Edging. 1,620. Matthews & Kent, for Fixing and Levelling Billiard Tables and other Furniture. 1,623. H. A. Zecken-dorf, Tool Handles. 1,632. W. Fogg, Stone Breaking and Crushing Machines. 1,647. J. Morris, Plastic Mould. 1,666. A. E. Hold, a Ratchet Pulley. 1,685. W. H. Bussell and others, for Heating and Circulating

Water. 1,711. W. W. Wardle, and 1,713. W. Tattersall, Brick-drying Apparatus. 1,727. H. Higgins, for Drying and Warming Air for Ventilation, Desiccation, and Evaporation. 1,729. R. J. Lines, Taper-cutting Machines. 1,734. Wootton & Martin, Metallic Tubing. 1,744. Campbell & Montgomerie, Safes, Strong-room Doors, &c. 1,750. R. Simpson, for Planing Mire and similar Inclined Surfaces. 1,753. J. Gourlay, a Combined Lavatory Basin and Bath. 1,758. H. K. Bromhead, Fireproof Roofs and Floors. 1,763. J. Winterlood, Instantaneous Water-heaters. 1,756. B. K. Puri, Raising and Lowering Window Sashes. 1,759. P. Kleber, Fireproof Building Stones, and Cement from the same. 1,788. F. E. Winslow, Means for Preventing Infection and Ensuring of Cleanliness for Use with Water, Earth, or other Closets. 1,791. J. Ellis, Slabs or Boards for Fireproofing Ceilings, Walls, Doors, &c. 1,795. S. Pudney, a Spray Pump. 1,813. J. Craig, Window Frames and their Sashes. 1,818. H. M. Williams, Door Knobs or Handles and Spindle Attachments.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 21.—By R. GILLART & SONS (at Machynlleth).
Mallwyd, Merioneth. "The Garthneig Slate and Slab Quarry," 800 a., u.t. 22 yrs., r. 100l., including plant, &c. £8,000
January 24.—By WEATHERALL & GREEN.
Mitcham.—Stratham-lane. "The Gorrage Park Estate," 69 a. u.t. 22 p., f. 20,100
Whitechapel.—By ALFRED SAVILE & SON.
9 yrs., g.t. 10l. 25, 35, and 32, Varden-st., u.t. 350
By ELLIOTT, SON, & BOYTON.
Norwood.—30 and 24, Portland-rd., f. r. 102l. 1,830
Anerley.—183 and 195, Croydon-rd., u.t. 59 yrs., g.t. 14l. 10s., r. 110l. 705
Oxford-st.—47, Upper Rathbone-pl., f. r. 45l. 920
Hyde Pk.—159, Westbourne-rd., u.t. 44 yrs., g.t. 5l., r. 130l. 810
By W. A. BLAKEMORE.
Stoke Newington.—81 and 83, Alkham-rd., u.t. 82 7/3 yrs., g.t. 12l., r. 64l. 735
Clapton.—London-rd., f.g.t. 124, reversion in 61 yrs. 405
Fulham.—9 to 21 (odd), Orban-rd., u.t. 87 yrs., g.t. 28l. 13s. 1,000
Poplar.—2, Shilbury-st., f. r. 19l. 10s. 205
12, 13, 14, and 15, James-pl., c., r. 62l. 8s. 465
Cheshunt.—Cheshunt-st., "Greenhall," c., r. 15l. 305
1 to 5, Mill-lane, c., f. 47l. 17s. 3d. 290
By STRAKER & SON (at Brynmawr).
Llanelli, Brecon.—"The Rhonow Farm," 109 a. 2l. 8 p., f. 1,210
January 25.—By C. W. DAVIES.
De Beauvoir Town.—29 and 31, Ardleigh-rd., u.t. 30 1/2 yrs., g.t. 12l., r. 92l. 720
Islington.—6, 7, 8, and 9, Didden-st., u.t. 46 1/2 yrs., g.t. 24l. 495
Highbury.—48, Highbury-hill, u.t. 67 yrs., g.t. 12l. 15s., r. 65l. 500
Barnsbury.—62, Albert-st., u.t. 50 yrs., g.t. 6l., r. 12l. 265
By J. J. DEVERELL.
Finsbury-park.—24, Oakfield-rd., u.t. 78 1/2 yrs., g.t. 10l. 10s., r. 50l. 650
By GRAVES & SON.
Bayswater.—36, Kildare-ter., u.t. 53 yrs., g.t. 7l., c. r. 80l. 620
By J. & R. KEMP & CO.
Regent's-park.—44, 46, 50, 52, 54, and 56, Albany-st., u.t. 26 1/2 yrs., g.t. 60l., f. 432l. 10s. 3,690
13 to 26 (odd), Little Albany-st., u.t. 26 1/2 yrs., g.t. 27l., f. 139l. 670
145, Albany-st., u.t. 15 yrs., g.t. 15l., r. 56l. 300
Marylebone.—Montagu-sq., &c., f.g.t. 67l. 9s., u.t. 31 yrs., g.t. 11l. 110
By ALEX. PHILLIPS.
Kilburn.—21, 23, 25, 27, and 31, Turret-rd., u.t. 89 yrs., g.t. 50l., f. 250l. 2,605
9, 11, 13, and 21, Plympton-rd., u.t. 92 yrs., g.t. 38l. 7s., r. 183l. 3,795
Mare Vale-rd., Clifton-hill, u.t. 53 yrs., g.t. 12l., c. r. 75l. 605
Harrow.—Pinner-rd., two freehold building plots 210
By RUTLEY, SON, & VINE.
Tottenham Court-rd.—10, Little Goodge-st., f. r. 85l. 9s. 660
By S. H. BAKER (at Masons' Hall Tavern).
Piccadilly.—Denman-st., "The Devonshire Arms" p., u.t. 26 1/2 years, r. 120l., with goodwill. 11,000
By BELTON & SONS (at Masons' Hall Tavern).
Marylebone.—Westmoreland-st., "The King's Head" p.h., an improved rental of 65l. for 15 1/2 years, with reversion for 71 years. 1,010
Kingsland.—Mansfield-st., "The Middleton Arms" p.h., a freehold rent of 100l., reversion in 39 1/2 yrs. 3,000
Bethnal Green.—Bacon-st., "The Ship" p.h., a freehold rent of 70l., reversion in 9 1/2 yrs. 2,000
By ELLIOTT, ELLIS, & CO. (at Plymouth).
Plymouth.—Old Town-st., "Chubb's Hotel," together with 1, 2, and 3, East-st., f. 34,500
January 26.—By BEARD & SON.
Bayswater.—16, Burlington-rd., u.t. 61 years, g.t. 10l., r. 100l. 460
By HANMAN BROS.
Wandsworth.—44, West Hill, u.t. 86 yrs., g.t. 10l., r. 55l. 570
By INMAN & CO.
St. John's Wood.—4, Bolton-rd., u.t. 52 yrs., g.t. 10l. 10s., r. 40l. 495
By E. W. RICHARDSON & SON.
Hornsey Road.—65 and 68, Mulken-rd., f. c. r. 70l. 1,050
New Southgate.—26, 27, and 28, The Avenue, f. r. 65l. 520
January 27.—By WHEATLEY KIRK, PRICE, & CO.
Battersea.—New-rd., the Projectile Company's Works, area 2 a. 2 r. 8 p., u.t. 67 yrs., f. 310l., with goodwill, plant, &c., as a going concern. 75,000
By NEWBORN, EDWARDS, & SHEPHERD.
Edmonton.—54 and 56, Silver-st., f. c. r. 83l. 1,420
Kensington.—Crescent, f.g.t. 16, reversion in 28 yrs. 130
Edmonton Town.—35 and 36, Torbay-st., u.t. 40 and 33 yrs., g.t. 11l. 510

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Deadline to be delivered.
*Public Baths	Winchester T.C.	£50. and 100. premiums	Feb. 28

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Completing Buck Durham road	Leamington (Durham) U.D.C.	J. H. Connelley, Council's Officer, under order of Durham. G. R. Shaw, Boro' Surv.	Feb. 7
Sewering Bright-street, &c.	Crews T.C.	W. Dyball, Boro. Surv.	Feb. 8
Keeling, & H. T. Street	Aberdeen T.C.	J. T. Dunlop & Son, Ltd.	do.
Pipe Street, Congregational, Torry	do.	do.	do.
Sewage Works, Home-lane, Roch dam	do.	do.	do.
Store and Room at Workhouse	Belmont Union	do.	do.
Three Houses and Shop, Catcliffe, or Rotherham	do.	do.	do.
Three Houses, Commercial, Hav. street	do.	do.	do.
Gasholder Tank	Admiralty	do.	do.
Four Houses, Eaton-road, Hakey	Richman Gas Co.	do.	do.
House, Dunning, N.B.	Dr. Donaldson	do.	do.
Villa, Stan. & Co. Bridge-street, How market	O. Draper	do.	do.
Retaining Walls, &c. Berry, Pomeroy Technical School, Park-street, Hull	Totnes R.D.C.	do.	do.
Warehouse, Low T. Mill, Kingley	Bugden & Co.	do.	do.
Sulphur House, Castle-hill, Ratcliffe	do.	do.	do.
Addit. to Sandhoe House, Corbridge on Tyne	Streifford U.D.C.	do.	do.
Sewage Works, Cook-street, &c.	do.	do.	do.
Sewage Disposal Works, Holmside Village	Leamington R.D.C.	do.	do.
*Works, Services, and Materials (various)	Bathesda Vestry	do.	do.
Block of House, Ewer-street, &c.	Plymouth U.D.C.	do.	do.
House, Tweed-street, Berwick	Municipal Charity Trustees	do.	do.
Two Houses, Barnard-street, Salisbury	do.	do.	do.
Rebuilding "Boat" Inn, Bedford at Plymouth	do.	do.	do.
Painting, &c. Works, Osmen, Town-hall	Rochdale Union	do.	do.
Stables, &c. Quarry-street, Bury, Lancs.	Provision Soc. Ltd., ...	do.	do.
Additions, &c. to Workhouse	Cardigan Union	do.	do.
Residence, Carrigroh, Ireland	Birmingham Corp.	do.	do.
Hastings Kerb, &c.	J. Plant, ...	do.	do.
Additions to National Schools, Oswestry	Admiralty	do.	do.
*Dwelling houses, &c. Dungannon	do.	do.	do.
Alterations, &c. to Chapel, Penryn, W.	do.	do.	do.
Six Houses, Wilbury, Wicks	do.	do.	do.
Three Houses, Empress-road, New-ton, Wrexham	do.	do.	do.
Additions to West Vale Mill, Halifax	do.	do.	do.
Two Houses, Mile Cross Estate, Halifax	do.	do.	do.
Cast-iron Pipes	Hikley U.D.C.	do.	do.
Bridge Improvement Works, Wark worth	Alnwick U.D.C.	do.	do.
Theatre, Abbeville	Leamington R.D.C.	do.	do.
Road metal	do.	do.	do.
Grants	do.	do.	do.
Surgery, Elbow Vale, South Wales	do.	do.	do.
Carriage Bridge, Dursley	Hereford U.D.C.	do.	do.
Granite and Shale (10,000 tons)	Spharic R.D.C.	do.	do.
Porcelain, Keeling, &c. Meadowlands New Road along River Trent	Leamington Corp.	do.	do.
*Services and Materials (various)	Leamington Vestry	do.	do.
Farm, Daviot Branch, Argyll	do.	do.	do.
Wards and Offices, Workhouse	Uckfield (Sussex) Union	do.	do.
Alterations to Shop Premises, Boston Spa	do.	do.	do.
Additions to School, Beckley, Chester	do.	do.	do.
Warehouse, Stabling, &c. Christchurch, Cad. Halifax	do.	do.	do.
Clean room, Offices, &c. at School, near Bury	do.	do.	do.
Bridge Work	do.	do.	do.
Cast-iron Piping, &c.	do.	do.	do.
Alterations to Schools, Tivdale	do.	do.	do.
Theatre, Wellington-street, Barnsey	do.	do.	do.
Mortuary, &c.	do.	do.	do.
Parish Church, Donkeman, near Dun drum, Ireland	do.	do.	do.
Gran to Metal, &c.	do.	do.	do.
Hut-hill Stone	do.	do.	do.
S. & Limestone	do.	do.	do.
Sulphur Work at Workhouse	do.	do.	do.
*Gravel, Limestone, Slag, Gravel, Coal Oil, Ironmongery, Collection of refuse, &c.	Hendon T.D.C.	do.	do.
*Buildings, Walling, &c.	Dartford Union	do.	do.
*Works and Materials	Tottenham U.D.C.	do.	do.
*Cast-iron Pipes	County Boro of Croxson	do.	do.
*Additional Story to Mounting Shop, Shoreditch Vestry	do.	do.	do.
*Wood Paving	do.	do.	do.
House and House, near Workhouse	Blackburn Union	do.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Additions to Hospital, Devises	Wilt County Asylum	C. S. Adge, County Surv.	Feb. 15
Additions to School	Heras Bay Sch. Bd.	E. Collard, Archt. East-street, Heras Bay	do.
Warehouses, Croft Mills, Cowling	G. B. & Sons, Ltd.	J. Harley, Archt. Eborac-buildings, Skipton	do.
*Disinfectants, Works and Repairs, Various Pools, Broms, Ball-t-Wood Bluffs, Urmah, Linc. York	Westminster Vestry	G. R. W. Wheeler, Town Hall, Caxton-street, & W. H. B. Scott, Town Hall, ...	Feb. 15 and 16
*Storehouse Pipes, Traps, &c.	Hove U.D.C.	do.	do.
*Works and Materials (various)	Hamstead Vestry	do.	do.
*Works and Articles (various)	St. Luke's Vestry	do.	do.
*Public Works, &c.	Middleton U.D.C.	do.	do.
Factory Buildings, Offices, Stables, &c.	Schulze Gunpowder Co.	do.	do.
Additions to Offices, St. Michael's road, Southsea	Portsmouth and Union	do.	do.
Vestries, All Saints Church, Notting-ham	do.	do.	do.
*Works and Materials (various)	Hammer-smith Vestry	do.	do.
Sewer, &c. High-street	Chambers R.D.C.	do.	do.
Extension of Grouse Run road	S. Venables R.D.C.	do.	do.
*Wards and Larder, Farm Buildings, Alterations to Offices, &c.	Stoke-upon-Trent Union	C. Lyman, Archt. Stoke-upon-Trent	do.
*Paving	Greenwich U.D.C.	J. C. Otter, U.D.C. Office	Feb. 17
*Sewer, Douglas	St. James U.D.C.	H. Richards, & E. Council	do.
Warehouses, Millbank, Bermondsey-road, London	Northern Co-op. Co. Ltd.	R. G. Williams, Archt. 181A, ...	do.
*School	Frisland (Essex) S.B.	S. T. James, Princeton-on-Sea	Feb. 13
Granary, Avonmouth	do.	do.	do.
Additions to National School, Battle	do.	do.	do.
Rebuilding Uppermill Bridge, over River, &c.	West Hilling C.C.	J. C. Edwards, County Surv. ...	do.
Main Sewer, Sutton Lane, Broughton	Leamington R.D.C.	J. O. Coates, sur. Billesley	do.
Concrete Sewer	Leamington R.D.C.	do.	do.
Knights of St. John, &c.	Bath Sch. Bd.	do.	do.
Schools, Gnost Park-road	North Sch. Bd.	do.	do.
(Steel Ball 12,750 tons)	Government of Victoria	do.	do.
*Services and Materials (various)	Islington Vestry	do.	do.
Schools, Foulton, Barnet	do.	do.	do.
*Five Alms-houses and Offices	Kingston-on-Hull Corp.	do.	do.
Additions to Court House, Llanwrst, ...	do.	do.	do.
Concrete Sewer	Oldham Corp.	do.	do.
*Extension of Middleborough Dock	N. E. Rly. Co.	do.	do.
*Construction of Bridge and Approach and station Buildings, Painsley, near Stafford	Carmarthen C.C.	do.	do.
Stone Bridge over River, Llanwrst, ...	do.	do.	do.
Road, Anley	do.	do.	do.
Farm Buildings, Remshaw Moor, near Tholey	Harragrove Corp.	do.	do.
Additions to Royal Baths	do.	do.	do.
Ten Houses, Rurley-in-Wharfedale, near Bradford	J. G. Black	do.	do.
Levellier, Paving, & Weymouth-road and others	Harragrove Corp.	do.	do.
Business Premises, Dickenson road, Bostons, Manchester	do.	do.	do.
Theatre, St. John's-road, Stockton	do.	do.	do.
Additions to Cocoa Works, Harby-road, York	Rowntree & Co.	do.	do.
Offices, Millbury-road and Hobart-street	do.	do.	do.
Schools, East Hill, Uppermill	Shemfield School Board	do.	do.
Exit Stairs, &c. Peel Mills, Morley, York	do.	do.	do.
"Britannia" Hotel, South Shields	J. Rowell & Son, Ltd.	do.	do.
Three Villas New Road, Llanelli	do.	do.	do.
Additions to Business Premises, near Home-road, Hull	do.	do.	do.
Granary School Buildings, Llanwrst, ...	do.	do.	do.
House, South Church-road, South-london	do.	do.	do.
Four Houses, Darfield, near Barnsley	do.	do.	do.
Block of Shops, Chingford	do.	do.	do.
Laying out Grounds, Walls, &c.	Weddon Parish Council	do.	do.
Reservoir, Kildagbury	Northampton R.D.C.	do.	do.
Kilns, Machine Sheds, &c. Whittles	do.	do.	do.
Sewering, Paving, &c. Berry-street, and others	Brierfield U.D.C.	do.	do.
Extension of Electric Light Station	Burnley Corp.	do.	do.
Re-building "Shades" Inn, Cherry Garden-street, Devon	do.	do.	do.
Block of Houses,	T. O. Neill	do.	do.
Presbyterian Church, Bangor, co. Devon	do.	do.	do.
134 Houses, &c. St. John's, near Aber-tyon Mun	John Lancaster	do.	do.
Stables, &c. Barrow-in-Furness	W. P. Lister	do.	do.
Two Houses, Victoria Park Estate, Bramley, Leeds	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Drainage Works' Foreman	Bethnal Green Vestry	£2. 10s. per week	Feb. 9
*Maintenance of Sewage and Cleansing	St. Luke Vestry	2000. rising to 2300. per ann.	Feb. 12
*Borough Engineer and Surveyor	Derby Corp.	1000. rising to 1250. per ann.	do.
*Work of Works	Tottenham U.D.C.	£2. 10s. per week	Feb. 15
*Borough Engineer and Surveyor	South Shields T.C.	1000. rising to 1200. per ann.	Feb. 21

1941-1942

KNARESBOROUGH—For the execution of private street works, for the Rural District Council. Mr. R. Annakin, Surveyor.
44, Station-parade, Harrogate.—
J. T. Wright, Harrogate Hill, Leeds. £1,545 0 0
F. U. Simpson, 1, 5th St. A. E. E. 1,545 0 0
W. Annakin, 1, 5th St. A. E. E. 1,466 4 6
* Accepted.

LEEDS—For the erection of shop premises, Burmantofts-street, for Mr. Hudson. Mr. J. W. Thackray, architect, 5, Kensington-place, Gathorne-terence, Leeds.—
Excavating, Bricklaying, and Masonry.
J. T. Wright, Harrogate Hill, Leeds. £1,545 0 0
F. U. Simpson, 1, 5th St. A. E. E. 1,545 0 0
W. Annakin, 1, 5th St. A. E. E. 1,466 4 6
* Accepted.

LONDON—For rebuilding No. 18, Old Cavendish-street Oxford-street, W.—
Gosling. £2,933
W. Hall & Sons, Croydon (accepted). 2,973

LONDON—For pulling down and rebuilding the "East of Chatham" public-house, Thomas-street, Woolwich.—
Kirk & Randall, 1, 5th St. A. E. E. £3,350
Mundy & Son, 3, 5th St. A. E. E. 3,350
H. L. Holloway, 1, 5th St. A. E. E. 3,350
Sanford & Co., 1, 5th St. A. E. E. 3,350

LONDON—For making-up Palmerston, Marlborough, Granville, and Pymmes-roads, Boreham Park, for the Southgate Urban District Council. Mr. C. G. Lawson, Surveyor, Council's Offices, Palmer's Green, N. Quantities by Messrs. Lee & Sons, Craven-street, W.C.—
E. & A. J. Nicholls, 1, 5th St. A. E. E. £4,714 0 0
F. U. Simpson, 1, 5th St. A. E. E. 4,714 0 0
F. A. Jackson & Son, 1, 5th St. A. E. E. 4,714 0 0
George Bell, 1, 5th St. A. E. E. 4,714 0 0
* Accepted.

LONDON—For extension of premises at 37a, Kentish Town-road, for Mr. Baldry. Mr. Walter Baling, architect, 7, John-street, Adelphi, W.C.—
Marchant & Hirst (accepted). £2,665

LONDON—For alterations in stables, at various fire stations, for the London County Council.—
Woolwich Station.
G. Parker, 1, 5th St. A. E. E. £1,105 0 0
H. Line, 1, 5th St. A. E. E. 1,105 0 0
* Accepted.

LONDON—For the reconstruction of the Holborn branch of the Fleet sewer, for the London County Council.—
J. H. Neave, 1, 5th St. A. E. E. £12,933 9 1
T. Adams, 1, 5th St. A. E. E. 12,933 9 1
Pedretti & Co., 1, 5th St. A. E. E. 12,933 9 1
F. A. Jackson & Son, Limited, 1, 5th St. A. E. E. 12,933 9 1
* Accepted.

NAVAN (Ireland)—For the construction of water supply works, for the Town Commissioners. Mr. J. H. Swinney, engineer, Avenue Chambers, Belfast. Quantities by engineers.—
High R. Blackburn, 1, 5th St. A. E. E. £6,624
Hegarty & Gask, 1, 5th St. A. E. E. 6,624
Jno. Cunningham, 1, 5th St. A. E. E. 6,624
Chas. J. Quire, 1, 5th St. A. E. E. 6,624
R. S. Baues, 1, 5th St. A. E. E. 6,624
* Accepted.

C.B.N. SNEWIN
MAHOGANY, WAINSCOT, WALNUT,
TEAK, VENEER, and TIMBER MERCHANT,
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,
HATTON GARDEN, and 29, RAY STREET,
FARKINGTON ROAD, E.C.
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The California University Competition.

THE arrangements for this proposed great international competition have now assumed a definite form. The programme and conditions are comprised in a pamphlet of nearly forty pages, issued by "The Trustees of the Phoebe Hearst Architectural Plan," 217, Sansome-street, San Francisco, but of which copies, we believe, can be seen or obtained at the Institute of Architects. It may be useful, however, to notice here some of the main points of the programme.

The competition is for a general scheme for the whole laying out of the ground and arrangement of the buildings, "the guiding thought of the entire undertaking," so that, although the whole cannot be carried out at once, those buildings which are erected from time to time may all be carried out as portions of one great design. The competition will be a double one, Preliminary and Final; the final competition, as usual in such cases, being between a limited number of competitors selected from the preliminary competition. It appears, however, that even the preliminary competition will be a matter of considerable detail, as the "general plan" will indicate all the buildings in detail, and not in block only, to a scale of 100 ft. to the inch. The other drawings will be a general elevation and a general section, to the same scale as the plan. The authors will each use his own judgment as to which points of the design he will take for this section and elevation; and as each competitor is to be allowed full liberty to arrange the buildings and sites as he thinks best, it would be difficult to specify any special line for the section or elevation.

The jury will select not less than ten plans from the preliminary designs, but have power to select more. If only ten are retained, their authors will each be entitled to a premium of 300*l.*; if more than ten and not more than fifteen are selected, the premium will be 240*l.* each; if more than fifteen are selected, 200*l.* each. This arrangement seems rather illogical, from the point of view of the architects, as one cannot see

why any one man should receive less for his labour on account of the proportion of merit in the other competitors; and as there seems to be plenty of money, we should suggest that it would be much more fair and logical to give the same premium to all those whose works are selected for the final competition, independently of their number. The premiums are not, however, to be paid at once; one-third of the sum is to be paid down, and the remainder after the competitor has sent in drawings for the final competition. This is, however, independent of the premiums specially attached to the final competition, for which a sum of 5,000*l.* has been set aside; of this at least 1,600*l.** will be awarded to the plan elapsed as No. 1, and at least five of the final competitors will receive premiums; but the jury retain the right of distributing the total allotment among a greater number of competitors if they think fit.

In the final competition a general plan, section, and elevation are again required, accompanied by a general perspective view, all the three latter, as before, to be taken at any point the competitor prefers. What further drawings may be required will be decided by the jury after the preliminary competition; they may require the competitors to give drawings of one division or set of buildings; to a larger scale, we presume, than that of the general plan, though that is not stated in so many words. We observe also that no statement is made as to the scale to which the general drawings are to be made for the final competition; as far as appears, they are to be the same as in the first competition; but the fact that the scale is not defined appears to be an oversight. The point is of some importance as an indication of the amount of work a selected competitor will have to go through before his chance of ultimate success in the final competition. If the scale for the general plans is to be the same, there does not appear to be any reason why a competitor might not send in his general plans again for the final competition, if he is entirely satisfied with them. In connexion with this point, however, it may be mentioned that a competitor selected in the preliminary competition has full liberty to modify his designs for the final one,

*In the programme the sums are given, naturally, in dollars; we give them here in English currency.

and is not obliged to adhere to his first scheme. All descriptive writing on the plans is to be on the rooms described and not in the margin (a provision, obviously, against the possible waste of time of the jury in referring to schedules and reference letters), and it is all to be in English; no other language will be recognised. For a competition open to all the continental countries we should have thought French would have been more convenient.

The preliminary competition is to be decided by a jury of five architects, viz.: Mr. Norman Shaw, R.A. (London), M. Pascal (Paris), Professor Wallot (Dresden), Mr. Walter Cook (New York), and Mr. J. B. Reinstein (San Francisco). We are rather surprised that the committee did not apply to Mr. Waterhouse to be the English representative on the jury; in that particular function his name, we should imagine, would command more confidence with English competitors (if there are any) than that of any other English architect, more especially as this is a case in which plan is of the highest and most essential importance, and Mr. Waterhouse is a master of plan. For the final competition the jury will be composed of the five members of the preliminary jury, and of four architects who will be chosen by the Phoebe Hearst Trustees, assisted by lists of names proposed by the competitors who are selected in the preliminary competition, each of whom will be invited to send five suggested names, the four who have most votes to be selected, subject however to proper provision for the international character of the jury.

The preliminary designs are to be delivered, not in San Francisco, but to the care of the United States Consul at Antwerp, by July 1 of this year. No date is yet fixed for the conclusion of the final competition, but it is stated that the selected architects will have not less than six months given them to mature their designs; and they will moreover, if they wish to study the site, receive, under certain conditions, first-class transportation and expenses for the journey from their places of residence to San Francisco and return; a provision both liberal and sensible. There is to be no exhibition of the general collection of preliminary plans, but after the final competition the final and preliminary plans of all those who take part in it will be exhibited at

the Mark Hopkins Institute of Art at San Francisco.

The programme has been deposited at various centres in different cities, that for London being the Institute of Architects.

Such is the outline of the arrangements for this very exceptional and perhaps unprecedented architectural competition, concerning which it is difficult to predict whether it is likely to result in a grand success or a *fiasco*. The ultimate prize, for the man who comes out the winner in the final competition, is no doubt a grand one; but the work to be done for even the preliminary competition is so serious that it may be questioned whether many architects who are already in possession of a fair practice will care to go through it for the chance of selection to enter the final competition; for the premiums in the preliminary competition, though they may be thought liberal in comparison with ordinary competition standards, will by no means recompense the work to be undertaken. This will be realised at once when we say that the general plan includes no less than twenty-eight blocks of building, many of which must be extensive and elaborate in plan, and the plans of all of which must be given in as much detail as can be shown on the scale of 100 ft. to an inch. The following is the list of these Departments, the requirements of which are in some cases drawn out at considerable length; we must content ourselves here with merely indicating the principal rooms required in some of the more important blocks:—

1. Administration: Including entrance to the University, offices of the president and secretaries, and for the meetings of regents and professors, reception-rooms, ante-rooms, committee-rooms, hall of records, &c.
2. University Library: For 750,000 volumes, with large reading-room, hall for papers and periodicals, study-rooms, &c.
3. University Museum: Provision for art, antiquities, ethnology, &c.
4. Auditoriums: Two, each adapted to lecture, concert, and theatre purposes, for 5,000 and 1,500 persons respectively, and a garden arranged for celebrations and receptions.
5. Military Establishment: Four lecture rooms, library, museum, gallery of models and drawings of military works, armoury, drill field, &c.
6. Gymnasia: Two large halls for exercises, each with 200 dressing-rooms, and 200 shower baths; two swimming tanks, large field for athletic games, with stands and seats. "treated in a monumental and majestic style."
7. Printing and publishing Establishment.
8. Habitation: for 5,000 students, and for head of the Material Department and family, assistant doctor, superintendents, employees and workmen, &c.; and two dining establishments for students.
9. Club Houses: Four, with all modern appointments.
10. Infirmary.
11. Approach and Communication: Porticos, galleries or corridors, interior staircases, elevators, &c.; covered communications between the various groups.
12. Buildings for the General Service: A central plant for production of power, heat, and light; workshops; telegraph and telephone stations; warehouses; fire department station, &c., &c.
13. The Departments of Instruction in general: Various adjuncts required in all the groups—cloak-rooms, lavatories, department libraries, study-rooms, &c.
14. Department of Philosophy and Pedagogy: Eleven lecture-rooms, twelve laboratories, &c.
15. Department of Jurisprudence: Eleven lecture-rooms, &c.

16. Department of History and Political Science: Fourteen lecture-rooms, gallery of geographical maps, &c.
17. Department of Ancient and Modern Languages: Fifty-four lecture-rooms.
18. Department of Mathematics: Fifteen lecture-rooms and model-room.
19. Department of Physics: Ten lecture-rooms, thirty-one laboratories, with necessary adjuncts, tower for vertical experiments, long gallery for optical experiments, machine-shop, &c.
20. Department of Astronomy: Observatories for astronomy and meteorology, six lecture-rooms, dwellings for three astronomers and families.
21. Department of Chemistry: Three lecture rooms, thirty-one laboratories, and a long list of accessory departments.
22. Department of Natural History: Ten lecture rooms, various laboratories and their accessories, dissecting-rooms, vivisection-rooms, large museum of zoological collections in three sections, microscopical laboratories, herbarium, botanical garden, &c.
23. Department of Fine Arts: Providing everything for the teaching of the Fine Arts; painting, sculpture, architecture, music.
24. Department of Agriculture: Seven lecture-rooms, many laboratories; museum for agricultural products, &c.
25. Department of Mechanical Engineering: This department includes electrical engineering. Eight lecture-rooms; eighteen laboratories; five drawing-rooms; three or four workshops; rooms for collections and models, &c.
26. Department of Civil Engineering: Accommodation similar to last department.
27. Department of Mining: Similar to No. 25; space and accommodations required for this department are about the same as for the Department of Mechanical Engineering; power supplied from central station.
28. Department of Draughting and Graphical Analysis: Nine draughting-rooms, model-room, &c.

Bearing in mind that in the above statement of the requirements for the various blocks we have only given the principal items, and omitted a great quantity of minor detail, it will readily be seen that this is a scheme which no man can adequately consider and sketch out plans for, even on the small scale demanded, between now and July 1, unless he put aside everything else that he was doing and devoted his whole time and thought to this one competition; and is it likely that any man who has a practice and has his living to make by it will abandon all his regular work for the sake of the chances offered to him here? The only people who are likely to go in for it are ambitious young men who have not got into practice, and who have enough to live on to support them while they are engaged in working out the California scheme; so, at least, the probability appears to us; and we do not suppose it was that class of architect which the promoters desired to attract. The promoters, in fact, seem to have been a little bitten with that disease of *megalomania* which is said by Nordau to be a special weakness of the present day; they have desired to have an architectural competition on such a scale as should throw all others into the shade; and they have gone beyond the limits of what is possible to expect from competitors. They should have asked for a block plan of the site, with a sketch elevation and section, and detailed plans of perhaps two of the blocks, as an indication of the author's efficiency in the details of planning. With such a programme they might have attracted some of the most eminent architects from all countries. As it is, we very much doubt

whether they will attract any such men. There may be still time to reconsider the matter and to announce such a modification of the conditions as we have suggested, through the Press, in such a manner that it should come under the eye of all actual or possible competitors; and the Trustees or their professional advisers would probably do well to take this point into consideration before it is too late, if they wish the competition to be a success.

LONDON SOILS AND SUB-SOILS.



ONE of the most useful works that has ever emanated from the Geological Survey Office has just been published.* It treats, in an elementary way, of the general character of the ground in London and for some miles round from a sanitary standpoint, and is intended to be useful to house-hunters, medical officers, engineers, and architects.

Mr. Horace Woodward thus classifies the various geological formations and soils, and tabulates their leading characteristics:—

QUATERNARY.

Made ground and natural soil	.. = Superficial covering of mould and disturbed ground.
Alluvium	.. = Silt, marl, clay, and peat.
Valley or river gravel and brickearth	= Gravel and loam.
Clay, with flints (of varying age)	.. = Clay, loam, and flints.
Glacial drift	.. = Boulder clay, loam, gravel, and sand.

TERTIARY.

Upper	.. = Sand.
Middle	.. = Sand, loam, and clay.
Lower	.. = Sand.
London clay	.. = Clay.
Blackheath (or Oldhaven) beds	.. = Gravel.
Woolwich and Reading beds	.. = Clay, sand, and gravel.
Thanet beds	.. = Sand.

The "made ground" is, "naturally, thick in those parts of the Metropolitan area which have been longest settled upon. At the Bank of England, for instance, it is 22 ft. in thickness; it "is not always an unsatisfactory foundation for a house."

Dealing with the "marshland, or alluvium," the author rightly condemns it for building upon; composed of silt and clay, with peat and occasional layers of marl or gravel, and varying in thickness from 5 ft. to 40 ft., it forms a damp and unreliable foundation. Gravel usually underlies the alluvium, and this is often waterlogged, so that, if the river be in flood, and the alluvium be thin or porous, water may rise in the cellars of houses built upon such low-lying ground. The useful map accompanying the work indicates that alluvium occurs as a broad sheet in the valley of the Thames extending from Bermondsey to Gravesend, but is cut out at Woolwich, Erith, Purfleet, and at Gravesend itself. Most of this silt and mud is on the northern side of the river, though there is a considerable stretch of it on the south side, at Plumstead marshes and Erith marshes. The alluvium extends as a narrow strip up the Thames from Bermondsey to Chelsea, and a great part of Westminster is situated on old marshland. The valley of the Lea for many miles is skirted by the same undesirable formation, and so is the Colne valley from Staines, by Uxbridge, to

* "Soils and Sub-Soils, from a Sanitary Point of View; with special reference to London and its neighbourhood." By Horace B. Woodward, F.R.S. London: Her Majesty's Stationery Office, 1897. (Memoirs of the Geological Survey.)

Rickmansworth and Watford. The author makes a little contradictory in stating that one of the most serious objections to any large population on alluvial grounds is the difficulty of introducing any effective system of house-drainage, owing to the want of fall to carry away the sewage. How about immense parts of the Metropolis built in such situations? Are they not effectively drained, and was any great difficulty experienced in draining them more than is experienced in draining other large cities built on low-lying land, though not on alluvium? Does not the objection raised apply to low-lying land in general, and not to alluvium in particular?

Turning to the next deposit scheduled, the "valley or river gravel," this formation consists of loam as well as gravel, and extends over many square miles to the east, west, and south-west of the Metropolis, besides occupying the central area. It is, in fact, the formation best known to the Londoner, and for the most part lies on the London clay in the area under discussion. Chiswick, Uxbridge, Uxbridge, Staines, Twickenham, Richmond, Fulham, Hammersmith, the City, Hackney, Homerton, West Ham, Daguenham, Tottenham, Edmonton, and Waltham Cross are amongst the districts for the most part built on the "valley gravel." It occurs at low levels near the rivers, and extends to considerable elevation in parts, being 150 ft. above O.D. at Highbury, about 160 ft. at Epsom, and 180 ft. at Wimbledon. Speaking generally, this gravel includes some of the best residential sites in London and vicinity; it attracted the attention of the early settlers, as was long ago pointed out by the late Sir Joseph Prestwich, though the question of water supply probably weighed more with them than any other consideration, the water being obtained then from these gravels. Although Mr. Woodward is favourably inclined towards these gravels from a sanitary standpoint, and in this we quite concur, he issues a note of warning concerning that part of them situated at low levels, unless in such situations the gravel is very thick. When thin, the gravel in the broad low-lying areas is often full of water, and the basements of houses are apt to become damp. We would go further than this, and state that such thin gravels (and, rarely, in places where they are moderately thick) are sometimes impregnated with the remains of sewage and other filth, and are not, under the circumstances, choice spots to build upon. Another factor in the case, which seems important to us from the point of view of health, is that where the thin gravels are waterlogged, not only do the basements of houses tend to be damp, but the atmosphere over the district becomes unduly charged with moisture at times when in other districts it is comparatively dry—the moisture will "hang about" longer over these thin-gravel areas, especially when the bed rests on such an impervious formation as the London Clay. The observations in the last sentence, however, do not apply so much to that part of London which is well drained, and where the rain is to a large extent prevented from soaking into the gravel, but to the outlying suburbs, where the residents must, in consequence, be more careful in selecting a site to dwell upon.

The "brickearth or loam" occurs in small patches in the valley of the Lea at Enfield

Highway and near Ponders End, also at Stoke Newington, Great Ilford, Upminster and near Erith. Two or three occur in parts of Battersea and Chelsea; but large tracts extend from Kensington to Brentford, and again near Hayes and West Drayton, whilst to the north of Shepperton is an ovoid tract some two miles in length. When not too argillaceous these loams are healthy enough sites to build upon.

The "Gravel of Higher Grounds" is found chiefly north of the Thames, and some distance from the City. The greatest development in the area included within the scope of this work is on the other side of the river Colne, from Beaconsfield to Iwer, and by Chalfont St. Peters to Rickmansworth, north-east to Aldenham and North Mimms. Several pieces, are, however, found nearer London, as at Hendon, Hornsey, and Barnet. These gravels vary in thickness from 25 ft. to 50 ft., and range from pebble-gravel or shingle, largely made up of flint and small quartz pebbles, to coarser sub-angular gravel and sand containing, in addition to flint and quartz, many pebbles of quartzite and other stones. So far as the sub-soil is concerned these areas may be highly commended; they are pleasantly situated and picturesque, and it is only where they descend to lower grounds, such as those bordering the Colne valley, that the sites would be liable to damp.

The "Blackheath" beds, being composed of open gravel, and usually situated on the higher grounds of Kent, in the neighbourhood of Woolwich, Greenwich, Bromley, &c., afford excellent foundations on very healthy spots.

The "Bagshot" beds are very local in distribution, but occupy a considerable area beyond Chertsey to the south-west. The "middle Bagshot" is more argillaceous and loamy than the "upper" and "lower," and consequently does not furnish such good sites. A very detailed geological map is necessary to enable one to detect these little differences in this formation.

The "Thanet" sands and "Upper Greensand" form dry tracts south of the Thames; the former extending along North Kent to Epsom and beyond, passing by St. Mary Cray and Croydon; the latter further south as a thin band of little consequence, following the outcrop of the chalk from Otford, near Sevenoaks, to near Guildford. Everywhere they furnish dry and healthy sites for houses.

The "Lower Greensand" is more important as a residential area in Surrey and Kent, extending as a broad belt from Reigate to Sevenoaks and beyond. The formation consists of loose sands, consolidated here and there into hard bands, and varies in thickness from 250 ft. to 400 ft. It occurs below the high scarp of the North Downs. It is famous for its dry and healthy soil and salubrious air. The only drawbacks in the Lower Greensand areas are the proximity of the Gault Clay and the Atherfield Clay, and sites should be selected as far away from the outcrop of these as possible—at least, that is our view.

The "Woolwich and Reading" series and the "Clay-with-Flints and Loam" form mixed soils about which it is not possible to give much definite information. They vary in character according to the precise locality. The Woolwich and Reading are extensively developed in the neighbourhood of Greenwich, Woolwich, Bromley, Croydon,

Orpington, and to the east near Swanscomb and Gravesend. Here a gravel, there sand, occasionally loam, and sometimes pure clay, it is impossible to map the innumerable variations in short distances, and nothing short of actual investigation on a selected site can determine the precise nature of the beds. In regard to the "Clay-with-Flints and Loam," these are irregularly distributed over the chalk downs running east and west from Caterham, and occupying considerable areas. Such ground is doubtful, although Mr. Horace Woodward tells us that, generally speaking, it may be regarded as dry and healthy. This, however, is only because the clay is in an elevated position, and breezes help to dispel the moisture which would otherwise accumulate. We may point out that this is all very well when the "Clay-with-Flints" is near the edge of the chalk escarpment; but when some miles away from it the breezes are expended and the situations, as we know from experience, are by no means as "dry and healthy" as the author would have us believe.

The author says very little about the clays of the neighbourhood of the metropolis; the London clay which underlies the superficial Quarternary beds is a stiff brown clay at the surface, and becomes blue on being dug into. It retains moisture for a great length of time, but is much to be preferred to thin beds of gravel on clay, from a hygienic point of view. At the same time, the author does not mention the disadvantages accruing from instability of foundation, not even in that section, "Clay and Gravel Sub-soils," in the chapter on "The Sub-soil, with reference to Sites and Foundations for Houses," though a word or two is said (p. 30) concerning buildings on the brows of clay slopes. The expansion and contraction of the clay during wet and dry weather respectively has the effect of causing ugly cracks in the walls of many buildings, even those built in a substantial manner.

The "Boulder Clay" is better from the point of view of secure foundations, but agrees with ordinary clay in affording damp situations unless on breezy heights and in the presence of good drainage. We need not deal with "Gault" and "Weald Clay," which present practically the same features from the sanitary standpoint as the London Clay.

We quite agree with the author that the Chalk, with the exception of its lowermost portions, forms nearly everywhere a dry, healthy surface, as rain sinks readily into the ground. It constitutes admirable sites for building, though but little use for garden and plantation purposes.

The chapter on "Water Supply and Drainage" is an old tale, and contains nothing new so far as we can see; the remainder of the book deals with the meteorological aspects of the surroundings of a house, and with sites for cemeteries—a fitting subject for the conclusion.

Speaking generally, we must caution the reader against putting too much reliance on the coloured map attached to this book. The author has, of necessity, had to draw very largely from other publications for his information, and the map is only a geological map in disguise. And a geological formation is rather identified by its organic remains than by lithological characters—the essential characters from the hygienic aspect. When we see the formations denoting "sands, pebble-beds, and clays" blocked in

by one tint (*e.g.*, Blackheath, Woolwich Reading, and Thanet beds), and "sand and pebble beds with clay and loam" (Bagshot beds) by another, and so on, we begin to understand that although the tinting in this map is not that usually adopted by the Geological Survey, yet, rightly understood, we may get the same information from a "Drift Map" of the Survey, published some years ago.

Nevertheless, we will not attempt to sound a discordant note, for, as we said at the beginning, this is a good and useful book; it is intended for the public, and the Geological Survey will find that the more publications of a similar character they issue from Jermyn-street, the more willingly will an indulgent public grant the pittance the Survey receives from the Treasury, a pittance even that has been hanging in the balance lately, unless we are mistaken. We congratulate Mr. Woodward on his book, and the Director-General on the change of policy—one that has been advocated in the *Builder* for some years past.

NOTES.

Excavations at Delphi. The last issue of the "Bulletin de Correspondance Hellenique" (January, 1898), contains the long-looked-for plans of the precinct of Apollo at Delphi, the excavation of which is now completed. As we propose to reproduce the plan, and discuss it in full in a later number, we will now only draw attention to its appearance. The preliminary plan we published, June 8, 1895, is now completed, and, indeed, superseded. The entire precinct covers an area of 20,000 metres (between four and five acres); the complete circuit of the peribolos wall is made out, its masonry in some parts in fairly good preservation. Since our notice nearly three years ago not only has the temple been cleared out, but the great altar at its east front has been laid bare, and not far from it a large omphalos, covered with fillets in marble, has come to light. The complete course of the Sacred Way is made out, and many a vexed question of topography settled for ever. With Pausanias in hand it is possible now to make out the main outline, and follow many of the details of his description. The work of the French excavators is, however, not yet complete. The outlying parts of the city of Delphi still remain to be examined—the portion round the fountain of Castalia, the Gymnasium, the Temenos of Athene Pronaia, the Synedrion of the Amphictyons, and the suburb of Pylaia, all offer promising fields, and all will be the object of at least tentative exploration.

Versailles. The Commission des Monuments Historiques has been visiting in detail the work carried out at the Palace of Versailles and the Trianon, under the direction of M. Marcel Lambert. The Commission seem to have come to the conclusion that the architect has made it his aim to restore the existing constructions in the style of their period and "en s'inspirant des meilleurs documents"; words which suggest the conclusion that a great deal more of "restoration," in the wrong sense of the word, has been going on at Versailles than people in this country were aware of. It has been thought necessary to pull down some subsidiary buildings which were in a state that threatened

collapse, but we are assured that in rebuilding them as much as possible of the old material has been utilised. Further repairs are still necessary to the attics of the two wings and the large galleries of the first floor suite. It is desired, we are told, to have everything complete by the year 1900, in order to present visitors, we presume, with a spick-and-span new Versailles at the exhibition year. Mr. Fulleylove and other artists who rejoice in painting old buildings had better get all they can out of Versailles before it is polished out of recognition.

THE Board of Agriculture have drawn up and issued a scheme, pursuant to the Metropolitan Commons Acts, 1866-78, respecting Harrow Weald Common. The common is to be regulated and managed by a body of Conservators who are charged with its preservation, drainage, planting, and the like, and who will frame a set of by-laws to prevent nuisances, encroachment, ill-usage, or undue interference with public use for purposes of recreation and exercise. The Metropolitan Public Gardens Association are making improvements at St. Nicholas churchyard, Deptford, and the Jewish burial ground in the Fulham-road, at the corner of Church-street. The last-named has served for the Westminster congregation of Jews, and an inscription in Hebrew and English, set over the entrance, states it was established in 1816. Just opposite stood, until 1848, the Queen's Elm turnpike, named, it is said, after a tree beneath which Queen Elizabeth took shelter from a shower when walking with Lord Burleigh, who lived at Brompton Hall. The tradition may have some substance in fact, inasmuch as "the Queen's tree at the end of the Duke's-walk," by this spot, is mentioned in the Chelsea parish records, 1586, and in 1687 the highway surveyors are amerced five pounds for not sufficiently mending the highway from the Queen Elm to the bridge, and from the Elm to Church-lane. The cross-roads were afterwards known as "Nine Elms" from the trees planted by one Bostocke around the older one; Elm Park-gardens, about 200 yards distant, have been laid out over the site of Chelsea Park (once the property of Sir Thomas More and of the Marquis of Wharton), where, *circa* 1720, John Appletree established a mulberry garden for rearing silkworms. The Association are engaged in laying-out York-street, Walworth, disused burial ground, and in renovating that of St. George-the-Martyr, Southwark, and, we understand, will shortly proceed likewise with St. John's churchyard, Hoxton, together with Charles-square, Hoxton, and Albion-square, Dalston. We read also that the London County Council propose to acquire for 6,000*l.* a plot of 1½ acres in Grace-street, Bromley, E., and agree to take over and maintain Spitalfields churchyard, as laid out by the Association six or seven years ago.

A CORRESPONDENT of the Times A Patent Court, who signed himself "Practitioner" has suggested that in order to prevent the trial of actions in regard to patents from blocking the way for general litigation in the Chancery Courts, there should be established a court for the trial of patent cases only, in other words, that a judge should be appointed for the purpose. We have more than once urged

the same view, not for the purpose of lightening the general cause lists, but because it is perfectly obvious that it would be more satisfactory that patent actions should be set down before one judge, who would be thoroughly accustomed to this character of litigation. Further, he should have the assistance of an assessor or assessors, so that a great deal of the expensive and elaborate evidence of experts which is now employed, to educate the judge in his subject, so to say, could be dispensed with. There must always be a certain amount of expert evidence, but under the present system it is too extensive and too costly. We should be inclined, also, to say that actions for the infringement of light and air might very well be assigned to the same judge. The more litigation is classified and systematised the easier does the judicial machine run, and the greater is the convenience to suitors and all interested in law suits.

THE paper read on Wednesday to the Institution of Electrical Engineers by Mr. Cowper-Coles, on an electrolytic process for the manufacture of parabolic reflectors for search lights and similar purposes, is interesting, as it describes an important industrial application of palladium. This metal, which has a bright silver-white colour, has hitherto only been occasionally used for coating silver articles to prevent them from tarnishing. It is an expensive metal, being at present twice as dear as platinum by weight, but bulk for bulk it is the same price. Mr. Cowper-Coles builds up his concave reflectors electrolytically, the backing being of copper silvered in front, and then a small quantity of palladium is deposited on the silver. They have been found to withstand excessive heat without tarnishing. Salt water thrown on them when hot has not damaged them, the water being driven off as steam and the salt left as a white deposit which could be easily removed by a wet cloth. A reflector recently tested at Portsmouth had a number of rifle bullets passed through it without affecting appreciably its efficiency. Mr. Cowper-Coles said that silver was quite unsuitable as a reflector for the light of the electric arc, as it rapidly tarnished, and there was a consequent falling off in the intensity of the reflected beam; whilst palladium, although not quite such a good reflector as polished silver, was very suitable, as it was practically unaffected by the heat of the arc and by exposure to the atmosphere. A photograph of the image of a wire grating in one of his reflectors showed hardly any distortion of the wires, and proved the true parabolic nature of its surface.

Sanitary Work at Paddington. The case of Barnes v. Scantlebury, which was tried last week, reveals a state of affairs at Paddington in regard to sanitary matters which is most unsatisfactory. It appears that the owner of a house agreed to do certain sanitary work for a tenant. The agents for his property were Messrs. Hunter and Hunter, one of whom was a member of the Paddington Vestry. These agents employed a builder who was also a member of the Vestry, and the son of this builder was the Sanitary Inspector of the district. As Mr. Justice Wright said, "such a state of things was a reproach to the whole

system of local government, and was calculated to lead to abuses and scandals." As regards the case itself, the defendant admitted that the work was not properly done, though it had been passed by the sanitary inspector. It is clear that a sanitary inspector of a district ought not to be a relative of any builder or contractor in his district. He should be a person selected from another part of London, or from outside the Metropolis altogether. We also are of opinion that no contractor or builder who is a member of a vestry should be allowed to take contracts for work which has to be executed to the satisfaction of an officer of his vestry. It is clear that otherwise the official cannot bring to bear the unbiassed mind which is desirable. If a builder wishes to take part in the business of a vestry he should be content to do work which has no way to be approved by the body of which he is a member.

In Dr. G. S. Buchanan's report to the Local Government Board upon the causes of an outbreak of enteric fever at Wadebridge, in the rural District of St. Columb Major, Wadebridge, is described as "a little town commercially well to do, and promising to grow in the future owing to increased facilities of railway communication," but in a very unsatisfactory state as to buildings, drainage, and water supply. All but a few newly-built houses are without damp-proof course, and many are damp in consequence. The old so-called "sewer" leading directly to the river, locally termed a "stone sewer," is a mere channel below the surface of the roadway, the floor being earth or rock, with sides three or four courses of stone, apparently put together without mortar, cement, or concrete, while large flat stones form its roof. Other "sewers" of similar construction are to be found elsewhere in the town, but their position is usually quite uncertain. The soil pipes of the few water-closets in the place are believed to be led to neighbouring drains, which discharge their contents into one or other of the "stone sewers." The majority of the dwellings are served by privies in their yards or gardens. There is no system of public scavenging, and no bye-laws imposing upon householders the duty of periodically removing excrement and refuse. Frequently they deposit it by a neighbouring road-side, and thus nuisance arises. The water supply of the town is derived from wells, said to be sunk usually 20 ft. to 30 ft. in the rock. "Craig's Well," one of the five public wells, has a depth of 25 ft. For a few feet below the ground level it has a steining consisting of courses of stone, not cemented together, and permitting leakage into the well from the surrounding soil; the remainder of the well-shaft has no steining, the wall of the well being formed by the rock of the place. These wells furnish an uncertain quantity of water, and from the general statement as to the methods of drainage, &c., above referred to, it is not difficult to understand, as Dr. Buchanan observes, that the wells are "exposed to numerous risks of pollution."

The exhibition of the "Cercle de l'Union de l'Union Artistique," opened in Paris on Monday last, is at least equal in interest to that of the Cercle Volney. Some of the numerous portraits

are of the first order, especially the remarkable one of M. Hanoteaux, the Minister of Foreign Affairs, by M. Benjamin-Constant, and that of Mlle. Rose Caron, which is one of M. Bonnat's best works. M. Roybet continues to paint the portraits of well-known artists in sixteenth-century costumes. The portraits of young ladies by M. Aimé Morot and M. Chartran, and those of children by M. Carolus-Duran, are also among the main attractions of the exhibition. M. Detaille exhibits a picture which is a remarkable example of his special talents and historical knowledge; it represents the French outposts during the war in Italy in 1796. Among works in *genre* may be mentioned a fine picture by M. Cormon, and a "retrospective" view of the Paris quays by M. Georges Cain, the curator of the Carnavalet Museum. Among the sculpture exhibited is a terra-cotta by M. Puech, "La Fidélité enchaînant l'Amour," and some works by MM. Gérôme, Crank, and Mercie.

The Society of Medallists.

THE Society of Medallists is a new organisation which is now holding its first exhibition at the Dutch Gallery, 14, Brook-street. The collection consists chiefly of medallion portraits and small bas-relief subjects on the same scale, together with some silver-point portraits and other drawings. There is perhaps no medallion work that is of the first order of interest; there are, however, some very pleasing works both in portraiture and ideal heads; among these may be specially named Mr. Drury's "My Queen," a bust in profile, Mr. McGill's "Design for a Medal and Reverse," and Miss Margaret Giles's "Two Medals." Perhaps the best thing in the room, however, is not a medal, but Mr. Legros' silver-point portrait of the Duke of Devonshire, of whom the same artist has also executed a medallion portrait, for which this drawing was perhaps a study; but the medal is hardly equal to the drawing. The exhibition, however, is a distinct addition to the smaller exhibitions of London, and it is to be hoped that it will succeed and develop further. In the art of the medallist we are far behind the level of the best French work of that type, and an impetus to the development of art in this country is much needed.

THE ITALIAN RENAISSANCE.*

BY PROFESSOR AITCHISON, R.A.

THE misfortune of the Renaissance architects was that they could not make their architecture progressive, and we may well ask how it could be expected. They were neither architects nor constructors; they were literary men, craftsmen, and artists who sought to bring to life again deceased Roman architecture; but we owe them, as we owe the humanists, an overwhelming debt of gratitude. The humanists rescued the Greek and Roman classics for the instruction and delight of posterity. These craftsmen and artists rescued innumerable remnants of antiquity, and some at least of the classic methods; they not only gave greater beauty and perspicuity to their work, but showed how stateliness, dignity, and majesty could be impressed upon it. To sculpture, at least, they gave a new soul, and they brought painting to a perfection that then did not exist, and which has not since been surpassed. They gave, too, a sort of canon of beauty and dignity to architecture which it should strive not to fall below. Where the Renaissance artists failed was in not seeing that architecture was both a structural and a

progressive art; that it had to meet new wants, both material and spiritual, and an immense accession of knowledge. They not only left a bitter drop in the cup, but that bitterness was rank poison, fortunately not mortal, but producing stupor from which we are only now beginning to awaken.

The Renaissance artists were enthusiastically patriotic and did not see why if they could equal or surpass the Romans in the visual fine arts, they might not bring back Roman power. Architecture with them had no proper basis as structural art, for as a structural art it could only progress by construction, and ignoring all the progress made by the Gothic architects they fell back on the Roman construction of a thousand years before. But, omitting these fundamental errors, we must not be ungrateful for all the masterpieces they left for our admiration and instruction. We must consider what the people were when the Renaissance began, and what it was. The people amongst whom it sprang were of exceptional vigour of mind and body, and with a belief that there was nothing they could not do, and with a desire to know and do everything, and with a genius, an energy, and an untiring perseverance that astonish us; and which we, alas! do not possess. Those of you who have read Count Baldassar Castiglione's "Courtier" see the ideal men of those days—men who excelled in every bodily exercise, who were polite, and accomplished in all the fine arts. One has never met such men in our day except, perhaps, the late Lord Leighton. Every one has heard of those great artists of the Renaissance—Alberti, 1405-72=67; Leonardo da Vinci, 1452-1515=63; Raphael, 1483-1520=37; and Michelangelo, 1475-1564=89; all but Raphael and Michelangelo were worn out with work and care just after middle age. Vasari tells us that a man studying art who was not ready to sacrifice his food and sleep could not be said to have a passion for it. The Renaissance was like a man awakening from a lethargy, and suddenly desirous of again using every power of mind and body to its fullest. At its beginning it caused a passion in the people to rival the visual fine arts of the ancient Romans, and when they had rivalled or out-rivalled them, there was not much more to do in that direction; but as it was as well the striking off the fetters from men's minds and leaving them free to pursue whatever they liked, there was everything to do in other directions; all the world was again opened for the display of their energies, for their investigation, for their delight.

The mere invention of printing by movable type, supposed to have been found out in the first half of the fifteenth century, was a great epoch, as the hoarded knowledge and wisdom of the world could then be disseminated; and men's minds were then so activated that they tried, not only to surpass every work of fine art that remained, but to prove and to investigate everything. In the second half of the century Columbus discovered the West Indies and South America; in the third quarter of the fifteenth century, copper-plate engraving was discovered. In short, in the fifteenth century there was a new stir in men's blood. Copernicus, born in 1473, had his doubts about the earth being the centre of the universe, and published his book on his death-bed in 1543. Galileo (1564-1642) proved that the earth was not the centre of the visible universe but merely a minute planet in the solar system. This does not seem of great moment to us, but the clergy saw how momentous it was to them, and foolishly tried to stop the promulgation of an ascertained fact. Man's earth sank from being the centre of the visual universe to be an insignificant satellite of the sun, and therefore man as its inhabitant also sank in a proportionate degree. The finest intellects then became more eager to explore nature and discover her laws than to distinguish themselves by carving lovely statues, painting beautiful pictures, or by building charming or impressive buildings. Alberti had written a Latin play so well that he passed it off on scholars for an ancient one. Michelangelo had carved a statue that the best judges mistook for an antique one. Palladio boasted that his Basilica was equal to anything the Romans had done, and there were several painters who were the first in the world.

Besides the first architectural Renaissance at Florence, which mainly proceeded from the Florentine masters, there was another Renaissance at Venice, mostly by Lombard masters, or from those of the Alps of Bergamo, and

* Being the second Royal Academy lecture on Architecture this Session. Delivered on Thursday afternoon, February 3.

their Renaissance buildings have a much stronger flavour of Byzantine than those at Florence. There was a whole family of the Lombardi who, like the du Cerceaus of France, have been so greatly mixed up that it is difficult to say to which of them to attribute the buildings. The Cavaliere G. Boni, who lived so many years in Venice, is descended from the family of the Bons who built the Gothic part of the Ducal Palace, the Porta della Carta, and the Ca' d'Oro: he has at least settled the name and date of one of them, Pietro Lombardo, who built the church of Madonna dei Miracoli. The corner stone was laid in 1481, and it was finished about the end of 1489. Its exterior is simple and charming, particularly the turret and choir, and its interior is most beautifully designed and carved; a book of photographs, with an introduction by Cavaliere G. Boni, is in the Institute library.

The outside consists of two stories. The entrance front has a podium that breaks round the bases of the six panelled Renaissance pilasters which support an entablature, and in the middle bay is the doorway. This is marked by a projection and by arabesques in the panels of the pilaster outside the door case. The doorway is crowned with a segmental pediment, the fillet of whose cornice turns up at each end, and is formed into a circular patera. The lunette contains Madonna and Child, with a tablet inscribed "Pyrgoteles," the name assumed by the sculptor Zuane Zorzi. On the first floor above the ground floor cornice is another podium on which stand six Ionic partly-fluted pilasters, supporting four semicircular arches at the sides and an elliptical one over the doorway. All five nearly touch the soffit of the upper entablature, whose frieze is ornamented with roundels of porphyry, with carved arabesques between, and is crowned with a cantilever cornice; the pediment is semicircular, there is a rosette at each angle and two on the top, on which stand figures, and in the lunette of the pediment is one central circular window and three small ones on its vertical and horizontal diameters, alternating with circles of inlaid work. The whole of the fronts are of marble, panelled by rails and stiles of darker marble, and with inlays of porphyry, and in the spandrels of the upper arches of the entrance front and of the flank are half-length figures in bas-relief. The simplicity of the composition and the admirable grouping of the choir with its dome and turret, the beautiful colour of the weather-stained marble, and the admirable execution of the sculpture, renders this Renaissance church one of the gems of Venice.

The plan of the church is simple. It has a nave with a gallery over the entrance for the nuns. At the choir end the floor is raised and reached by a flight of fourteen steps, like the Basilicas of St. Miniato at Florence and St. Lorenzo outside the walls of Rome, only here the single staircase is in the middle, while in the two former there is one on each side. The raised part is protected by a balustrade in front and on either side of the staircase, and from the front balustrade the ambos project, nestling against the walls of the nave, beneath the ambos are doorways, at the level of the nave, to the sacristy. On the upper floor, where the choir recedes, is a step; the altar is surrounded with a wall with pierced panels. Over the nave is a semicircular wooden ceiling carved and panelled; the carving is gilt on a blue ground, and some of the larger panels hold pictures. The choir is domed on pendentives. The whole of the walls of the church are lined with marble inlaid or carved; the scrolls, arabesques, and capitals are of pure Roman design, with griffins, chimeras, and dolphins superbly carved, and the pierced marble panels of the enclosure to the altar are marvellous. The pilinths of the pedestals of the pilasters that mark the entrance to choir and support the bit of entablature and the archivolt, are some distance above the floor and are carved with children or Cupids riding on the tails of mermaids. The whole, as far as the design of the ornament is concerned, reintroduces Roman symbolism, though doubtless the dolphins and tridents point to the Venetian power at sea. The Roman eagle is repeatedly introduced, while flying cherubs have been caught by their hair getting entangled in the scrolls. In one of the friezes even bullock-skulls are introduced, and goat-footed satyrs dance on a patera supported by a half-length nude figure springing from foliage. The interior is unique and superb.

It seems to me that it will be better to follow the early Venetian Renaissance, which,

though much later than the Florentine, is to me earlier in sentiment, than to mix up the whole into one inextricable muddle. It is by no means certain that the early Venetian Renaissance got much of its inspiration from Florence, though it is impossible to say it did not. At any rate, we may say that the Renaissance was in the air. At Venice, too, the early architects seem to have been sculptors.

I do not know if the Palazzo Dario was the first example. It is, of course, attributed to one of the Lombardi. It has the simplicity and the artistic sentiment we all so much admire, but with traces of Byzantine influence, and I do not think there is a straight line in it, either vertically or horizontally. Its front is wholly of marble. The circular-headed entrance doorway is about the centre of the ground floor, and in the middle of each side there is a circular-headed window in an oblong panel; the arches are supported by pilasters, with large roundels of marble or porphyry in deep ornamented frames on each side of the windows. At the left angle, looking at it, is a Doric pilaster supporting a shallow entablature. Over the lower entablature is a sort of panelled podium, with seven roundels, one in the middle of each panel; to the left there are four arched windows springing from columns and pilasters, the fourth being over the doorway; and one window in the right corner, which is repeated on the flank, leaving a wide piece of wall, in the centre of which is a large roundel with twelve smaller roundels in a guilloche a border, and this is practically repeated in the two upper stories. The palace is capped by a modillion cornice supporting a tiled roof. The only other feature when I first saw it was a balcony on cantilevers on the second floor, with wrought-iron petticoat balusters. This palace was possibly one of those that Philip de Comines noticed as being adorned with great pieces of porphyry.

The front of the Scuola di San Marco next the Piazza is about 90 ft. long, the portion next the canal is about 50 ft. long; horizontally it is divided by pilasters into six divisions, the two doors being in the centre of the second division from each end; the space allotted to the grand doorway is about seven-fifths of its side space, while at the other end the space allotted to the doorway is about eleven-twelfths of the side spaces; vertically it is divided into two heights by the entablatures, but looking at it the left or canal end has a tall blank attic, with a semicircular pediment, flanked by two side structures, about half the height of the middle one, with semicircular heads. The right-hand part of the front has three semicircular gables only, above the crowning entablature. On the ground floor there are no openings but the two doors; on the first floor there are two windows on either side of the door canopy, and the space over the door canopy is blank; in the right portion there are two narrow windows with triangular pediments on each side of the door space, which is also blank, but has a carved lion's head in a circular medallion, with four circular porphyry plaques on its axes. On the ground floor all the spaces between the pilasters not occupied by doorways have architectural perspectives in low relief. The superb canopied doorway is unique in its perfection. The canopy runs up into the blank space over the doorway, whose plainness contrasts so well with the richness of the canopy, with its fringed edge and finial of Madonna and Child. This canopy covers a lunette, in which is a bas-relief of a saint surrounded by monks, having his hand kissed by one of them; this, with an arabesqued frieze and the carved capitals, forms a rich feature, well contrasted by the plain marble shafts of the columns, while the richness of the upper part is echoed at the bottom by the carved drums of the columns and the carved pedestals. I fear I should only weary you if I pointed out all the aesthetic devices of this front. The design may be said to be full of faults. The large windows are not altogether happy in proportion, and those at the other end are pinched; the making a second band between the capitals deeper than the frieze is more or less a mistake; and the small doorway is squat; but the whole front is so original, so striking, and so full of artistic graces that perhaps for its size it is the best bit of Early Renaissance architecture in Italy. The front is not so faultless as the great Communal Palace at Brescia, but it is much more original and less dull, and has infinitely more artistic devices of composition. We can only compare it with Bramante's end of Sta. Maria

delle Grazie at Milan, and Bramante had many advantages in the shape and size of his church that the other artist had not.

Most of the Venetian palaces had the centre on the first floor kept as a long gallery for walking in, called *la camminata*, mostly with light at each end, the side portions being devoted to the living rooms, and the palace was mostly finished by a cornice, on the top of which was the tiled roof; the front was mostly flat, so that there was a difficulty in getting any variety of shape. This has been got over very admirably in the Cornaro-Spinelli Palace by variety in the shapes and projection of the balconies. On the first floor the *camminata* is lit by the grouping together of two doublet windows, the arches standing on columns, with a tinge of Gothic in the tracery. The side windows of the front are single doublets, divided from the centre window by piers, and with a pier at each end flanked by an angle pilaster; the centre balcony is carried on cantilevers, and has delicate double-belled balusters with narrow pedestals between. The two narrower balconies to the end windows are trefoil-shaped on plan. On the floor above the end balconies are straight and project on cantilevers, while the middle window has a flush balustrade. The ground floor is curiously though charmingly managed; the central doorway is arched and enclosed in an oblong recess, with a narrow and slightly-projecting cornice over it. This floor has small rusticateds, and three narrow windows in oblong panels. On each side of the door two windows re on a lower level, one close to the pilaster and the other to the doorway, while just under the cantilevers of the trefoil balconies is another small window in the middle line between the lower ones, and, as you see, irregularly placed as regards the window above; the lower windows stand on a continuous pedestal with a top and bottom torus, between which it is sculptured with rosettes and festoons. This lower story would be looked on as a terrible solecism by the later architects, who had got the Roman rules and the Roman dullness, but to those who love native originality and waywardness it is delightful, and the smallness of the windows enhance the size of the palace.

The Palazzo Manzoni is much the same as this, but larger, and, I think, a trifle later and more regular. This palace was once bought by the poet Browning.

The Vendramin Palace is immense, treated much in the same style as the two former, but the two upper stories are treated with columns, and I should think it was later than the Cornaro-Spinelli, it has neither the waywardness, the variety, nor the same delightfulness of proportion, and while the Cornaro-Spinelli has the Late Gothic pear-shaped tracery, in the Vendramin the tracery is much heavier and the part of the spandrel below the circle is left solid and carved. Between the coupled columns marking the wings are plain medallions in a frame, one on the first floor, and a lion's head in a shell or basin on the floor above, hung from a ring by ribbons, with floating ends and a female head below it. The frieze of the crowning entablature is ornamented with eagles over the columns of the wings, with a coat of arms over the middle of the windows, and vases over the columns of the centre.

The church of San Zaccaria, attributed to Martino Lombardo and to Antonio de Mano, is one of the most striking Renaissance churches at Venice, and though it has a touch of the Middle Renaissance, there is more invention and originality about it than is commonly met with in the edifices of this period. On the ground level there are no openings except the central doorway; the entablature is supported on two Corinthian pilasters at the doorway, and on the buttresses which it breaks round, and is carried right through the front; over the entablature is a semicircular pediment to the door, with patera, &c., at the top and bottom, out of the junction with the line of the pediment and the patera honeysuckle springs. On the top patera stands a pedestal, on which is a large-sized figure of San Zaccaria. The rest of the lowest story consists of four buttresses, one on either side of the doorway, and one at each angle, and these, with the whole of the ground story, are panelled in squares; the centre space between the buttresses has got one large panel in the centre, the angles of which run in to the side panels, and this central panel is internally surrounded by Cupids bearing festoons. The centre is divided into two panels, with shells

containing busts; the next story consists of an arcade of narrow arches, with shells in their heads. There are single blank arches on the face of each buttress, and the side spaces have similar arcades, the two central arches of which are windows. Above these is an entablature, and on the entablature, which breaks round the buttresses, coupled composite columns are supported on pedestals. The centre or nave space has a triple arcade, with four pilasters in the centres of the piers between the windows, and the same feature, but with a single arched window, is repeated over the sides. These composite columns and pilasters support a very deep entablature, and from the centre of the cornice of each angle buttress springs a quadrant of a circle, the cornice of which is carried right through the front of the nave. In this case the two buttresses are ornamented with coupled projecting piers, while there are circular recesses in the quadrants. The space in front of the nave is divided into four arcades, the two outer ones blank, the two middle ones windows; on the floor above these quadrants, and going right across the face of the nave, are coupled columns, two over each buttress below, and three piers between them; at the back of the coupled columns is an arcade of four arches, the two centre ones forming windows, and the two outside ones being blanks. These columns also support a deep entablature, which breaks round the buttresses and has panels in the frieze. The whole is crowned by a deep semicircular entablature forming a pediment, and on the scrolls at the side, and on the top of the arch are figures, one being a figure with a cross, the other an angel, and the top one on the centre appearing to be an angel with a helmet, whose crest is turned into a weathercock. In the lunette is a circular window, deeply moulded. This front is one of the most original and striking in Venice. It has all the appearance of a new Renaissance front to a Gothic church. The whole composition is original and striking, and full of artistic devices, the top central portion standing alone with its immense central pediment, and being tied at the foot to the main body by the quadrants over the aisles. The two lower stories are kept broad by the slight projection of the panelling on the ground floor and the arcing on the first floor. The central doorway gives a good depth of shadow, and composes with the double windows to the aisles on the first floor, while the long vertical lines of the first floor arcing contrasts well with the square panelling beneath. The semicircular pediment of the door with its figure prevents the seven blank arcades of the nave from being monotonous. On the second floor the bright lights made by the columns contrast well with the dark windows, while the central parts of columns and windowed arcades is in striking contrast with the nearly blank space below.

The lowness of the floor above gives size to the higher floor beneath. The top story, with its coupled columns, has a certain lightness about it, while the deep shadows of the central pediments give a due weight to the top and bring the whole mass together, and the darkness of the central circular window in the lunette gives additional vigour to the top, and, with the figure of San Zaccaria, affirms the central line of the whole front. The outline is made playful by figures at the base of the quadrants and at the base and on the top of the vast semicircular pediment.

I must not omit some description of the Certosa at Pavia, which was a Gothic monastery refounded in Renaissance days. This front has generally been highly praised, but whether from the difficulties of the old front, or from the various architects employed, it is perhaps one of the worst composed buildings in Italy, although most wonderfully ornamented. The large windows of the ground floor have their lints supported by a sort of candelabrum column, from which spring two arches, the windows have wide architraves with a deep frieze over, and a cornice and definite sculpture above, which gives the idea of a pediment. These are separated from one another by piers and buttresses with niches full of figures, and leave a wide central space for the doorway. Unhappily, the doorway, which consists of coupled columns supporting a deep entablature, and joined together by an arch with a rectangular structure upon it, has no architectural connexion with any other part of the buildings, and looks as if it had been removed from a palace and put on to the front. Just above the top of this structure and forming a cornice to the but-

resses, is a flattish string course, with a solid balustrade above and the wall above that arched. Over the doorway is a triple window. On the story above this and over the triplets, is a large square projection, crowned with an entablature and pediment, and in the centre is a large circular window, with an enriched frame; but this also, like the door, has no connexion with any other part. On either side of this centre bay, and clear of the buttresses, is a semicircle, the archivolts of which is partly cut by the buttresses, containing in its lunette a circle which is hollowed out to admit two half-length figures; and below it is a circular-headed doublet, opening seemingly on to a loggia; beyond these, to the right and left, are walls marked with an arch, with a hemispherical niche with a bust in the lunette, and above is a pedestal bearing an enormous finial. The top story consists of three divisions; the centre one over the pediment and doorway has an arcade of five arches, and the two sides have four, and the whole is crowned by an entablature, whose frieze has cantilevers supporting the cornice above. Over the cornice is a sort of unpierced balustrade supporting the eaves of the roof. The angles of the building are flanked with two narrow towers, the top story of which has an open arch in it, and the pilasters at the sides of this opening support an entablature of Egyptian character, above which is an enormous fantastic finial. The only really attractive portion of this structure is the invention shown in its parts, and the admirable way in which these parts have been carried out. I think I ought to tell you that I have never seen the Certosa at Pavia.

I may as well say that this re-fronting of the Certosa was begun in 1491, and the architects are believed to be Ambrogio Borgognone, Giovanni Antonio Amadeo, and Angostino Busti. Above the first line of small windows the architects are said to have been Dolcibono and Christoforo Solari.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE HOUSING OF THE DRAMA.

A MEETING of this Institute was held at No. 9, Conduit-street, on Monday, Mr. H. L. Florence, Vice-President, presiding. The Secretary, Mr. W. J. Locke, announced that the sum of £30 had been given by the Architectural Union Company towards the purchase of additional books for the Library, and the Chairman proposed a vote of thanks to the donors, which was heartily agreed to.

The Royal Gold Medallist.

Mr. C. B. Fowler, the newly-elected President of the Cardiff, South Wales, and Monmouthshire Architectural Society, having been introduced to the meeting,

The Chairman said there was one evening in the year to which they looked forward with feelings of great curiosity and some degree of excitement, because of the announcement of the name which the Council had to recommend as the candidate they proposed as the recipient of the Royal Gold Medal. The name they proposed to submit to the Queen was one than which there was none more familiar to the members of the Institute. They proposed to recommend as the recipient of the Royal Gold Medal this year the name of the President, Professor Aitchison, R.A., and they did so not only on the ground that he was so well known to the architects of England, the whole Continent, and the Colonies, but also because he was the representative of that literary art and that liberal culture and knowledge in which perchance the architects of the present day were not the equals of those of some years back. As a further proof of how judicious their choice had been, he might tell them that the President's name was selected and chosen before the announcement of the latest honour which had been conferred upon him. After his name had been unanimously accepted by the Council they learned that he had been chosen to be raised to the position of full Academician of the Royal Academy. They were acquainted with the works of their President in architecture and in decoration, and many of them had been students of his at the Royal Academy and would long, as he (the speaker) did, to see all his lectures collected and printed and brought forward as a volume or volumes that they might not be the mere

passing lectures of an hour, but might remain with them through the future as a guide, historical, literary, and learned, for the benefit of students, which they all were from the day they took up the study of architecture to the last day on which they practised it. Throughout their whole lives they would feel the benefit of having studied the lectures of Professor Aitchison.

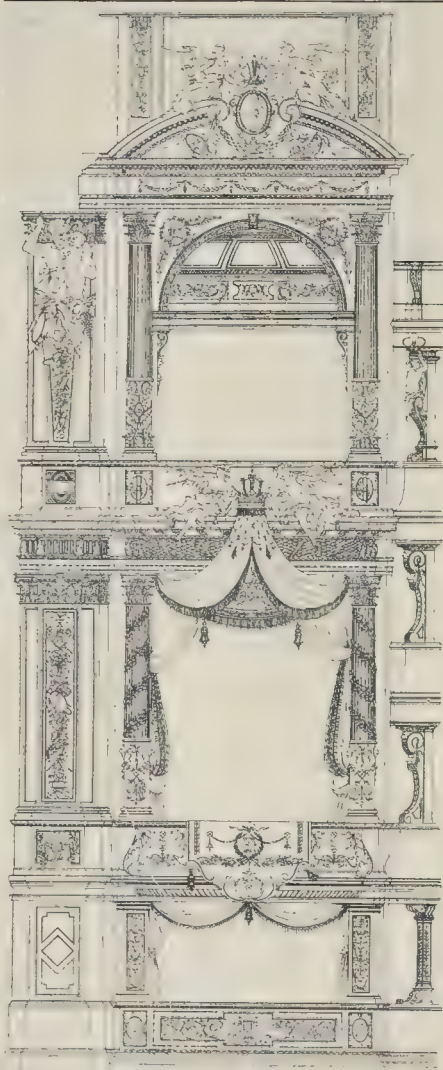
Mr. W. Woodward entered a protest against the action of the Council in nominating as the recipient of the Gold Medal the President actually in the chair at the time.

The Chairman said that it was not an unprecedented occasion and that the same thing had been done before; namely, that the President was proposed for the Gold Medal while he occupied the chair, and he duly received the Gold Medal, as, he trusted, would be done in this case.

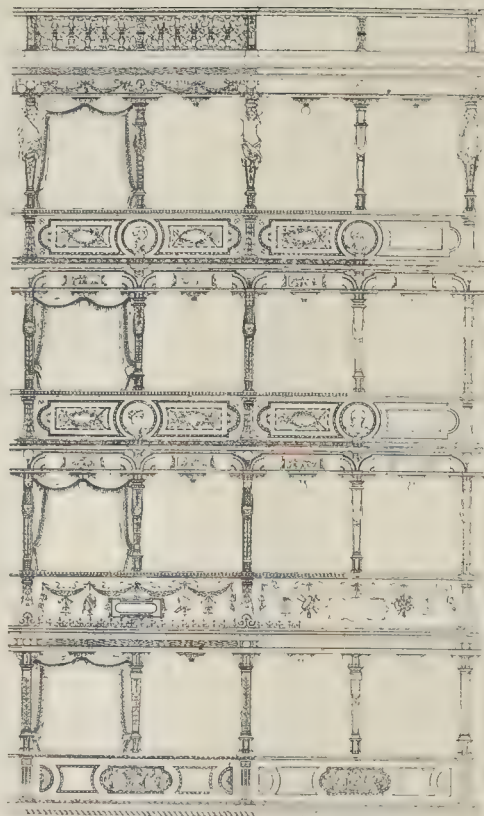
Mr. Woodward asked for the name.

The Chairman: Mr. Charles Barry. The second remark he had to make was, that it did seem to them that the year of the Jubilee, in which architecture was not specially recognised, was a most fitting occasion on which the head of their Architectural Society should be honoured. He felt convinced that the name which had been proposed was one which, on consideration, would be received with approbation, and the Institute could feel that under these circumstances the Council had done well.

Mr. Edwin O. Sachs then read a paper on "The Housing of the Drama," with special reference to subscription and endowed theatres. In his introductory remarks he explained that his contribution was framed on broad lines and did not deal with questions of construction or planning. His endeavour was to treat of some of the aspects under which a playhouse devoted to the production of drama could be constructed, not only as a temple of art, but also as the pride of the nation or community to which it belonged. These aspects, he considered, demanded the attention of the architectural and allied professions; for, without the assistance of the architect of to-day and his co-workers, the successful issue of any movement for a better class of building was almost impossible. He then explained that when speaking of the one form of entertainment under consideration—the drama—as distinct from the opera or lighter forms of amusement, it would be well to bear in mind that this included comedy and tragedy alike—the chamber play as well as grand drama—in fact, all such presentations of plays as were given with due regard to art and literature, as well as for purposes of education, with the object of dealing with serious problems or for the recreation of the cultured. A number of questions were then asked. How is the drama, in its highest sense, housed to-day? How is it housed in the metropolis, how in the provinces, how abroad? What principles guide the constitution of the home of the drama? What is the basis on which buildings devoted to the presentation of plays are erected? The answers to these questions the author held to be all-important when considering whether a playhouse fulfilled the function for which it was provided. They were also essential, he thought, if we wish to know the lines on which a modern playhouse should be built. He then showed how London had no other form of playhouse than what is termed the private theatre. However high a standard might be reached by productions associated with individual examples, these private theatres could not be considered otherwise than as having their basis in commercial enterprise. But on the Continent, what did we find? Among Latin countries in the South of Europe the private theatre was met with to a considerable extent. The private theatre was also to be found in large capitals of the Teutonic countries in Northern Europe. The private theatre which was subsidised by the State or otherwise was found in Paris and Northern Italy. The private theatre, however, was not the typical home of the drama for the Continent. Principally the municipal, the subscription, or endowed theatres prevailed, and also, to a certain extent, court and national theatres. Commencing with the municipal theatre, its object, he said, was generally educational and recreative, the low price of admission enabling all classes to witness the performance. Beyond the original outlay on the building, the ratepayers might either allow some annual vote towards maintenance, or they might simply guarantee to meet



Fronts of Royal Boxes.



Fronts of Public Boxes.

The Court Theatre, Vienna.

any deficit, should there be one. It was merely a question of a good stage management and the pricing of admission; for, as there were no profits to be made, the plays should practically be presented at cost price. Next, the subscription theatre was a gift presented to the town, sometimes by one or more of their wealthy citizens, at other times by a large section of the community, who voluntarily desired to participate in providing the city with a suitable playhouse, and who contributed from a few pence to some thousand pounds according to their respective circumstances. Finally, the endowed theatre was an institution for which land and building were presented, together with a sufficient sum put in trust to cover the maintenance of the block, and any reasonable deficit on the productions. It was the *bond fide* endowed theatre of which this country is distinguished. The most recent form of the subscription theatre was the "People's" Playhouse, voluntarily subscribed for by every class of the community, and conducted on co-operative lines, while a particular form of the

endowed institution was the playhouse which had been provided for on philanthropic lines for the entertainment and elevation of the working classes in the same way as many of our free libraries are established. Now each of these—the municipal theatre, the subscription theatre, and the endowed theatre—was essentially a public institution. The standard of its founders was a high one, and where this was the case it followed that the conception and rendering of both interior and exterior—in other words, the architectural lines—ought to attain an equally high standard. The municipal theatre practically always stood as a monument to the prosperity and culture of a locality, and the architecture of the subscription theatre was intended to give a similar impression. National, government, and court theatres were primarily luxuries, not so much intended to afford suitable homes for the drama as to serve as places of entertainment and ceremony for monarchs or State officials. Being the outcome of luxury, however, these buildings frequently became veritable places of luxury, for nowhere was the play more sumptuously housed than in these establishments. The lecturer then spoke of the circumstances which

governed the design of a theatre, and he explained how in the private theatre we had only a problem of economy to solve, and the only regard that had to be given to the architectural rendering was whether the individual holder or lessee considered that his audience required a little more gilt, a little more York stone, art in its best meaning, a semblance of art, or the gaudy treatment of an advertisement. A few managers, though risking their money, thought of the suitable housing of the drama, independently of the absolute restrictions of *l. s. d.* Sir Henry Irving was an exception when he first put the old Lyceum in order in 1878. As a rule the architectural merit of the playhouse was considered a matter of minor importance, as long as there was the customary supply of velvet and gilding in the auditorium. The London manager and his provincial colleague had only to cater for the pleasure of a sensation-seeker practically devoid of any feeling for architecture, and with little reverence for dramatic art. The British public cared very little for architecture. It was otherwise outside our isles. With a genuine reverence for dramatic art, there was also a genuine interest in architectural work,



Decorations, Municipal Theatre, Zurich.

h the result that the play mostly found a worthy home amid appropriate and dignified surroundings. The lecturer, in connexion with the question of design, touched on the theatre architect, and explained how the modern playhouse was generally placed in the hands of architects who were merely good planners, good constructors, and business men, with a qualification of being able to provide a maximum audience at a minimum outlay. With but few exceptions, it was of little importance if the so-called theatrical architect had the true feeling of art, if he could only secure the latest trick of the plaster manufacturer to catch popular taste. What counted more than any repute for architectural design was, that the architect should have the talents and facilities of a financial agent, and be able to find money for the enterprise. Now, indeed, the architect of a playhouse had to be an architect in the very highest sense of the term; and this was as it should be, for the building of a suitable home for the drama was one of the most difficult tasks that an architect could undertake, and called for a man endowed with the true spirit of the architectural vocation. The modern theatre demanded the largest share of real beauty, and the most careful blending of architecture, sculpture, and painting, whilst the complicated practical requirements were at the same time hostile to all his efforts at perfection in design. According to the lecturer, there was, in fact, no class of architectural work which puts forward more numerous, complex and essentially technical demands, and requires at the same time that the rendering should not fall below the highest standard of taste, than that of the theatre. Views and drawings of a large number of theatres were shown. The collection embraced playhouses from all parts of Europe, including Russia, Scandinavia, Roumania, and other countries not popularly associated with the drama. The great superiority of design in the Court, national, municipal, and subscription theatres was indicated, particular emphasis

being laid on the fact that of our own playhouses the Shakespeare Memorial is one of the few exceptions where considerable architectural merit was observable, and this was practically an instance of a subscription theatre. In conclusion, the lecturer recapitulated the various examples and the different kinds of institutions, arguing how apparent it was that we could not expect from the private theatre what the other classes of structure gave us. The lecturer then showed how our national institutions were such as to make it highly improbable that we should, within reasonable time, have either a Court theatre or a State theatre; and, with the few exceptions in our most go-ahead cities in the north, he considered it unlikely that we should even soon see the municipal theatre. He then asked if it was not time to consider the question of subscription and endowed theatres seriously. Why, if we subscribed to the erection of picture galleries and the homes of other arts, could we not subscribe to the theatre? If we endowed museums and libraries, which were to aid in our education and afford us beneficial recreation, why could we not similarly endow the theatre? If we wished to erect monuments to mark the culture and prosperity of our times, why should they not take the form of playhouses? And if it was the universal desire that facilities for education should be given, why limit our gift to the collection and distribution of books, or the collection and presentation of art treasures, when words on the stage, properly spoken in suitable surroundings, produced a greater impression on the mind than any amount of book reading or the study of museums? Calling attention to the many institutions by which England had become great, he advocated that the citizen should take the initiative himself, and either by subscription or through endowment by the wealthier members of the community, give us that high standard of playhouse which we should rightly long have had. He concluded by saying: "Surely the architect who writes as he sees the many theatres from which every vestige of the feeling of art is

absent, should help to his very utmost in any movement towards providing us with better homes for the drama—structures which should at the same time become some of the most decorative features of our cities. Failing government or municipal action, surely the subscription or the endowed theatre will lead soonest to this end. And, hence, may I conclude by urging that the architect, with his great influence among all manner of men, should advocate the subscription and endowed theatre as the only practical road at the present time towards the drama being suitably housed with due dignity and full regard to the possibilities of architectural design."

Mr. Bernard Shaw, in the course of the discussion which followed, said that his education in architecture had been very much neglected, for he was in the habit of going to places where there was not much architecture. While a large number of people regarded the theatre as such a wicked place, he was afraid the time when Mr. Sachs' suggestion could be carried out was very distant. He fully agreed with the idea of having a building which was architecturally good, for he was of the opinion the theatre gave moral ideas and culture to more people than the Church did.

Mr. William Archer said that it was easier to endow and subscribe to a picture gallery, a museum, or a library. These required very little management. But in the case of a theatre it was different. It would be very difficult to find the proper manager and the right actors for such a place. He did not like the idea of running a subscription theatre on Shakespeare, as was proposed. He did not think that such a theatre would be worthy of support. He quite agreed, however, that more beautiful places were required for the drama.

Mr. Alfred Darbyshire, Manchester, said he agreed with Mr. Sachs in all he had said with regard to the housing of the drama. But, unfortunately, he had come to two or three conclusions, and he had had some unpleasant truths forced upon him while listening to the paper. In the first place, he might have been conscious before, but he was doubly conscious now, that, in the matter of theatrical architecture, we English people were far behind those of the Continent. It was a sad reflection, but it was an undoubted fact, we could not produce in England a single architectural triumph in theatrical architecture, so far as he knew. He had also arrived at another conclusion, namely, that, under existing conditions—that was, under private enterprise or private speculation—we should never do so; we should never reach to the height of those lovely things to be seen abroad. That was a very sad thing, but it was the truth. It occurred to him the other day, while strolling through Trafalgar-square, and thinking of what true theatre architecture should be, how much could be done with the Waterloo site; or, better still, perhaps, in Park-lane at Dorchester House; but as an architect he had to turn away from both sites with a sigh, because he knew that private enterprise and private speculation never could raise money enough to achieve a result on those two sites. Therefore, he was quite in accord with what Mr. Sachs had advanced against private speculation. It was hardly necessary for him to say in that room that when an architect had to design a theatrical facade which was hemmed in by other buildings—in other words, when he had no perspective returns, when he had no open space, and he was simply cribbed, cabined, and confined, he could do nothing. Therefore, as long as our present conditions obtained, the theatrical architect would never have the chance of producing anything worthy of what was to be seen abroad. What were they to do to obviate that, or to get rid of this sad condition? Mr. Sachs had advanced two or three excellent theories. He had talked about what had been done abroad by the monarch or the court, and he had also said what governments had done and what municipalities had done. It was a very simple thing to form a conclusion as to what could be done in England on any of these lines. As to the monarch or the court that was quite out of the question. If an old king were to arise, he would be an anomaly in the coming century; he would have no chance at all and would be completely out of place. The Government could not do it, because if it erected a National Theatre, say, in the Metropolis, which would be the natural thing to do, the rest of the country would rebel at having to pay towards that Institution. It would, therefore, have to extend

its theatre work to the principal cities of the Empire, and the result would be something enormous in the expenditure of public money. Therefore the Government could not do it. We were thus driven to the different municipalities of the country. The great cities of the Empire were the centres to which they had to look to realise what Mr. Sachs had set forth in his paper. He took a pride in his native smoke-begrimed city of Manchester, and in the common sense and shrewdness of the Lancashire character; but if such a thing were broached as something like a penny in the £ of a tax to produce a municipal theatre in Manchester, he was afraid to think what the result would be. They could not even raise money enough to house their works of art, and a great discussion was now going on for the purpose of trying to raise money by which they could erect an art gallery worthy of their treasures. He had a circular in his hand which had been addressed by a number of enthusiasts to important citizens of Manchester. The Lord Mayor had been approached and he had been asked to take the matter up; he had kindly done so, and more than that he had arranged to take the chair at the forthcoming meeting. The circular was as follows:—It has been proposed that a committee should be formed in Manchester for the encouragement of the representation of Shakespeare's plays and the support of dramatic art worthy of a great city. You are, therefore, invited to attend a meeting in the Lord Mayor's Parlour in the Town Hall. Mr. F. R. Benson has accepted an invitation to deliver an address on the Relation of the Drama to Civic Life." They intended gradually, if that Committee were formed, to spring the great mine of municipal endowed theatres. In reference to his old friend and their late colleague, Mr. Phipps, he was under the unfortunate conditions which obtained with regard to theatre architecture in England at the present moment; that was, being entirely under private speculation and private enterprise; but he had produced in Her Majesty's Theatre the best building that could be built under the conditions, and he (the speaker) had very great pleasure in saying, and he believed they would all agree with him, that in that theatre, under those circumstances, he had left a monumental work.

Mr. Cecil Raleigh asked what it mattered what a theatre was like outside. It really did not matter what the outside of a theatre was like, and the perfect theatre was a building in which a play could be produced to the best advantage. If the outside consisted of four square brick walls, it did not matter in the least.

A vote of thanks to Mr. Sachs for his paper was moved by Mr. Gruning, seconded by Mr. T. Blashill, and carried by acclamation.

The Chairman announced that the next meeting would be held on the 21st inst., when Mr. J. Tavenor Perry would read a paper on "The Medieval Campanile at Rome." The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION: HAMPTON COURT.

AN ordinary meeting of this Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Mr. Hampden W. Pratt, President, in the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected as members:—Messrs. E. S. Curram, A. H. Longhurst, P. D. Murché, H. E. Sabey, and D. Stewart.

The Chairman announced the commencement of the following lectures:—On the 16th inst., Mr. W. G. B. Lewis' lectures on "Perspective"; on the 18th, Mr. A. O. Collard's lectures on "Specifications and Estimates," Division II.; on the 22nd, Mr. Max Clarke's lectures on "Hygiene (Drainage and Water Supply)," Division II.

Mr. John Belcher then read the following paper entitled "Hampton Court Palace."

The public buildings of this country receive scanty recognition as works of architectural merit. As a nation, we have little respect for anything outside our commercial interests, and it is not surprising that there is indifference to, or ignorance of, architecture, seeing that it is

regarded by the many as a mere decorative or advertising medium. Where any historical interest envelops a public building it is visited and admired, though its architecture *per se* may fail to delight or stir emotion.

In addressing you this evening on a building like Hampton Court, I shall consider it from the architectural standpoint, and not be biased by any sentimental regard for its ancient charms. The glamour of mediævalism is apt to tempt some to invest any ancient building with a superior architectural value. Without undue reverence for the past, we may safely allow our admiration and affections to go out to every part of Hampton Court, and we can make use of its archeological facts, to trace the architectural developments made necessary to meet advanced requirements.

Most palaces come under the category of "Public Buildings," but Hampton Court has the further distinction of being a combination of domestic and public building. It is not only a building for State purposes and ceremonies, containing a series of reception rooms, with a few Royal living rooms also, of more or less public character, but it is a palace which exemplifies both the stately magnificence which appertains to Royalty, and the domestic life peculiar to and fostered by this country.

Its beginnings may have imparted to it the homely character it still retains. Before it became a Royal palace, there was a country mansion on the site, and to this Wolsey probably added his palace. We find it spoken of as a small "Manor House on the bank of the Thames, extending in about 2,000 acres of land." It belonged after the conquest to the De St. Valery family, who in 1217 handed it over to the Knights of St. John of Jerusalem. About three hundred years later this estate, with the Manor House which has always been known as "Hampton Court," was leased for 99 years to Cardinal Wolsey, at a rent of 50*l.* a year.

From this time, its history as a palace commences, and building operations on an extensive and commendable scale were proceeded with. Our sympathies at once go out to the fortunate architect. But it is not very clear whether there was any architect, for such works were most frequently carried out by a combination of artists who worked together on traditional lines in perfect harmony—the architect, the master mason, the master carpenter, and all the several artificers keeping within the limitations of their respective crafts and thoroughly understanding the needs of each. Probably the men were accustomed to work together without drawings, much as the Hungarian gipsy bands discourse their wild music without knowing anything of musical notation. No doubt there was a leader or supervisor, whether called Surveyor of Works or Clerk of Works or (later) Architect. He was "first amongst equals."

Seventeen years later when the work was carried on by Henry VIII., there are two names mentioned in the Hampton Court bills—Henry Williams, a priest, "Surveyor of Works" at Hampton Court, who would appear to have supervised all the details, and Eustace Mascall, who was "Clerk of Accounts." The latter is sometimes spoken of as the "Clerk of the Works," and was also clerk of the works under the Cardinal for his College at Oxford, where the details are similar to those at Hampton Court. It is interesting to note that these titles are still kept up at Hampton Court—there is still the "Clerk of the Works," the "Master Mason," the "Master Carpenter," and so on. These and the traditional methods have been passed down from the sixteenth century without any break.

Mr. Law, the able historian of Hampton Court, to whom I am indebted for so many details which his patient research has brought to light, remarks that, after an examination of the carefully preserved accounts for the several works during the reign of Henry VIII., he finds that the workmen were all Englishmen. He says "Even the most delicate carvings and paintings of the roof of the Hall, which are sometimes stated to have been the work of Italians and other foreigners, are proved to have been entirely executed by men so palpably Anglo-Saxon as Michael Joiner, Richard Ridge, of London, John Wright, of South Mimms, John White, of Winchester, John Hobbs, Henry Blankston, John Hathe, Reginald Ward, of Dudley, John Spencer, of Hampton, John Reynolds, of East Moulsey, &c." This, of course, is highly satisfactory. Still, we know that both Wolsey and Henry VIII.

had part in bringing about that development of architecture, which we know as the Renaissance, for they both imported Italian workmen, and they both employed them at Hampton Court on decorative work. These foreigners were not builders, but only carvers and decorators, and we can trace their influence in the work of the Englishmen. The well-known terra-cotta roundels on the gateway turrets were made by an Italian, Giovanni Majano (2*l.* 6*s.* 8*d.* each). They were similar to the terra-cotta busts used by Holbein in the Gateway at Whitehall, and like them were fixed in the turrets. This use of terra-cotta is fair and legitimate. It is obviously not a constructive material, and the early instincts of the honest builder kept it in its proper place.

Another example is in the plaque containing Wolsey's arms—also in terra-cotta. These and the roundels have well-developed Renaissance details, which were evidently regarded as in any way incongruous by Wolsey or Henry VIII. The ceiling and frieze of "Wolsey's closet" is, like other plaster work of the period, no doubt the work of Italian. On the other hand, the great pendants of the hammer-beam roof of the Great Hall, which are Italian in character and feeling, were the work of a Londoner, Richard Ridgway, who had come under the refining influence of the Renaissance.

We will now pass through the building erected by these workmen under Wolsey and Henry VIII. It is not improbable that the old Manor House, which he found on the site, was incorporated by Wolsey in his new building. This would seem the more likely, as, about a year after the commencement of the work, he received the King and Queen there. And some old prints there is represented what might be the old manor in the centre of the east front. No trace of this is left, but that the matter is one of more interest to the archaeologist than the architect.

Wolsey was a man of large ideas and sumptuous taste, and the magnificence of his palace filled his countrymen and foreigners with envy. The King himself evidently coveted it, and rather prematurely took possession of it. It was evidently a palace quite up to date in its arrangements and appointments. It was natural that the plan should partake of the collegiate quadrangular form. Yet on the west front there is a new departure to be noted, for at the western entrance two projected wings form a three-sided court, each wing, however, containing smaller internal courts. It is difficult to determine exactly how much was included in Wolsey's palace, or how it was developed by Henry VIII., but I think Wolsey may have credit for the largest share in the scheme. The regularity of the plan, and especially of the entrance and first court, proves this. It is true that the south and east fronts are represented on old plans and prints as very irregular, but existing buildings of other needs may account for this.

Hampton Court soon became a Royal palace, and from Henry VIII. to George IV. alterations and additions were in frequent progress. Those made by Henry VIII. considerably added to its attractiveness and importance. His work consisted largely in decorating and beautifying the existing structure and in remodelling certain parts to make these suitable to the Royal requirements. He affixed the Royal Arms and added badges and heraldic devices, such as the rose, the portcullis, the *fleur de lys*, and crowns on the buildings. Parapets and pinnacles were added, and the whole building "restored" quite in the modern manner. It is this treatment which increases the enjoyment of the archaeologists, who are apt to look coldly upon the subsequent additions by Sir C. Wren about which no mistake can be made, and where there is nothing to argue about on the score of date.

Who was responsible for the several buildings it is fortunately not necessary for me to determine, though the facts are interesting, inasmuch as the result which concerns us here. It is impossible for me to do more than point out those parts and effects of the buildings which have struck me as worthy of attention, and I may perhaps be forgiven if I dwell rather longer and more lovingly upon the later Renaissance work than upon any other part. Indeed, if it had not been for this, I should probably not have accepted the invitation of your committee to read a paper on Hampton Court. But before addressing myself to the congenial part of my subject I must direct you

—These very frank remarks may be taken as expressive of the views of the average Englishman in regard to architecture. Ed.

ention to all that is good and excellent in the
er work of the Tudor period.

Perhaps the first thing that strikes us is the
utiful colour effects, partly due to age and
osphere, but partly also to deliberate
sign. No doubt it was convenient—but it is
proved to be a right principle—to use local
materials as far as practicable. The bricks, we
told, came from Brouxham, Taplow, and
er adjacent localities. Some of the stone
me from quarries in Reigate, Basingstoke,
d similar places, but Caen stone was also
nd where these were unsuitable. The oak
is brought in large quantities from Dorking,
olwood, Leatherhead, Banstead, Berewood,
d St. John's Wood. With regard to the
ermal effects, the beautiful texture was
ained by the inequality of the bricks, and the
e of vitrified bricks in squares and lozenges.
is which imparts to the whole that
urple tone which is so admired. I do not
elieve that this was done from a dislike to
air surface—that is a modern complaint—
because there is no great regularity in the
osition of the hatching, but it is touched in,
such as an architectural draughtsman might
ort to a little cross hatching to suggest
lour to the surface. This treatment of the
urface has been carried a little further in
the first court, where there is a frieze or
and of lozenges regularly placed and re-
eated. I draw your attention to it as it
ccurs again in the Hall and Clock Court.
his does not prove that the Hall was not the
riginal one built by Wolsey, though it was not
en the habit to reproduce and copy the original
ork on making additions. I am inclined to
elieve that Henry VIII. did not rebuild
Wolsey's Hall, as has been thought, but that
e merely put on a new roof or otherwise
ished it. The Hall is by no means larger than
any noblemen's halls which were in existence
hen Wolsey commenced his. Penshurst had
een built in 1520 and New Hall in 1524, and
Wolsey was not a man to submit to be outdone
y others. Originally there had been an open
ntern in the roof to let out the smoke from
he wood or the fire-dogs in the centre of the
oor, as seen in the older hall at Penshurst;
ut there is no sign of there ever having
een one in the present roof. The use of
himneys, especially of shafts or terminals,
was recent, and attention was drawn to this
ristocratic novelty by the elaborate and
aried treatment of the shafts. It is this frank
reatment of a new feature or requirement
which we do well to note. Instead of hiding
t, or endeavouring to represent something else
of an earlier date advantage is taken of it in
the design. Its purpose is recognised, while
is used as a decorative feature. Most, if not all,
of these cut brick chimney terminals have had
e rebuilt, and pipes have been introduced
o make them more operative. It should be
remembered that they were more or less an
periment. As a picturesque feature they are
so successful that they have been imitated,
though not rivalled, during the Gothic revival,
whereas the men of the "Later Renaissance,"
such as Wren, still following true principles,
discarded the separated shafts for the practical
reason that by grouping or combining several
flues in a square mass they gained in effective-
ness. It is obvious that if the flue exposed to
the external air is of thin brickwork (and that
cut) it will be cold and the smoke will not pass
easily; whereas if the flues are grouped
together and have good outside enclosing walls,
like the large chimney stacks of the later
work by Wren, they will be serviceable.
Again, those chimney breasts and stacks,
especially on the west front, illustrate how the
pirit of the Renaissance was already at work in
the feeling after uniformity and balance of
parts. Indeed this west front becomes a
"facade" by its dignified regularity, and is a
new departure in domestic building. Its form
is the prototype of many mansions of a later
date.

We must not linger outside, but return to
the "Clock Court." Here are the entrances
to the Royal apartments. Opposite to the
Clock Tower is the entrance to the Queen's
Great Staircase. This has been disfigured
by some Gothic revivalist in the reign of
George II. who has somewhat needlessly
affixed the date 1732 to his work. It is injurious
to look at, and fortunately there is something else
which instantly commands our attention. On
the south side is the entrance to the King's
Great Staircase, and now the wider we open
our eyes the better. Here is something essen-
tially masculine. Here we have our first taste

of the Later Renaissance work. The magni-
ficence of that colonnade in scale and propor-
tion impresses us at once. Even Mr. Law,
whose archaeological sympathies are centered
upon the Tudor work, and who cannot forgive
Wren for removing or hiding any of it, admits
that this colonnade is most creditable. It is in
itself, he says, very handsome, "though out of
place amidst Tudor surroundings." For my
part I cannot imagine anything finer for the
purpose. It tells its tale quite plainly; and
without pretending to belong to the original
building, it takes its proper place in its history,
and brings it up to the date. I find myself
speechless before it. What is it which gives it
such impressive charm? We know it is
80 ft. 4 in. in length. That it is 20 ft. 6 in. in the
clear inside, and the height to the top of the
parapet is 27 ft. 9 in.; but these dimensions are
nothing extraordinary. It is the exquisite pro-
portion, the subtle setting out of the spaces
which entrances the beholder. That trick of
coupling the columns, which Wren learnt of
Bernini in Paris, and which he employed at
Chelsea and Greenwich Hospitals, is effec-
tively made use of here. But instead of what
is known as "Wren's favourite Doric," just
look at those Ionic caps! You must go and
sketch them carefully to appreciate them. The
carving of these and of the vases with orna-
mental trophies under them which mark the
centre, is all excellent.

The colonnade faces the north; yet you never
seem to want the sun to brighten it up, so
admirably is it lighted and so well do the
internal reflections dispel all gloom. The
irregular setting out of the ceiling is the only
thing I have never quite liked. I feel the same
at Greenwich, where the ceiling under the
regular colonnade is broken up. The con-
tinuous coffered would, I should imagine, have
improved the perspective. But Wren did
nothing without a purpose, or without con-
sideration, and I should much like to know his
mind upon it. I should like also to keep you
longer at this colonnade, but I have other
interesting works to inspect with you. This
entrance, while it does not in any way clash
with the surrounding buildings in this court,
is the legitimate outcome of the Renais-
sance initiated by Wolsey and Henry VIII.
Standing in this court you can take in the con-
dition and progress of architecture from
Wolsey's time in 1514 to George II.'s in 1732.
It was not the influence of William III. which
brought about this result, for we know that
before his accession in 1689, some of the finest
works of the Renaissance had already been
carried out. In 1619 Inigo Jones had made his
wonderful design for a Palace at Whitehall,
and the small sample of his intended work was
built. In 1678 the library of Trinity College
was built by Wren. St. Paul's was com-
menced 1675, Chelsea Hospital in 1682,
Winchester Palace (intended to rival Versailles)
in 1683, and Kensington Palace in 1680, so
that many notable buildings were built or
in hand, and architecture was developing
rapidly. If at Hampton Court the transition
may seem sudden, we have to remember that
no structural additions of any importance were
made from Henry VIII.'s time until William and
Mary's reign, i.e., 1530 to 1690. Only in
the internal fittings and decorations is there
any indication of the early Renaissance. Little
was done in Elizabeth's reign, except in the
garden; only a few rain-water beads have her
initials on them, and these, like those of Henry
VIII., are decidedly Renaissance in character.

In James I.'s reign, Inigo Jones was appointed
Surveyor in 1615, but I cannot discover any
work of his in existence. His time was probably
taken up in arranging the masques in the
Great Hall for the Queen, and his imagination
was exercised in wonderful architectural vistas
and scenic effects. Mr. Law tells us in his
interesting book that the players were a
company entitled the "King's Company of
Comedians," who had been incorporated
by a warrant of King James a few
months before, and that the second name on
the roll is that of William Shakespeare, who
was no doubt present in the palace. Even in
Elizabeth's time the scenery was of a most
realistic character, so that in spite of the general
idea to the contrary, stage scenery is by no
means modern, though it may be more perfectly
adapted now. It was fortunate for William
and Mary that with the occasion for
additions, there was the man at hand. The
King was delighted with the place and its
capacities, and determined to bring it up to
date, as he considered it wanting, as no

doubt it was, in many of the conveniences
of a modern palace. Mr. Law suggests that
William was captivated by the long straight
canal fringed with avenues of lime trees—such
as met his eye at Haarlem and the Hague. I
admire the King's taste; and the canal is a most
effective feature. But I must not digress. Wren
was set to work, and fortunately for him there
was no Society for the Preservation of Ancient
Buildings in his time, and not being a senti-
mental person, and having no great sympathy
for Tudor work, or for that part of it which was
irregular and broken up, he did away with the
irregular and inconvenient south and east fronts.

If we examine Wren's plan we can readily
see that it was determined by the aforesaid long
canal on the east side. A centre line drawn
from this to a point cutting the lines of the
converging avenues would, to the mathema-
tically-minded Wren, give the centre and
building line of the new front, and this front
would be at right angles with the centre line.
From the centre to the south corner the length
covers the old buildings, and, of course, the
length from the centre to the north corner is
just equal to it. The total length of this front
is 300 ft. Again, the south front is at right angle
with the east, and is 315 ft. long, a length
which was fixed also by the buildings existing
in the rear. Behind these fronts was an old
court, called "Cloyster Green Court." The
position of this court could not be altered by
Wren in his reconstruction, and he therefore
built on the old lines the new court known as
Fountain Court, without reference to the
centres of the new south and east fronts. The
court is 116 ft. 10 in. on the north and south
sides. The east side is 110 ft. 1 in., but the
west is 1 ft. 1 in. shorter. This arises, as we
may gather from the plans, in effecting a junc-
tion with the old and irregular walls.

These works, commenced in 1689, were left
unfinished at the death of Queen Mary in 1694,
and little further was done until 1698, when the
destruction of the palace at Whitehall by fire
determined the King to complete his palace at
Hampton Court. There is an estimate by Sir
C. Wren, given in Mr. Law's book, which tells
us what work was proposed and from which
we can infer the condition of the works in
hand. I think I will quote this, as it is a good
model of the sort of communication to a client
on such matters:—

"ESTIMATE OF FINISHING PART OF HAMPTON COURT.
To the King's Most Excellent Majesty."

May it please yr^{ty} M^{ty}.
Your M^{ty} having been graciously pleased to signify yr^{ty}
commands to me, that I should give an estimate of the
expense of fitting the inside of the Rooms of State at
Hampton Court, from the entrance out of the Portico, to
the rooms already finished above saide, containing the
Great Staires, the Guard Chamber, the Presence Chamber,
the Chamber Drawing room, Ante Room, Great bed-
chamber, Lobby & Gallery for the pictures; in pur-
suance of this command I humbly represent that although a
perfect estimate of Finishing the inside of any house is as
yr^{ty} M^{ty} officers of works what is requisite to be done,
according to the Intention of the owner; yet upon suppo-
sition that your M^{ty} would finish as decently as the great-
ness of the Rooms seems to require, and having consulted
with yr^{ty} M^{ty} officers of works what is requisite to be done,
the charge of each Room, I have represented the work
of each Room, and the total expense as followeth.

1. The Great Stair to be made with steps of the
Irish stone, such as are at Kensington, but longer and
easier, with Iron Rayles of good worke, the Floor and
Hard-places to be well paved with marble; the walls to
be wainscoted twenty feet high, with fine Dore-cases.
2. The Guard Chamber to (be) fitted for Armes as at
Windsor and other houses.

3. The Presence Chamber to be fitted for Hangings with
marble in the Chimney and the Stools of the Windows and
proper Ornaments.

4. The Privy Chamber in like manner.

5. The Drawing-room with some variety, as having
the best furniture.

6. The Anti-room well finished.

7. The Great bed chamber to be perfected.

8. The Gallery to be fitted for the Cartoons, with
wainscote on the windows side, and below the Pictures and
between them, to preserve them from the walls, and with
a marble chimney & marble Soyles in the windows, and
other things proper to complete the same.

9. The Lobby between the presence and Gallery to be
ceiled and finished.

10. The boards of these Rooms (being already provided
very good and drie) are to be layed after the best manner,
without nayles and with battens under the joynes.

The expense of this worke thus performed by good
artists will amount to the sum of . . . 6800^l.

All the insides of these Rooms have been long since
designed, and shall be presented to yr^{ty} M^{ty} for your appro-
bation and correction, and accordingly the expense may
prove more or lesse; but I am humbly of opinion the
worke may be decently performed to your M^{ty} satisfaction
for the same above mentioned.

It may further be considered that other things will be
required for the accommodation of those who are to be
near your Royall person, and that the Courtes must be
paved, more sewers made, and the water brought to more
places, and other things necessary for your M^{ty} service
which may be estimated as they are directed.

All which is most humbly submitted.

April 28, 1699. CHR: WREN

Thus we gather that the east and south sides

were externally completed, and the upper rooms, but that the State rooms and staircases were not.

But the King contemplated further extensions, and there is a plan belonging to H.M.'s Office of Works shewing what I have little doubt had been a part of Wren's scheme from the first, the formation of a new and grand approach on the north side. Such new entrance was to be made commensurate with the grandeur of the new buildings then in hand. The plan, which has been kindly lent us this evening by H.M. Office of Works, shews the Great Hall as the central feature, with a double flight of steps to the hall level. The Hall, being a prominent feature, would then have taken its proper place in an orderly arrangement of buildings. The entrance court as planned was to be 300 ft. long by 230 ft. broad. It looks long, but we must remember that the moat made by Wolsey (probably the last ever found), was still in existence on the north side, and this court was brought out to it. Knowing what Wren could do with a colonnade, as in the Clock Court, and at Greenwich, we can readily imagine the magnificence of an approach such as he contemplated here. The stateliness of this entrance to the palace was to be still further enhanced by a 60 ft. drive through the park, a mile in length. And in contrast to the straight piece of water on the east side, a circular basin of water, 400 ft. in diameter (5 ft. deep), was to be formed at the palace end of the avenue, which at this point widened out so as to embrace a view of the whole palace. The great chestnut avenue in Bushey Park and the Diana Basin, as it is called, are the only parts of this great scheme which were carried out.

Like many another fine scheme of Wren's—like the palace of Inigo Jones for Whitehall—it was set aside. If disappointment came to such giants as these, we need not feel discouraged when our pet schemes and fine designs, by which we expected to set the world talking, are disregarded; indeed, the world has lost many good things for which it would have been the better!

In carrying out the work at Hampton Court Wren was hampered for want of funds (and here again we can sympathise with him!). As the work proceeded the funds ran short, and the Portland stone he loved was not forthcoming, so that he was compelled to use Bath stone dressings in many places—for instance, in the Fountain Court windows and on the south front. The upper range of windows on the east side of the court have all been renewed in Portland stone during the last few years. Sir John Taylor, in whose excellent hands the care of the structure is now placed, is also at work on the south front. To such a strait was Wren reduced that until a few years ago the central part of the south front was in cement. Now it is in Portland, as originally intended. Apart from its durability, Wren no doubt appreciated Portland stone on account of its weathering to a delightful silver grey, contrasting admirably with the red brick. That he regarded colour effects is evidenced by the bricks and slates he made use of. You will notice the difference in tint obtained by the dark red bricks in the base or lower story of the building and the bright colour of the "rubbers" above. On the south front there is a slight difference in the colour of the lower bricks. Whether this arises from the "weathering" on this side or is the result of another kind of brick used I am not certain. The lower brickwork runs nine courses to 2 ft., and the gauged and rubbed work above measures nine courses to 1 ft. 11 in., so the difference is slight. I do not know who invented "gauged" brickwork, but if Wren did not do so, it certainly cannot have been introduced much earlier.

The work at Hampton Court may be said to be after the Dutch manner, partly in compliment to Dutch William and partly it may be by his influence. It is lighter and less severe in treatment than many of Wren's other works, though without any loss of dignity or of monumental effect. Through it all, however, he has retained the English tradition. Whatever he assimilated he beautified. If there was any alloy, the gold predominated and the English stamp was upon the whole.

Mr. Maule, to whom I am much indebted for information, and who has kindly lent me the beautiful drawings and studies he has made of Hampton Court (they are doubtless known to you, but I commend them again to your notice for excellence of draughtsmanship and

accuracy), has pointed out a curious, and to me unaccountable, difference on the east front. On the south-east angle there are twelve stone quoins, and only eleven on the north-east corner! You will see this on Wren's original elevation, so it would appear to be intentional. There are other variations; one notable one I must mention. The width of the windows does not always correspond on the outside and on the inside, as you will find in the rooms at the south-east corner. They are divided into four divisions by sash-bars, but inside there are only three divisions. Here Wren sought to reconcile the need for uniformity in the exterior with that for proportion in the interior. He could have sacrificed the latter, as the spacing of the windows shows, but then if you stand and look at the proportion of window to wall space, the relative scale of one to the other, which is too much neglected nowadays, you will readily admit at what a sacrifice this must have been. Such an expedient would not be permitted now, and I have not the heart to find any fault with Wren, especially as it teaches us a most valuable lesson. Again, with regard to the circular windows, a beautiful feature (which we are always trying to reproduce), they were designed for the upper part of the large galleries and rooms, and how finely they come in the guard room (the first to be completed) we at once admit; but in other places these windows form the light to the entresol rooms, and some are blanks. Though the purpose is not manifest on the exterior it is legitimate, and the way the architrave to the circular windows is managed in these rooms is excellent.

Mr. Law severely criticises the pediment on the east front as being more or less a sham; but his opinion as to what Wren *should* have done I do not think will commend itself to an architect. He considers the pediment should rise above the balustrade and stand out with only the sky as a background! No; Wren was quite right, and I might cite numerous good examples of this decorative treatment of the pediment; but I must pass on and talk of the carving on these two fronts. That in the pediment is by Caius Gabriel Cibber, and represents "The Triumph of Hercules over Envy."

Mr. Law is my authority for also attributing to him the coats of arms supported by cupids. The master carver was Grinling Gibbons, but he was not a figure sculptor, so that this may account for the work by Cibber. Grinling Gibbons is responsible for the rest of the carving, though William Emmett did some of it. Gibbons was excellent as a wood carver, but these heads and keystones on the arches of the ground floor windows in stone are so undercut, especially those with the initials of William and Mary in monogram, that most of the latter, at least, have had to be recarved—and, what is somewhat unusual, they have been quite as well done as the original. Beautiful as they are, however, the material has not been recognised, but has been treated as wood. The beautifully carved lintels and eills projecting over the entrances of the east front are in marble, and carved on the underside.

There were originally metal figures above the columns on the south front, but these were removed to Windsor by George IV. Lately two figures have been sent from Windsor by the Queen to occupy what is said to have been their old position against the central piers on the south front. The stone pedestals are there, and the figures appear to fit them. They represent Hercules and Mars. These figures are found reproduced on a small scale as supporting the firedogs in one of the fireplaces of the State apartments. Mr. Law has brought to light the important fact, viz. that the ironwork at Hampton Court was designed by Jean Tijou, a Frenchman. It was carried out in England, and Huntingdon Shaw, who has hitherto enjoyed the sole credit, most probably worked on it.

I must now rush you through some of the rooms of the Palace, entering by the King's staircase. The walls and ceiling of the staircase were decorated by Verrio, in the manner he had made fashionable. How far Wren was responsible we cannot say. Verrio was the master-painter, and did what he pleased. Passing through the King's Guard Chamber, we can only stop to notice the carved architraves and beautiful panelling in Norway oak, with garlands in lime-wood by Gibbons, and the large panels of excellent detail and proportions, which are characteristics of Wren's work. A few specimens of these are on the screen. The chimney-

pieces have bold and varying architraves, the fireplaces. The King's rooms, which occupy the south block, lead one into the other. At the back of these, and looking into the Fountain Court is the King's Gallery or Great Council Chamber. This gallery, which has therefore, a north light, was specially arranged for the cartoons of Raphael. It is 117 ft. 24 ft., and 28 ft. high. For some reason, the circles which we see in the Court, and which correspond to the circular windows in the south and east fronts, are blanks. The light, therefore, is not so good as it might have been if they were windows. At present this gallery is spoilt, and its fair proportions hidden by a number of projecting screens, on which are exhibited small pictures. The Queen's apartments are on the eastern side, which is the principal front. Queen Mary's writing closet being at the corner, and adjoining the King's writing closet. Next to it is the Queen's Gallery. This is a fine room hung with tapestry, which looks remarkably clean and new.

With regard to this tapestry I should like to record the fact that this was discovered thirty-five years ago by the present courteous superintendent at Hampton Court, Mr. W. I. Pleasants. A picture having been removed a defect in the woodwork behind made apparent that some material was at the back like tapestry. Mr. Pleasants reported his suspicion to Lord Mount Temple, who at once sent word that he would make an inspection of the Palace, and that some of the woodwork was to be removed. Being an admirer of tapestry he was delighted to find that Mr. Pleasants' suspicions were confirmed. The woodwork was removed, and although dust and cobwebs abounded, and the huge and notable Hampton Court spiders marched on the tapestry was in good order and, after a good brushing, it looks now as fresh as ever. I am under the impression that it must have been covered up by Queen Caroline in 1733, for in Hervey's memoirs it is stated that she (the Queen) was very fond of pictures and brought a number from Kensington Palace. However that may be, we are indebted to Mr. Pleasants for a sight of the tapestry which was put up by George I.

The private rooms are interesting. The private chapel being without external windows is lighted by a pretty dome. The Queen's bathing room is well known to most. The public dining-rooms, the Queen's private rooms in the rear, and the Presence Chamber and Guard Chamber were only finished in the reign of George II. The details of the large rooms are rather coarse and lacking the refinement which is to be found in Wren's work. I was under the impression that Hawksmoor had something to do with this work, but Mr. Law demonstrates that it is the work of Kent. Kent did not always succeed so well as he did at the Horse Guards, and here, though there are fine features, especially in the Queen's Guard Chamber, there is striving after "bigness" which is assertive. The chimney-piece, with the Yeomen of the Guard as consoles, is ludicrous and quite out of scale; it is a bad piece of work and fails to impress the beholder. Passing through the room, we come out on to the Queen's Great Staircase. In the absence of drawings there is little to be said beyond that it is rather larger than the King's Staircase. The windows in the Kitchen Court make it look lighter. The ironwork is good and the way the risers are managed in profile is worth noting. From the landing to the right and left are the narrow galleries leading from the King's and Queen's apartments. The known as the Communication Gallery, on the west side of Fountain Court, was completed by Wren in 1699. The gallery on the north of the staircase is now known as the haunted gallery, but that, as Rudyard Kipling would say, is another story. The gallery leads into the Great Watching Chamber and Henry VIII's Presence Chamber finished in 1506. The Watching Chamber or Guard Room was an unusually large apartment with a long bow window, plaster ceiling, and tapestry walls. The gallery also led to the Chapel, or rather the Royal pew.

If we draw a centre line through the Chapel, pew, and Great Hall we can see that they have been planned in relation to each other. Unless Henry VIII. destroyed Wolsey's Chapel, &c. as well as the Great Hall, this is additional evidence that the Hall was not enlarged by him. The Chapel was refitted and altered by Wren, and its carving by Gibbons and inlaid

wood rederos remind us of Trinity Chapel, Oxford. The staircase to the Royal pew from the ground floor is spacious and good in detail. The view of the ceiling and the whole Chapel from the Royal pew is very striking.

I cannot refer to any of the other rooms in the Palace as they are but little known to me, but may just draw your attention to the Kitchens, which are well worth a visit. The Great Kitchen contains the utensils and the cooking appliances, which look as though they had been undisturbed since the cooks last used them. Notice the double arches over the chimney openings, the single keystone chiming for the relieving arch as well as the tone arch under with its joggle joints.

I have but touched the fringe of the subject, but I hope I have said just enough to kindle in you the desire to know more about these interesting buildings. In Hampton Court the student has a great store-house of architectural treasures. I have only had time to speak of the buildings in a cursory manner, but let me advise you to make separate studies of the chimney pieces, the fire-backs, and fire-dogs, the old furniture, consisting of bedsteads, chairs, curtains, and needle-work, old card tables, and a perfect collection of silvered looking-glasses and old china. Then there is the ironwork, wrought and cast, which is a subject worthy of special notice. And, further, there is one matter about which I had hoped to say something, viz.: *The Gardens*. These, with their enclosing walls, piers, gates, steps, and terraces, might form the subjects of many papers. All these treasures are so accessible, and sketching orders so easily obtained, that Hampton Court should long remain a prolific mine to the student. Those who have charge of the building, with the attendants of all ranks, are the most courteous and obliging you could find, and any one who takes an interest in the building they love is sure of their help. In conclusion, I must publicly thank Sir John Taylor for his great kindness in lending us the valuable plans, which even if not the actual work of Sir C. Wren himself, were those from which he worked, and on which he has sketched. Also for the elevations, which seem to be his original drawings, and which the Secretary, the Hon. Reginald Brett, kindly consented to have removed from his room for our inspection. I have already spoken of my indebtedness to Mr. Law, and though I do not agree with his architectural criticisms, the information and facts he has collected together makes his "History of Hampton Court" most valuable to the architect. I may say, for the information of those who cannot afford the larger work, that he has just published a handy and very complete condensed edition which every student should possess. Mr. Maule's beautiful drawings I must again refer to. There is a good plan of the later buildings and the southern garden, and many details for which I am indebted to him. The beautiful reproductions from the book I am editing with my friend Mr. Macartney on the "Later Renaissance in England," and some of the drawings intended to be published in it, Mr. Batsford, the publisher, has kindly sent for your inspection, and they may serve to show that he is determined to make this work one of the most important contributions to the subject.*

The Chairman said he supposed there was no building within the vicinity of London which had greater interest to architects than Hampton Court Palace. Mr. Belcher, as one who had studied Hampton Court Palace, and who had great enthusiasm for Wren's work there, must be regarded as an authority on the subject. In looking through Mr. Law's most interesting historical account of the way in which Hampton Court Palace was erected and added to, they could more readily understand the reason for the differences in the building and the additions that had been made to it, for they could really trace from the commencement the designs of those who carried out the work. It was really a most remarkable thing that one man should have had so much to do with such a large building as Wolsey had. No doubt we were indebted to Wolsey, owing to the interest he took in the Palace, for the foundation of a building which, although added to by Wren in

a totally different style, was of such complete interest and was characteristic, not only of the Tudor times in which it was commenced, but of the time in which Wren worked. If Wren had done what was thought right in the day of the Gothic revival, viz., to enlarge the building, and restore it in the original style, Hampton Court Palace would not, he was sure, have been so interesting, and certainly not so grand as it was made by Wren. He thought it was a matter of regret that funds were not forthcoming to carry out the grand schemes that Wren had in his mind. It was very interesting to see, thanks to her Majesty's Office of Works, and to Sir John Taylor, some of those designs that evening. Wren had a very grand scheme in regard to the Palace, but he never had an opportunity of carrying it out; in fact there was difficulty in getting money to pay for work that was done. In Mr. Law's book they were told that there was difficulty in getting the money for some of the beautiful iron-work and other work after it was carried out. Hampton Court Palace was a unique building, not only from an architectural but from a colour point of view, and it was no doubt because of that that the building was so much admired. From a colour point of view the building was remarkable, and architects and artists who went to the Palace admired not only the architecture, but the colour. In order to appreciate the arrangements of the building it was really necessary to understand some of the Court functions—the great State banquets, &c.—of the time. He found himself regretting that we had left behind us the days when it was possible to erect and keep up such grand buildings; things were very much more matter-of-fact now than they were then, and all the picturesqueness due to this State pagantry had been done away with. At the same time we should do all that was necessary to keep the Palace in a proper state of repair, and it was fortunate that the Office of Works took such care of the building. There was one cause of regret, however, viz., that some portions of the building served a different purpose now from what was originally intended. He thought it was in the reign of one of the Georges that the building was first divided up and made into residences for noble families, and, considering what had to be done to fit the apartments to such a purpose, it was a marvel that more mischief from an architectural point of view had not been done; and it was still more remarkable that the building had survived from the ravages of fire, although a year or two ago a fire did occur. Nothing aroused a stronger feeling among architects than that such a treasure should be exposed to the risk it was, and it was to be hoped that after the warning given by that fire means had been taken to prevent the recurrence of this danger. It would be a national shame if every means were not taken to safeguard the building.

Mr. E. Law, who was called upon by the Chairman, said that though there was some disagreement between the lecturer and himself in regard to Sir Christopher Wren's work at Hampton Court, he hoped that no one would go away with the impression that he was not a most enthusiastic admirer of Wren's work at Hampton Court. He had studied it a great deal, and he knew that there was an immense field for architects and those interested in art to study the detail, the plan, and the whole scope of the building. It was only those who knew the place thoroughly, only those who knew the uses the rooms of the Palace were put to, could understand the difficulties that Wren had to contend with in making his additions to the older part of the building. Only those who knew this, and had studied the extraordinary skill and genius with which Wren had accomplished his task. In his book his remarks had been deprecatory only of Wren's action in pulling down some of the older parts of the building. He was sorry that there was not at that time a Society for the Protection of Ancient Buildings, because we might have had preserved to us another part of the Palace quite as interesting as the Tudor part which Wren left standing. There was an idea in the minds of Wren and his master at one time not to touch the old Palace, but to build another one some distance off, at Hampton. Possibly the site would not have been so suitable and convenient as that at Hampton Court, but he regretted that Wren did not apply his genius—though possibly the fault was William III's, who had no regard for English traditions—to

adding a fine suite of State apartments to the building, but without unduly destroying the existing rooms, which were full of the most interesting work, and the most interesting historical reminiscences. Mr. Belcher had referred to Wren's proposal for very much enlarging the Palace beyond what it now is, and it was important that stress should be laid upon this, because what Wren had done was only a small part of what he intended, and what would have been done had William III. lived. There was plenty of evidence that a great deal was to be done towards the avenue in Bushy Park and also to transform the two first courts; and possibly if William III. had had his way there would have been no Tudor Hampton Court left; but he, the speaker, regretted that the grand entrance to Bushy Park was not built. The existing entrance was mean and inadequate. He must disagree with Mr. Belcher in regard to the chimneys in the Tudor portion of the Palace. These were ornaments to the whole design, growing out of the building without any disguising of the purpose they were intended to serve and they had been treated in a most masterly way. But let them look at Wren's part of the building, where they would see how much difficulty he had found in dealing with the chimneys in an adequate way. In one of the designs exhibited that evening the chimneys were put in, but in two others he did not show them at all, and it was very strange that in all the engravings of the building at this time—1703 to 1710—the chimneys in Wren's part of the structure were always omitted, though, of course, they existed. He (the speaker) considered that they formed a disfiguring element, rising as they did in a very awkward way along the balustrade, and he thought that that was an instance of the superiority of the Tudor treatment of the domestic buildings, though he said that without wishing to disparage Wren's treatment and the beautiful work he had accomplished. He sincerely hoped that architects would visit more frequently Hampton Court, for the facilities for study and enjoyment were unequalled anywhere else in England, and the Clerk of the Works, Mr. Chart, was always very ready to assist any one in research and study.

Mr. H. H. Statham, in proposing a vote of thanks to Mr. Belcher for his paper, said that the lecture was not only interesting, but it served to remind them that there was a great deal of history and architecture to be studied in the Palace, which, perhaps, some of them visited more as a holiday resort when they had an idle hour or two to spare on a sunny day in summer—and a more charming place at such a time he did not know. He must candidly confess that he was a Wolseyite. He admired the Tudor part of Hampton Court more than the Wren; and he wished that Wren had dealt more kindly with the older building, and had left some of those portions which he had pulled down—although he (the speaker) fully recognised, in the case of a new sovereign coming to a country and wanting a palace to live in, that the practical question of making it convenient and comfortable for him came first: that was the foundation of all architectural treatment. When he found students were invited to admire all Wren's work, he thought—would it not be better for them to think of it as architecture, to consider why they admired it. There was one part of Wren's additions which could be thoroughly admired, and that was the interior treatment of the quadrangle; and the reason for which it was treated. If the details were considered separately, it would be found that they had no very great interest: they were merely details such as could be seen in other great works of the period; but the manner in which the windows were massed together, not separately treated in a timid way, made the whole thing come out almost like a painter's sketch for the wall. In that respect he thought the quadrangle design was thoroughly admirable. But when he looked at the garden front, he thought— notwithstanding his admiration for Wren, whom he considered one of the greatest architects who ever lived—that if that particular front were thought of without the bias that Wren's name excited, it would be considered rather a tame design, wanting in skyline and flat in effect. As one matter of detail, he had always thought that the lines taken by the filling in of circular windows should be generated, so to speak, by the lines of the window frame, and the

* The following illustrations of the Palace have appeared in the *Builder*:—The Great Hall, from measured drawings by Mr. W. Womacott, October 17, 1891; the "Fountain Court," from drawings by Mr. P. L. Marks, March 24, 1888; and the Chimneys, October 27, 1883.—Ed.

space not cross-hatched without any reference to the lines of the window frames. That was one of the little points which might occur to them in studying the facade. It was the same defect that Robert Adam showed so often in his buildings, of having a large semicircular window with two upright mullions; the two posts clashed with the circular lines of the window, and the design did not in any way arise from the fact that the window was semicircular. In regard to the gardens at Hampton Court a very fine lesson could be learnt from them in the laying out of land around a large palace, although it was even finer and more complete in the original design than it is now. The garden near the Palace front was treated in a perfectly symmetrical way, and beyond that came what might be called the formal treatment of the forest. The garden and its parterres, which were purely artificial, were left here, replaced by ranges of trees, which in themselves were not artificial, but were arranged in artificial lines, forming a series of avenues radiating from the centre, so that the high artificiality of the garden combined harmoniously with the architecture of the Palace; while outside that were the free forms of the trees, still kept sufficiently in architectural lines to show that it was a park, and not wild country; and then, beyond that, was the wild country, the natural landscape. He had always thought that a very fine treatment, making the house the centre of the whole—an artificial centre, connected with the natural landscape by radiating avenues of trees. He thought that Mr. Belcher deserved their thanks for the interesting way in which he had dealt with the subject and for the illustrations which he had shown.

Mr. W. H. Seth-Smith briefly seconded the vote of thanks.

Mr. Percy Hunter said that the Palace was of great interest historically and architecturally. Historically, it seemed to be most associated with two names, Wolsey and William III., Wolsey being undoubtedly the greater man; Wolsey, as Mr. Law had shown, had not only built but had furnished the Palace with extreme magnificence. It was remarkable that in so short a time—in fact within the space of 160 years—the Palace, which was so magnificent for Wolsey and Henry VIII., should have become behind the age for William III. It was worthy of remark, as evidence of change of manners, that the building only existed in its original condition for about 160 years. He felt bound to add his protest against Wren's vandalism at the Palace, for it was much to be regretted that he destroyed so much that must have been of interest—and not only that he destroyed and pulled down most interesting parts of the building, but also, apparently, that he did not leave a record, or only a very slight one, of what he had destroyed. What most interested him architecturally was the chapel, and he had often tried to picture the condition in which Henry VIII. left it, and how the East end was finished. How valuable a plan of that would be at the present time! They must also regret the loss of the carved wooden stalls, which apparently were erected in the time of Henry VIII. He understood Mr. Belcher and Mr. Law to say that the ironwork at Hampton Court was made under one design and by one hand. He ventured to differ from that opinion, for there was such an immense difference between the refinement of the gates in the East front that lead into the gardens and the ironwork of the King and Queen's staircases, as compared with the very coarse details of the large gates known as the Lion Gates. There was a very great difference both in design and workmanship, and he thought that while Jean Tijou might be the designer and manipulator of the first two, it was Huntingdon Shaw who carried out the heavy and coarse detail of the other gates. While they owed very much to the Palace officials for the care that was taken of the building, he thought it was to be regretted that the gates in the Park entrance had been painted with a varnish paint, for the effect was most unfortunate. In regard to the battle of the chimneys, he knew of no more picturesque and beautiful effect than that which could be got from the roof of Hampton Court, especially when they were able to get a perspective view of the old Tudor roofs; and if they contrasted that view with that which they got from the same position of Wren's work he did not think that any one with any taste or feeling for archi-

tectural work would have any doubt as to the greater charm of the Tudor chimneys.

The vote of thanks having been put and carried by acclamation,

Mr. Belcher, in the course of a brief reply, said he did not wish to convey the impression that Mr. Law had any dislike to Wren's work. In regard to the chimneys, they were not omitted from Wren's drawings which he exhibited that evening, and if they would look at the photograph of the actual building, they would see that the effect of them was not at all bad. He drew attention to the fine example in Fountain Court. He quite appreciated what Mr. Statham had said in regard to the lines of the windows, though they had got accustomed to it in Gothic buildings, where it was very frequently seen.

The Chairman announced that the next meeting would be held on the 25th inst., when a paper would be read by Mr. F. W. Troup on "Lead Work, Plain and Decorative," with practical demonstrations.

The meeting then terminated.

Illustrations.

THREE CONTINENTAL THEATRES.

THE three theatres of which views are shown in the lithograph were among those specially referred to in Mr. Sachs's paper read at the meeting of the Institute of Architects on Monday.

The Vienna Court Theatre, generally known as the Hofburg Theatre, was the one which Mr. Sachs instanced, at the close of his paper, as the most adequate home of the drama, in an architectural sense, which had been erected, and as an example of the "radial" system of planning advocated by Semper.

We have before referred to the dispute as to whether the real credit of the design is due to Semper or Hasenauer. Semper was the architect originally commissioned, in 1869, to prepare the first sketches for the building, and he was afterwards, in 1871, appointed architect to carry it out, in collaboration with Hasenauer, and resigned in 1874 owing to disputes with his colleague. The probable fact is that the theatre represents Semper's general idea and Hasenauer's details; but the question is no longer of any special interest.

According to the official statement, 550,000l. was the cost of the building, which seats 1,475 persons.

The Municipal Theatre at Bromberg is a typical instance of a playhouse supported from the rates, in a town having a population of 36,000. It has been executed from the designs of a specialist in theatre architecture, Mr. H. Seeling, and it is a characteristic example of his work, both in respect to the clearness of plan and its architectural treatment. It is a "two-tier" house, with ample accommodation in the form of foyers, cloak-rooms, &c. The building operations only extended over eighteen months, namely, from May, 1895, to October, 1896, and the total cost of the structure was under 23,000l.

The present Municipal Theatre at Zurich replaces an old theatre destroyed by fire in 1890, and the building fund was raised by subscription within a few weeks after the catastrophe, so that the origin of the building must be ascribed to the liberality of the leading citizens, and the playhouse classed as a subscription theatre. Zurich, it should be remembered, has only a population of 27,000, but there are extensive suburbs outside the city area, and a considerable number of tourists pass through the town every summer.

The commission was not given to a Swiss architect, though there was a public competition for the design, but to the Vienna specialists, Messrs. Fellner & Helmer, the same architects who designed the People's Palace in the same town. Here, again, we have a characteristic example of one of the many theatres erected by these architects. The accommodation provided includes seats for an audience of 1,230 (as well as some standing room), and these are distributed on a steep area and three tiers. Work was commenced on this building in 1890, and the opening performance took place in 1891.

ILLUSTRATIONS OF SOME SCOTTISH COUNTRY HOUSES.

We have devoted a considerable portion of our lithograph illustrations this week to a

series of houses, some of them entirely new, some of them adaptations of or additions to old houses, by Mr. R. S. Lorimer, of Edinburgh, who has made a special study of the type of simple but picturesque country houses.

The following are Mr. Lorimer's notes on several houses illustrated:—

"MOONIE," ABERDEENSHIRE.

The existing old house is shown on drawings. The additions have been designed so as to leave the old house as much as possible detached, to tell its own story, the entrance to the new house being through one of the vaulted rooms of the old house.

There are traces of the existence of an old garden—some old fruit trees and yew tree. The new gardens have been designed as part of one scheme with the house, stables, &c., in the design the type of the old Aberdeenshire gardens has been followed.

GATE HOUSE, BALCARRES.

This gate house was built last year at entrance to a new approach recently formed at Balcarres House, Fife. It is built of the local black whinstone, harled and whitewashed, the roofs covered with old blue slates. The roof is surmounted by a stone figure.

The gate-pillars, walls, &c., are being carried out this year.

SIX HOUSES AT COLINTON, MIDLOTHIAN.

These houses have been built within the two years.

As they form a group at the junction of roads, they have been treated in the same manner. They are built of stone, harled and whitewashed, with red tile roofs.

Plans have been laid out so that the parlours command the fine view of the Pentlands, and the dining-room and drawing-room have, in most cases, been made to communicate by wide doors, which slide back, thus getting the effect of a large room.

In each case the garden was thought out in conjunction with the plan of the house.

ST. MARNOCKS, CO. DUBLIN.

This house is situated about ten miles from Dublin, and is within a few hundred yards of the sea.

As the situation is very exposed the building was kept low, and a large enclosed flower garden was formed on the sheltered side of the house; along one side of this garden, communicating with the house, an extensive range of conservatories was erected.

The house is built of local bricks and grained dressings. The floors are fireproof throughout. Part of the drawing-room, and the kitchen, belong to a former house.

The house is lit with electric light. The ceilings of the main stair-hall, vestibules, and dining-room were modelled in plaster by Mr. Priestley, and the walls of the places are finished in oak and inlay.

A pair of gate lodges, terraces, &c., were carried out. The works were completed all a year ago. Mr. R. S. Lorimer is the architect.

COMPETITIONS.

OFFICES FOR THE URBAN DISTRICT COUNCIL, EASTLEIGH.—The drawings in this competition were sent in only on Monday last, but an award has already been made. The premium of fifty guineas (to merge in commission) has been allotted to Mr. Mitchell & Gutteridge, of Southampton, the second premium of twenty guineas to Messrs. Colson, Farrow, & Nisbett, of London, and Winchester. The cost of the building is limited to 4,500l.

THE SURVEYORS' INSTITUTION.—A short record of the discussion which took place on Monday the Surveyors' Institution, on Mr. A. A. Hudson's paper, entitled "Surveyors as Arbitrators," is given over until next week for want of space. A greater part of the paper appeared in our issue of January 29.

NEW REDOS, ST. PETER'S CHURCH, SUDBURY.—New redos, erected from the designs of the architect Mr. G. F. Bodley, A.R.A., has just been dedicated at this church.

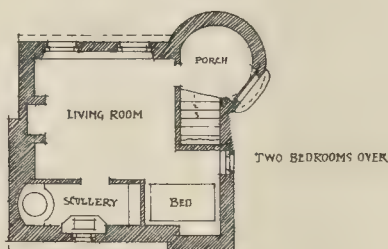
APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.—A list of applications under the 1894 London Building Act, brought up by the Building Act Committee at the last meeting of the London County Council, is postponed until next week for want of space.



BALCARRES

GATEHOUSE & NEW ENTRANCE
FOR THE EARL OF CRAWFORD & BALCARRES

VIEW FROM THE NORTH WEST



SCALE OF 10 5 0 10 20 30 FEET

GROUND PLAN

R. S. LORIMER ARCHT^{RO}
49 QUEEN STREET EDINBURGH

VIEW FROM THE SOUTH EAST

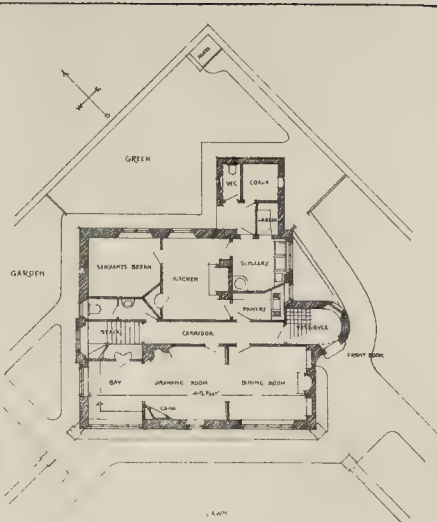
THREE



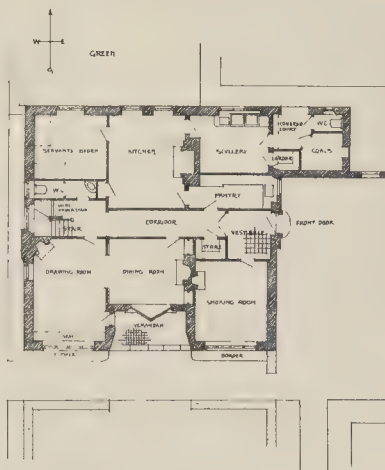
AGES AT COLINTON R-S LORIMER ARCHITECT
49 QUEEN ST EDINBURGH



J. J. Dean Del.

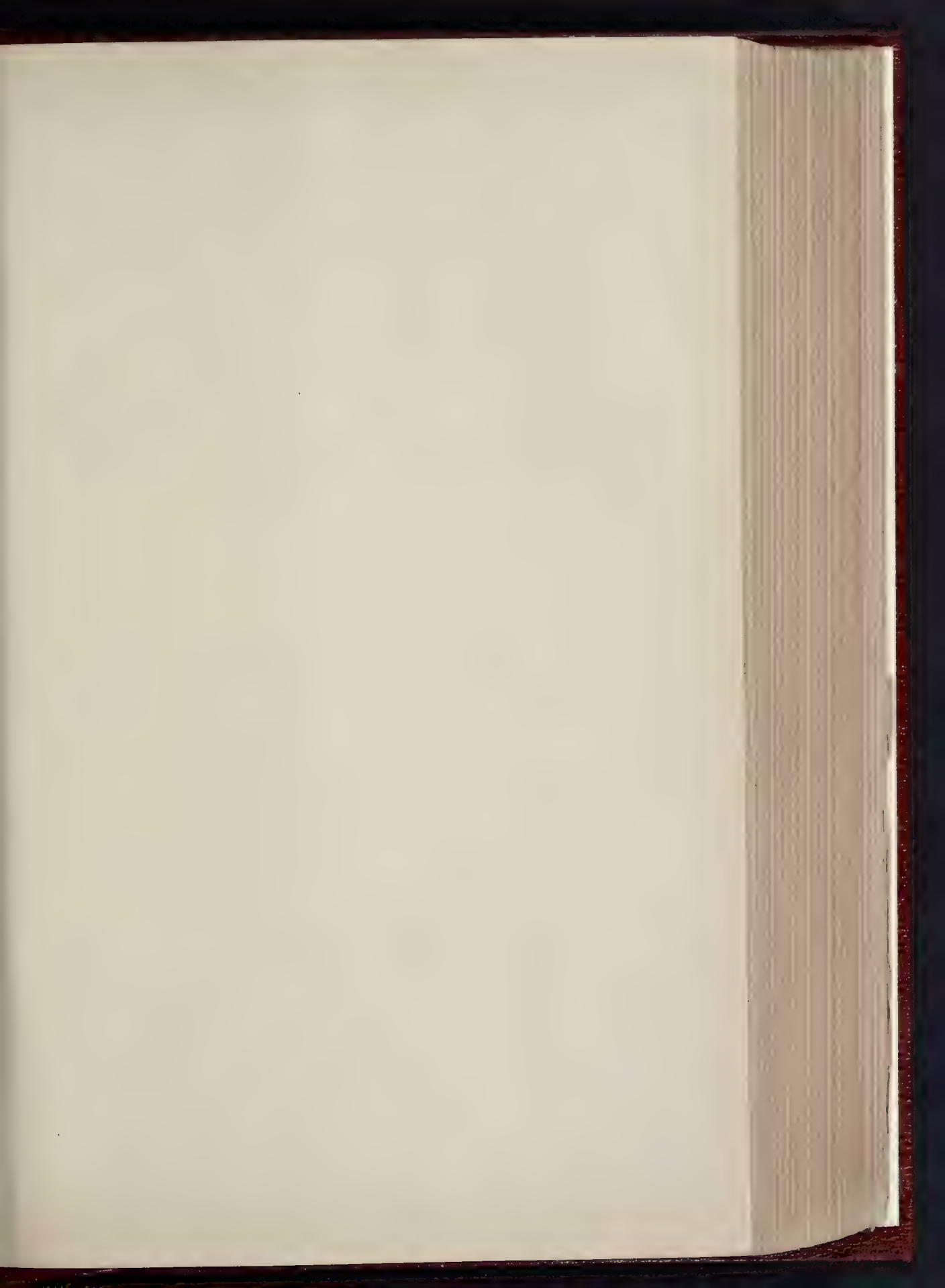


FOR MISS GUTHRIE WRIGHT



FOR MAJOR MEARES



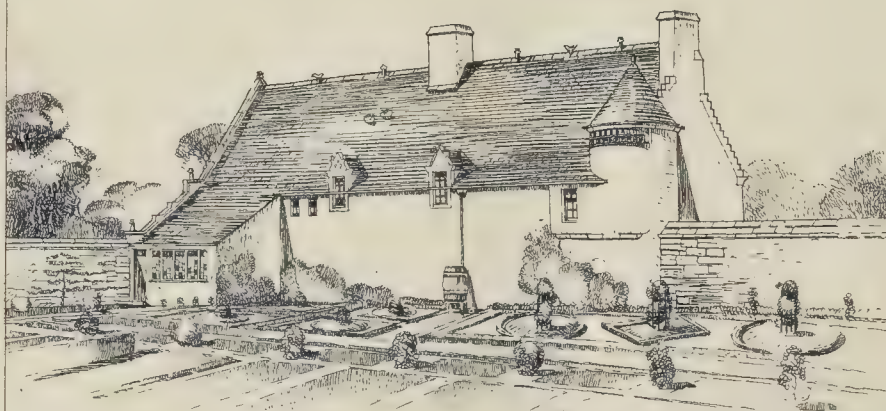




THE NEW HOUSE.

MOUNIE ABERDEEN-SHIRE

RESTORATION OF OLD HOUSE
STABLE, GARDENS & FOR M



VIEW OF PART OF STABLE BUILDINGS
FROM THE GARDEN



OLD HOUSE

ADDITIONS : WITH
SETON OF MOUNIE
J. Lorimer. ARCHITECT &
10 QUEEN ST. EDINBURGH

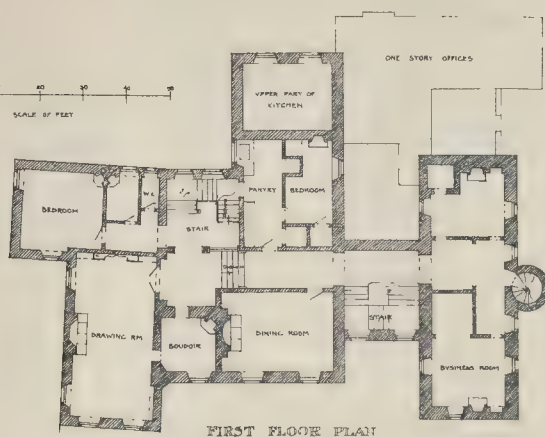
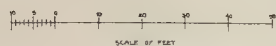


HOUSE - AS - EXISTING.



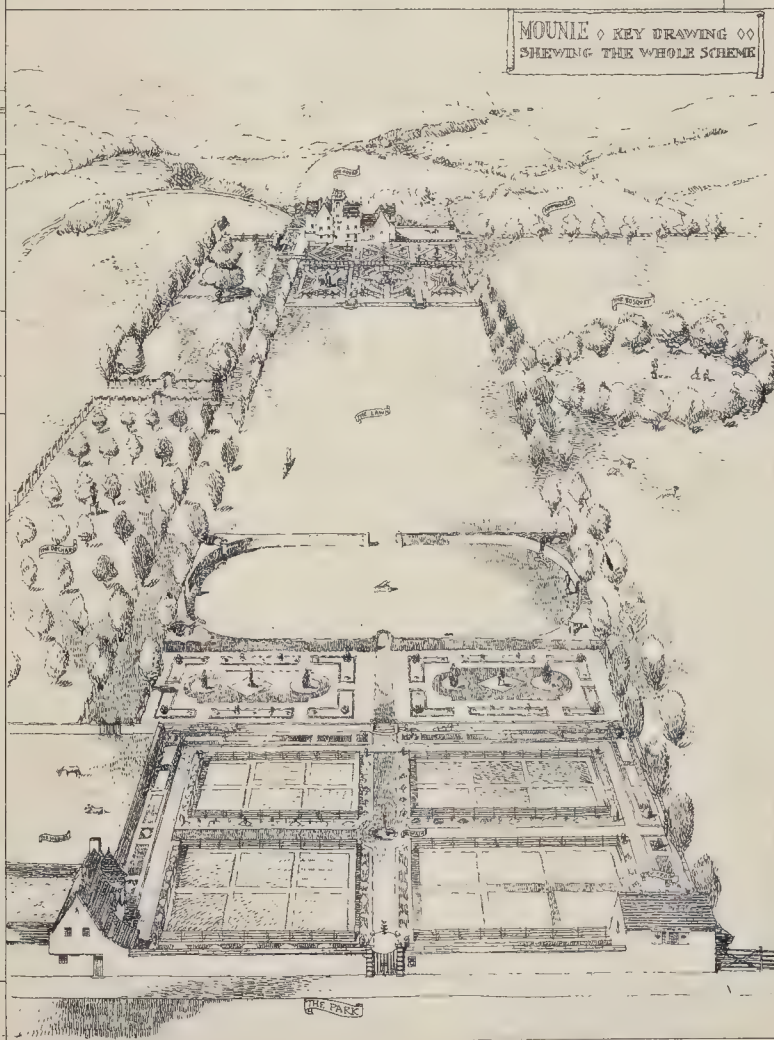
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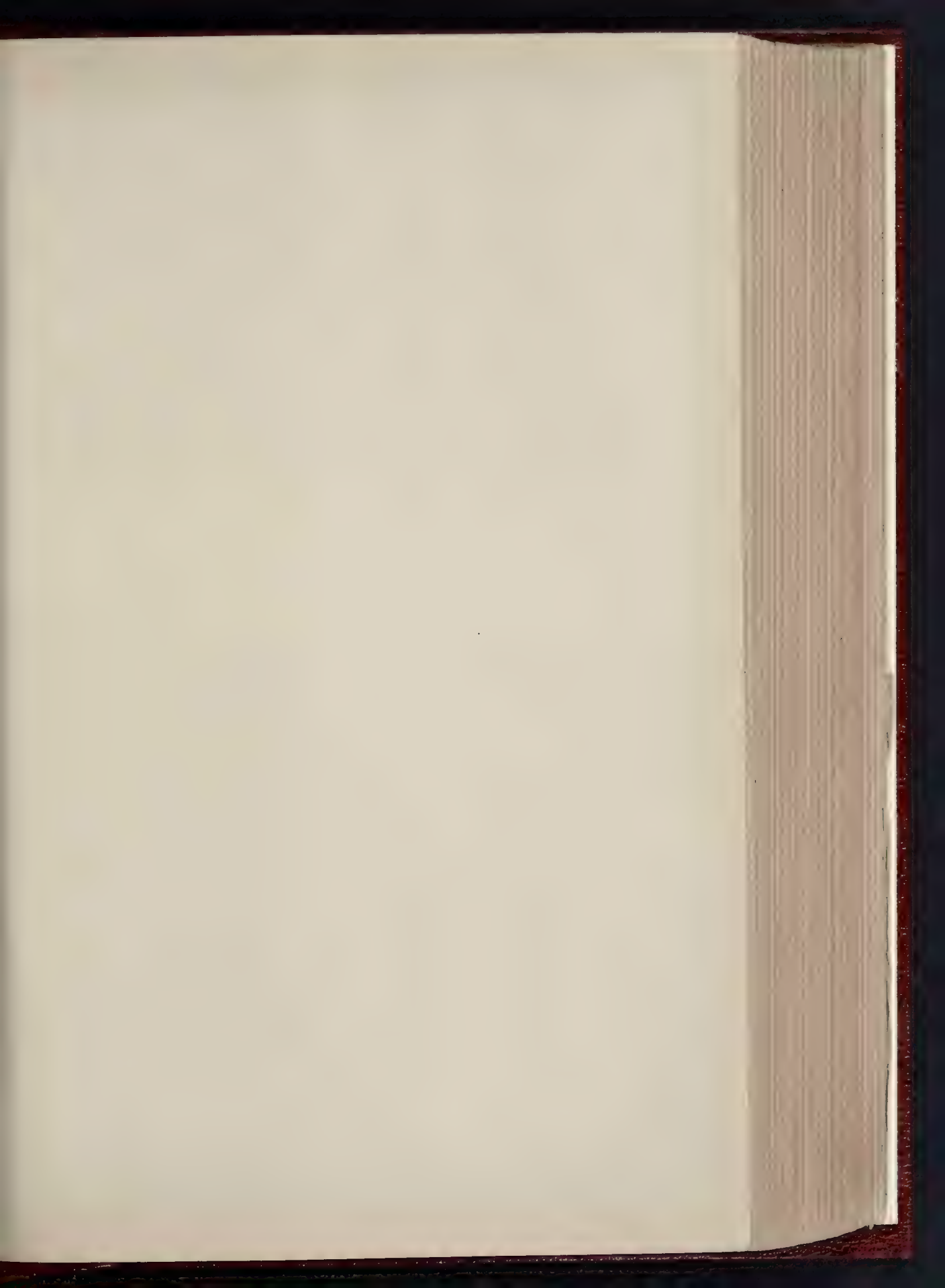
SCALE OF FEET

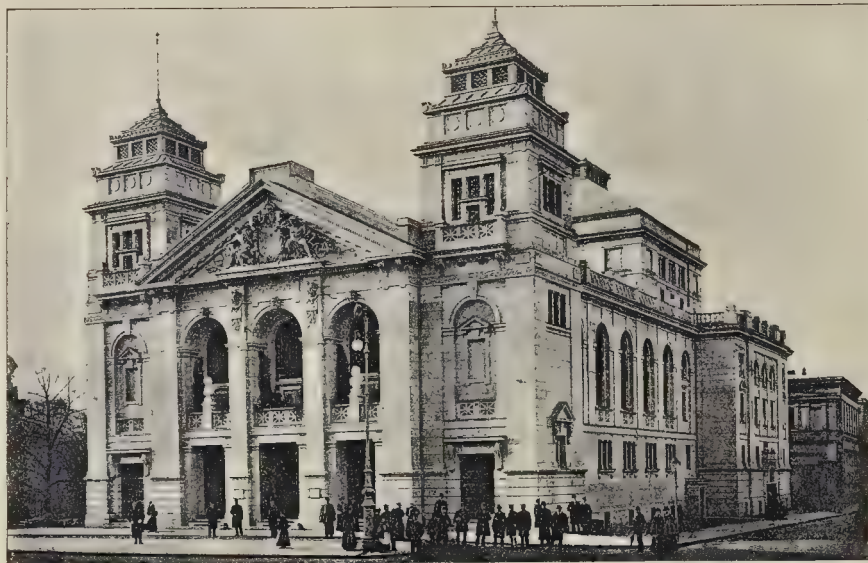


FIRST FLOOR PLAN

MOUNIE ♦ KEY DRAWING 00
SHEWING THE WHOLE SCHEME



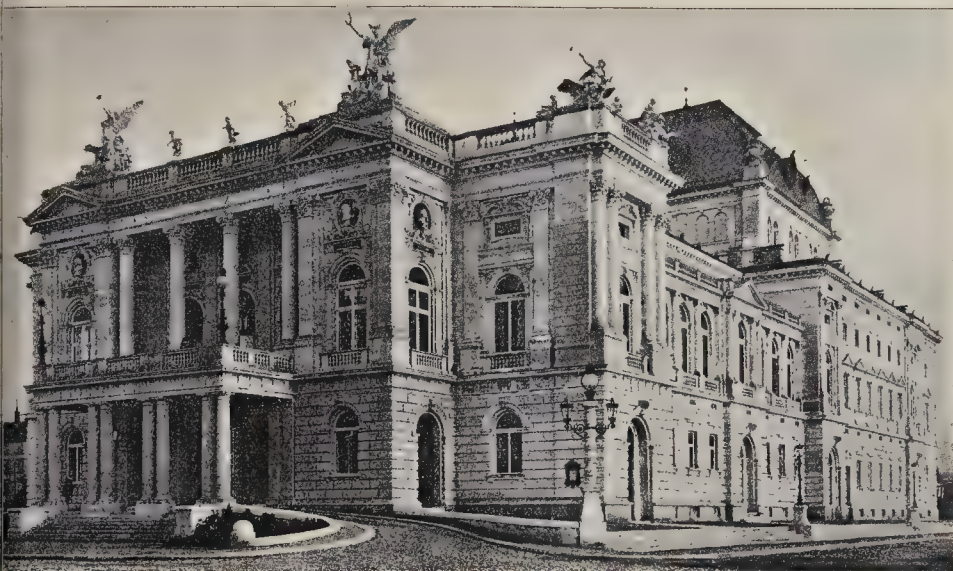




MUNICIPAL THEATRE, BROMBERG.—HERR H. SEEING, ARCHITECT.

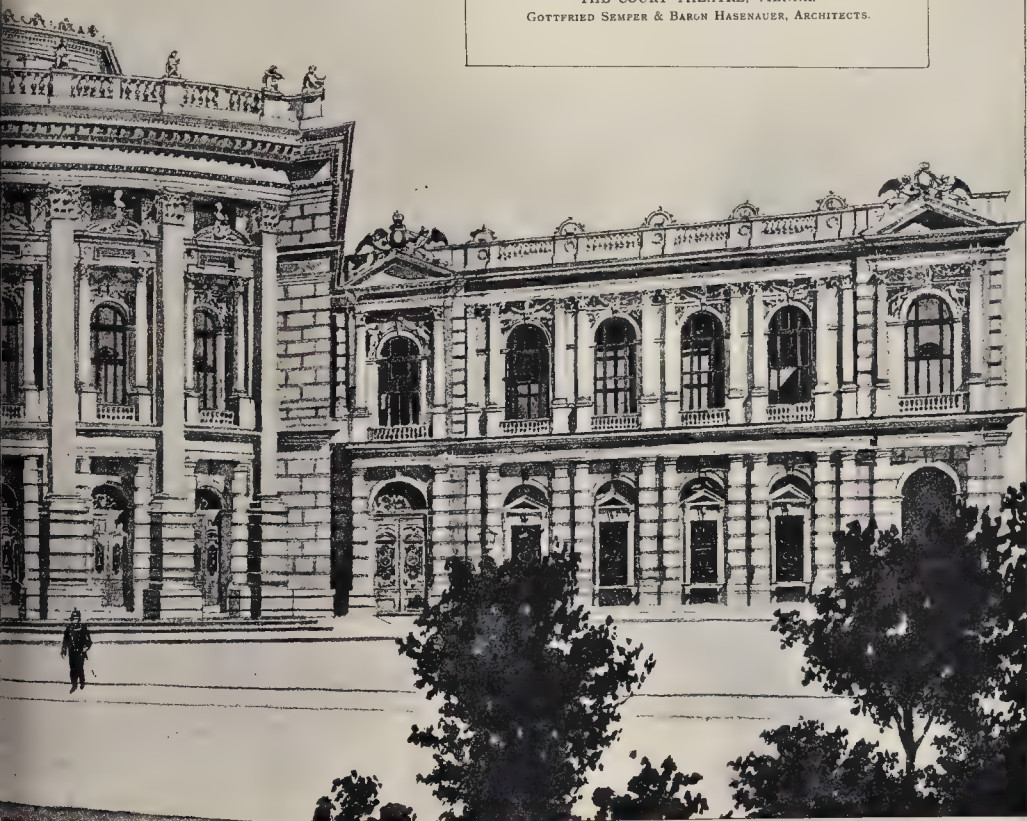


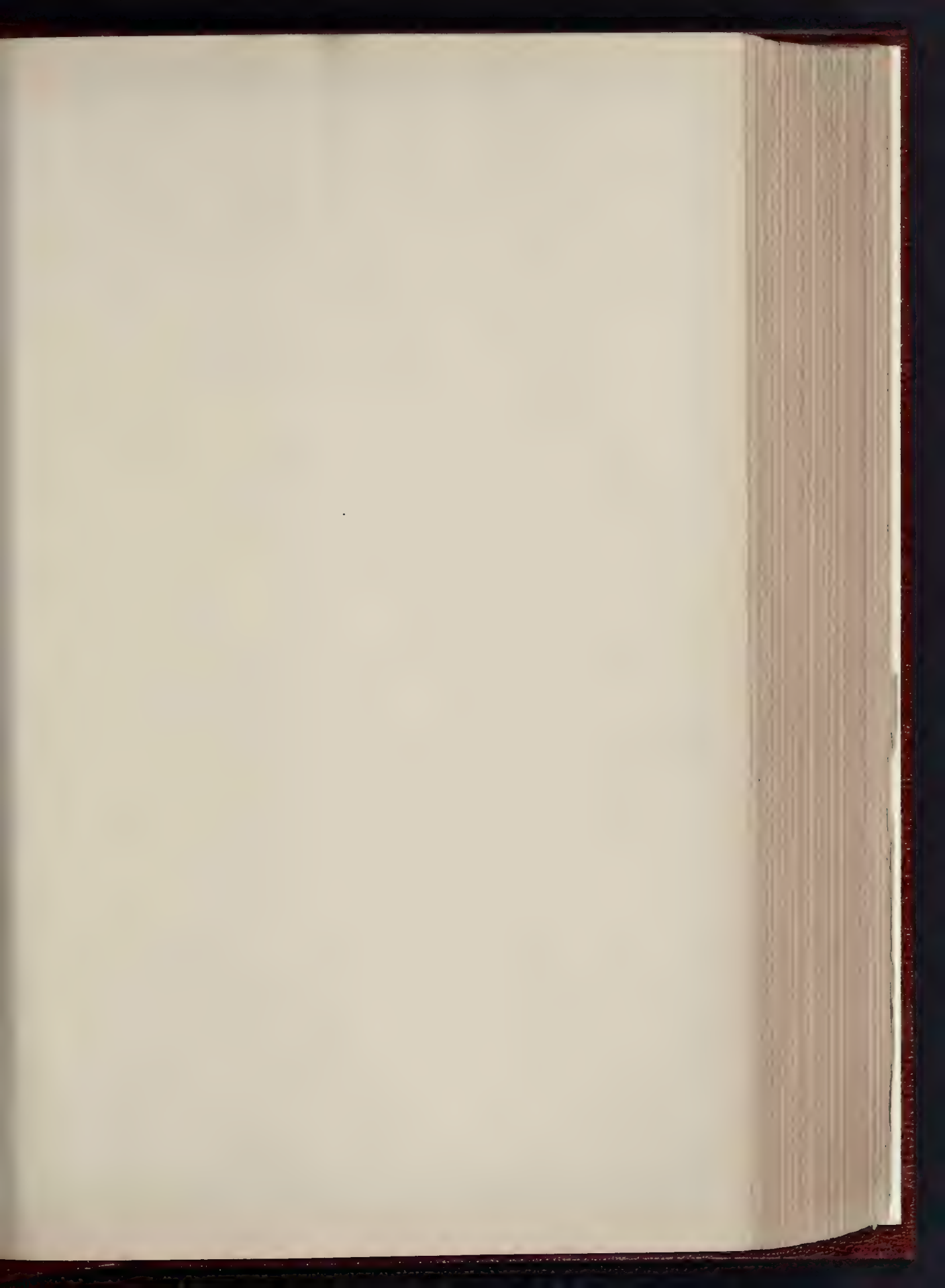
VIEWS OF SOME MODERN THEATRES: (IN ILLUSTRATION)



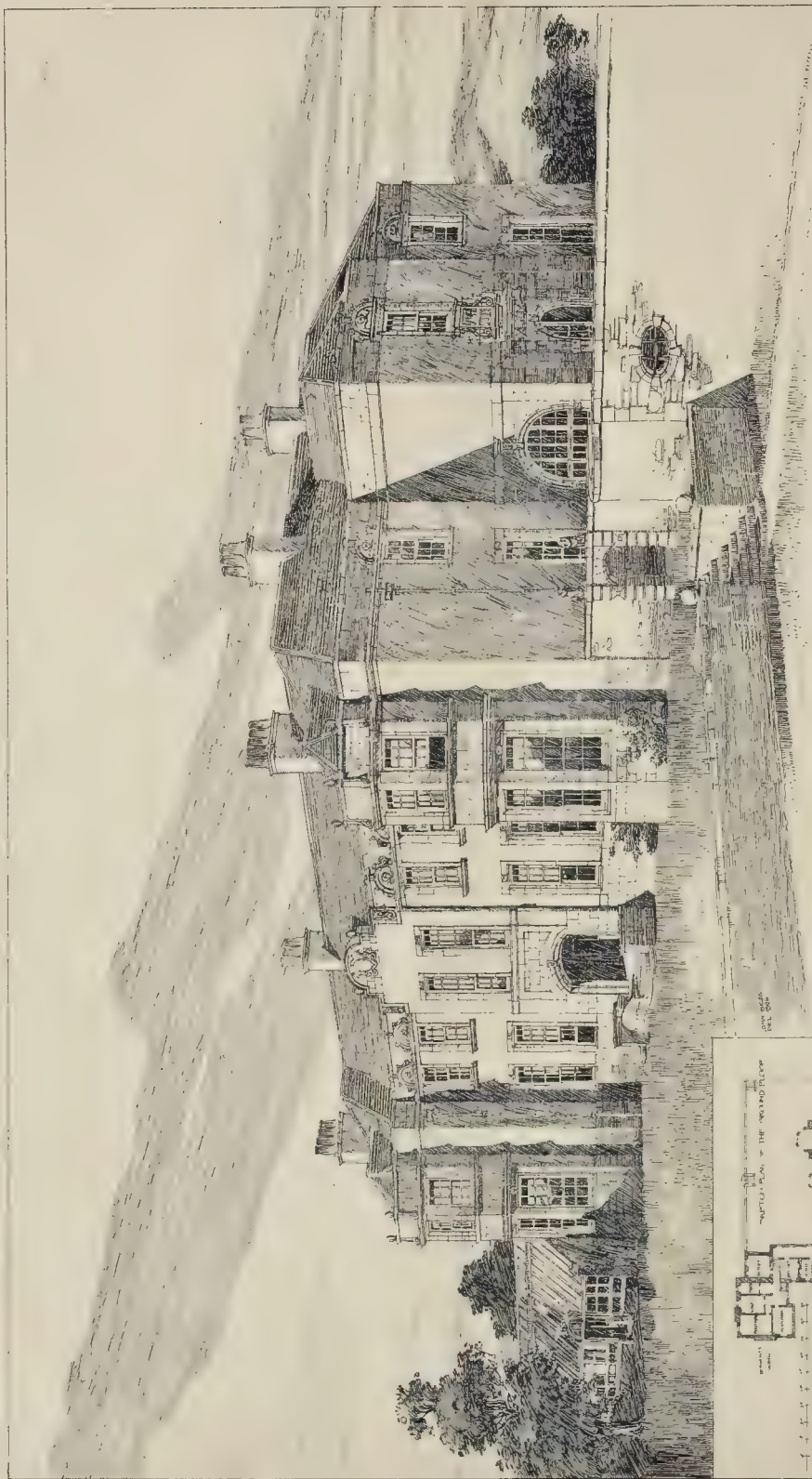
MUNICIPAL THEATRE, ZURICH.—MESSRS. FELLNER & HELMER, ARCHITECTS.

THE COURT THEATRE, VIENNA.
GOTTFRIED SEMPER & BARON HASENAUER, ARCHITECTS.





THE BUILDER, FEBRUARY 12, 1898.



FOR JOHN JAMESON ESQUIRE D/L

R. S. LORIMER, ARCHITECT.

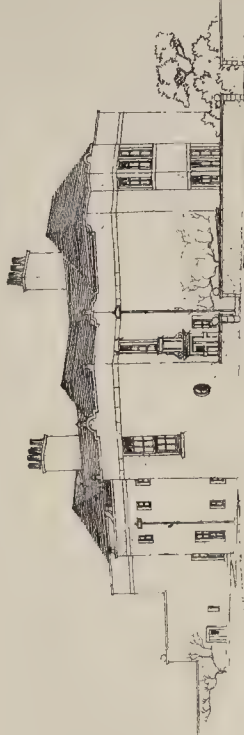
40 QUEEN STREET, DUBLIN, E.C.H.

ST. MARNOCK'S: CO. DUBLIN.



MISS GUTHRIE-WRIGHT'S, 147 BONEY DOUGLAS

THREE SMALL HOUSES
AT COLINTON
RESIDENT ARCHT. QUEEN-ST. EDIN.



DE DOMMIE'S



PLAN OF THE GROUND FLOOR OF DE DOMMIE'S HOUSE



PHOTO UTHO SPRAGUE & CO. 445 EAST HARRING STREET FIFTH LANE E.C.

MAGAZINES AND REVIEWS.

THE Architectural Review (Boston), Vol. IV., No. 8, gives as its principal illustrations the accepted design for the New York Public Library, by Messrs. Carrère and Hastings; complete geometrical drawings. It is a building in a modified classic style, with a good deal of originality, but we cannot say we like the effect of the low block of building at each end of the principal mass; it looks too much like an adjunct, and wants dignity of effect; nor does the plan afford any satisfactory explanation of this treatment.

The *Architectural Record* continues Professor Goodyear's exposition of the intentional distortion of Italian buildings of the Early Renaissance period, which has now reached its climax. The leaning tower of Pisa was built so for effect, the Baptistery is out of plumb for the same reason, and the well-known bulging of the angle of the façade of St. Marks, where the pushing-out effect of the arches, one would have thought, must be obvious to a child, is actually given as an example of "a delicate forward lean and return bend"! The author will hardly advance his reputation or that of the magazine in which he writes by such preposterous nonsense. Signor Melani contributes a short article on Palladio, who should have been treated in a more monumental article if at all. The number also includes a description of the new Library of Congress and an article on school buildings in New York.

The *Atlantic Monthly* contains an article of some interest by Mr. Russell Sturgis, on "The True Education of an Architect." The main point in the article is that the man who is in training to be an architect should "love building, he must love heavy stones, and stout, solid walls, and handsome timbers handsomely cut and framed. . . . What should be taught to the young man meaning to be an architect is, primarily, the how and the why simple, every-day building, such as has been practised for centuries, is adapted to all those materials which his own country furnishes, and is according to all those processes which his countrymen recognise." This is good, wholesome teaching, and the article is worth reading.

The *Gazette des Beaux-Arts* contains the second of a series of articles by M. Charles Yriarte on Scamozzi's designs and drawings for theatres and other building at the little town of Sabbionetta, where Scamozzi played pretty much the same part which Palladio played at Vicenza. The same number contains the second of a series of articles by M. Pierre de Nolhac on the history of the decorations of Versailles, with illustrations.

The *Art Journal* contains no article of the highest class of interest. "The Decorations of the London Clubs" is continued, but this kind of article seems more suited to a general illustrated paper than an Art magazine. There are two short articles dealing with art workmanship, those on "Art for Winter Evenings" and "Arts and Industries of To-day."

The *Magazine of Art* contains a finely illustrated article by Mr. Walter Crane on "Needle-works as a mode of artistic expression."

The *Studio* (January 15) devotes an article to the works of Mr. Moira, whose original and poetic work, the "King's Daughter" we drew attention to when it was at the Royal Academy a year or two ago. Mr. Moira's work includes designs for stained glass, and the illustrations given in this article speak highly for his artistic gifts and his versatility. The number includes a chapter on a modern English country house, of which Mr. Arnold Mitchell is the architect, and on "Some Old Wrought Iron-work," by Mr. E. F. Strange.

The *Engineering Magazine* contains an article which ought to be of special interest at present, on the equipment and organisation of a city fire department, with special relation to the New York fire service, and with illustrations of some of the apparatus employed, which for convenience and readiness of action are much in advance of those known in London. The number also contains an article on hot-water heating for buildings, by Mr. J. J. Blackmore, which we presume represents the subject from an American point of view.

Of the two principal quarterly reviews, the *Quarterly* has a rambling article on "English Art in the Victorian Age," which represents little more than the current ideas of the day, and the writer starts with an entire misconception of M. de la Sizeranne, the French critic, in paraphrasing his sentence "Il y a une peinture anglaise" by the words "There is an English

school of painting," inasmuch as that is exactly what the French critic proceeded to deny; our fault being, in his eyes, that we have no "school." The *Edinburgh* is a very good number, but none of the articles touch on subjects within our province.

In the *Fortnightly Review* Mr. Ford Madox Hueffer writes a short article on the Millais and Rossetti exhibitions, which contains some shrewd critical remarks, but in which Millais is much underrated and Rossetti much exaggerated; the author, as indeed he half confesses, being hardly in a position, for reasons of social and family connection, to form an unbiased estimate of Rossetti.

The *Century Magazine* contains an article on "Ruskin as an Oxford Lecturer," by Mr. James Manning Bruce, who seems to have culled from his memory all the extravagant, *outré*, and preposterous sayings he can recall, and asks us to bow down before the author of them. Surely it is time this form of lunacy spent itself.

Among the contents of *Harper* are an essay by Du Maurier on "Social Pictorial Satire," mainly a reminiscence of Leech and his work; an article on Stuttgart, with illustrations by Mr. Pennell; and one on "The Duc d'Aumale and the Condé Museum."

The department in *Scribner* headed "The Field of Art" is entirely occupied with a consideration of the influence of "English movements in Decorative Art" on America and France, in two short articles signed respectively "E. R. P." and "R. S." Both are well written and impartial, and recognise both the strength and the weakness of the school of decorative art of which Morris may be said to have been the founder.

The *Pall Mall Magazine* contains a popular article on the "Bookbinders Art" by Mr. A. L. Marlow, one on St. Michael's Mount, with some good illustrations, and the continuation of Sir Walter Besant's essay on South London, in which there is, however, more imagination than history.

The *Revue Générale* opens with an article on Pisa, by M. Arnold Goffin, with eight illustrations of architecture and painting. The article itself, however, is historical rather than artistic.

The *Essex Review* contains a long and largely illustrated article on "Some interesting Essex brasses"; also one on the Harveys of Saffron Walden, with a frontispiece illustration of Gabriel Harvey's picturesque old house.

The *Quarry* contains an article, the second of a series, on "Applied Geology," by Mr. Vincent Eldsen, with diagrams, and an article on the Technology of Portland Cement, translated from *L'Industria*.

LONDON AND PROVINCIAL BUILDERS' FOREMEN'S ASSOCIATION.

THE annual dinner of this Association was held at the Holborn Restaurant on Saturday evening last, Mr. Henry Holloway presiding, supported by over 100 members and friends of the Association.

The loyal toast having been honoured,

The Chairman, in proposing the toast of the evening, "Success to the London and Provincial Builders' Foremen's Association," said that the employers had their organisations to protect their interests, the workmen had their trades-unions for the same purpose, and it was only right that builders' foremen, who came between the two other parties, should also have an organisation of their own. He was glad to notice that their aim was to improve their own positions educationally, as well as financially, and that desire, he was sure, would commend their Association to others. There was a very real need for better education in the building trades; it was a deplorable fact that masters had to pay the wages of skilled mechanics to those who were not worthy of the name, and it was very trying to the employers to feel that they had men associated with them who were not earning their money and who, if they were remunerated, with abruptly threw up their work. It was fortunate that trade was so good, but he hoped the time would come when every man who professed to be a skilled mechanic would be able to carry out his work without so much instruction from those above him. He was glad to know that the Association met occasionally to discuss subjects of interest to foremen, and that from time to time they visited works

in progress, for by these means they could not fail to learn many points of value to them, especially the younger men. He thought the country was at last waking up to a knowledge of the great importance of technical schools and institutes, but one of the great needs in such institutes, so far as the building trade was concerned, was competent instructors. Many of the present instructors were not at all capable of imparting knowledge in the proper way. Many able men, with much theoretical knowledge, were associated with these institutes, but what was required was some one to visit from time to time those in charge of these institutes and advise them as to the best methods of giving instruction to young men. Much of the instruction given at the present time was worse than useless, and if an Association like the Builders' Foremen's could arrange with the Technical Education Board to visit the technical institutes in order to see that the most practical methods were adopted, a great amount of good would be sure to follow, and he was glad to hear that some proposal of that kind was under the consideration of the Association. Their Association was not a provident institution, and so they did not clash with any existing body, though they did assist members in distress; but the Association was mainly an educational institution. As they invited men like himself to join as honorary members, he should be glad if they would accept him in that capacity.

Mr. G. Morley, the President, in reply, referred to the origin and history of the Association, which was formed in May, 1894. It was not a provident institution, but it existed for the purpose of mutual help and education. They desired very much to promote a closer union between builders' foremen and their employers, and to use their influence to bring about a satisfactory settlement of any disputes which might exist between masters and men. The Association hoped to obtain the support and recognition of the employers, and they hoped that if at any time the masters were in need of competent foremen they would apply to the Association. They had meetings on the last Saturday of each month, when papers were read and discussed by their members. He hoped that the apprenticeship system would be revived, for they had no means at present of knowing what a man's qualifications were until after they had engaged him, when very often he was found to be incompetent. The best way to avoid that was to encourage a revival of the apprenticeship system. At present men who had served only two or three years at a trade went on to a job as fully qualified workmen, and the masters had to pay them the full rate of wages; that was an injustice to both the masters and the qualified workman, and he advocated the establishment of two classes of workmen—a first and a second class. All qualified men would be placed in the first class, and those who were not so qualified would go into the second, receiving a 3/4d. or 1d. an hour less in wages, until they had made themselves competent to enter the first class. The Association was endeavouring to raise the standard of the various branches of the building trade. He hoped that other masters would follow Mr. Holloway's example and become honorary members, for he hoped that a very strong link would connect the employers and the foremen.

The Chairman then proposed "The Building and Kindred Trades," referring, in the course of his remarks, to the difficulties under which masters now carried on their business; but though they had many troubles to contend with they had pleasures also, and he, for one, found the building trade a very interesting one. He thought that they would sympathise with the masters in the recent engineering dispute—and the men also, for they had suffered a good deal during the dispute. On the whole the trade of the country was bright and encouraging, and they had every reason to congratulate themselves.

Mr. Cook responded; and the other toasts were "The Press," proposed by Mr. W. N. Pennington, and acknowledged by our representative; "The Chairman," proposed by Mr. Morgan, vice-president; and the "Visitors," proposed by Mr. Knowles, and responded to by Mr. B. Carter.

BRITISH ARCHAEOLOGICAL ASSOCIATION.—The British Archaeological Association will hold its next summer meeting at Peterborough. The proceedings commence on July 14 with an inaugural address by the Bishop of Peterborough.

ARCHITECTURAL DRAWINGS FOR THE
PARIS SALONS.

The days for receiving architectural drawings for the Paris Salons are, for the "Old Salon" (*Société des Artistes Français*), from the 1st to the 5th of April; for the "New Salon" (*Société Nationale des Beaux-Arts*) from the 12th to the 14th of April. Drawings for the Old Salon, the one which devotes the most space to architecture, should be addressed to "Monsieur le Président de la Société des Artistes Français, Galerie des Machines, Avenue La Bourdonnais, Paris (Seine)." Drawings intended for the New Salon may be similarly addressed to the President of the "*Société Nationale des Beaux-Arts*," also at the "Galerie des Machines," as the two Salons (as already stated in our columns) will both occupy the "Galerie des Machines" this year, and probably till after the 1900 exhibition; but English architects will do better to send to the Old Salon, which has always made architecture a much more important feature in its exhibitions than the New Salon.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. Basil Champneys read a paper to a meeting on the 1st inst. of the members of this Society, taking as his subject "A comparison of the claims of the Gothic and Renaissance styles." Mr. John Ely presided. Mr. Champneys described the chaotic condition in which architecture was left at the end of the last century, and some of the ephemeral phases which followed the lapse of tradition. He said the main currents of architectural revival had been on two lines, Gothic and Renaissance, and he traced in some detail the mode of development which each of these rival styles underwent. A considerable proportion of the architectural enterprise of the last thirty years had been devoted to a combination of the elements of the two styles, either by a reversion to one or other of the many types of transitional style developed in the past or by deliberately combining anew ideas and features natural to both. He was far from saying that the hopes of the future might not be bound up in some such compromise, but up to the present time it seemed to him that efforts of this kind had been too incoherent and too scattered to make any considerable permanent impression. The main object of his paper was to break a lance in vindication of the Gothic—a great style of architecture which, after holding the field for some considerable time, showed signs of passing out of fashion. In that style more than any other were perfectly displayed principles which must be obeyed in any style which claimed to fulfil the highest conditions of architectural effect. As to the question whether there was a probability of a new style being formed, he said they would in any case have to wait for it for centuries. A vote of thanks was given to Mr. Champneys on the motion of Mr. C. Heathcote, seconded by Mr. T. Chadwick.—*Manchester Guardian*.

YORK ARCHITECTURAL SOCIETY.—The annual dinner of the York Architectural Society was held on the 29th ult. in the "White Swan Hotel," Pavement. Mr. George Benson, President of the Society, took the chair, and there were also present Mr. William Emerson, Hon. Secretary, Royal Institute of British Architects, Mr. George Corson, President of the Leeds Society, and others. The Chairman, having proposed the Royal toast, Mr. George Corson proposed "The York Architectural Society," and said that the provincial societies had been the product of the last twenty years. Before that time architects scarcely knew each other, and these societies had been the means of social union and of bringing together the friends of their art.—The Chairman, in response, said that their Society was instituted sixteen years ago, and of its five founders three were present that night. He alluded to the union of the Society with the Royal Institute of British Architects, and said he wished their Society could do more for the Institute. Six Associates and two Fellows during the time the Society had existed was not very much. It was their privilege to live in a city where the spirit of the ecclesiastical, civil, military and domestic life of the past found material expression in the buildings around them. Each of those buildings showed that the men of the past were

able to produce some very good work. Those old buildings, even in decay, were very interesting and appealed to them even more eloquently than words could. Their picturesqueness, peculiar outlines, the use of the timber in the natural form, all combined to make a picture in the streets for every passer-by to gaze upon, and to think about. He regretted that it was felt necessary to sacrifice the old gateway at the entrance of College-street for public improvements, for it was the only remaining gateway of the walled-in Minster close. Having alluded to the various styles of architecture to be found in York, the President alluded in feeling terms to the deaths of Mr. R. N. Yeomans and Mr. T. P. Bulmer.—Mr. H. Perkin proposed "The Archbishop of York, Clergy, and Ministers of all Denominations," and the Rev. G. H. Hewison responded.—Mr. A. Pollard proposed "The Royal Institute of British Architects." Mr. W. Emerson responded. He said it had never been the idea of the Institute to become an educational body. That was more than they could possibly entertain. Their object was to attend first to the professional interests of their profession at large, and their action in matters of that sort was strengthened by the alliance of the provincial societies. The Institute had always had the idea of becoming an examining body, and that, during late years, had been fairly well accomplished, and the examinations were now held regularly. Also, with regard to the alliance with the provincial societies, their object was to encourage social intercourse with and knowledge of their professional brethren. He went on to say that he had been much struck lately with the deterioration in English architecture and the introduction of so much pretty elaboration and meaningless ornament. Why was this deterioration, and why was there often so much difference between the buildings erected and the drawings shown? Was it because they were anxious to make pretty drawings to win competitions and please their clients, or was there really a decay of good taste? If so, why was it? Was it because of the decadence of the nation? It had set him thinking that the decadence of architecture and the decadence of nations was usually synchronous, and in ancient Greece, in the later years, this was the case when it arrived at the Corinthian style and made its buildings very elaborate, but exceedingly beautiful. This only happened when the nation was going in for a course of luxury and effeminacy; and shortly after the nation was wiped out. The Roman nation began with severe but beautiful buildings. Towards the later period, when they came to the Composite order of architecture, with its elaborate decoration and workmanship, they were in the most luxurious and vicious state of society the world had seen. From that period he supposed that they could say with truth they began to decline and fall. The Mahomedan architecture culminated in the Alhambra, a gorgeous piece of work, but not to be compared with the early work in Egypt and North Africa, and shortly after that time they gradually wasted away in power. After the time of Henry VII. the English nation went through the fiery trial of the Reformation, and since then we had certainly a simpler style of architecture; but during the last twenty or thirty years we seemed to be falling away; we seemed to be getting vicious, and architecture had gone mad. Was it that the nation was on its wane, and the taste becoming vulgar? Did it mean that we had to become purged by the great war they heard of as shortly to come? He had great faith in the destiny of the British nation, and if they did have a great war, he trusted they would come out of it purified as a nation, and purified in taste with regard to architecture.—Mr. E. T. Felgate proposed "The Corporation of York and the prosperity of the City" and Mr. Councillor T. H. Storey responded. At the conclusion a vote of thanks was passed to the Chairman, on the proposition of Mr. Cripp.—We have received the annual report of the Society, which has completed its sixteenth session. Among the papers read during the session were those on "Haddon Hall," by Mr. A. J. Penton, on "Heraldry," by the Dean of York, and on the "History and Development of York Minster," by the Rev. Canon Argles. A Society's prize has been awarded to Mr. F. E. Wootton, of York, for a "Design for a Vicarage, with Parish-room attached."

EDINBURGH ARCHITECTURAL SOCIETY.—The first meeting of the session in connexion with

this Society was held on the 2nd instant, in Dowell's Rooms, George-street. Mr. W. N. Cumming, the President, occupied the chair. After the usual business had been transacted, the awards in the various prize competitions held during the past session were announced. These were as follows:—Hon. President's prizes for "A design for a branch Free Library, Museum, and Picture Gallery"—First, Mr. W. A. Mellon; second, Mr. W. Fairbairn; President's prize for "six sheets of measured work"—Mr. J. H. Rutherford; Vice-President's prize for "Design for veredas and altar frontal for a country church"—Mr. P. E. Nobbs. Mr. Cumming announced that Mr. John Kinross, A.R.S.A., had consented to accept the hon. Presidency. He then proceeded to sketch briefly the work proposed to be undertaken by the Society during the session upon which it had entered.

GLASGOW INSTITUTE OF ARCHITECTS.—A quarterly general meeting of this Institute was held in the Rooms, 187, Pitt-street, on the 27th ult. Mr. John J. Burnet, A.R.S.A., occupied the chair. A recommendation by the Council that the President and late President be elected to act with the City Engineer in formulating the conditions of competition for Springburn Halls was approved of, and these gentlemen were declared elected. It was intimated that for the Phebe Hearst Architectural Competition for the University of California, the following articles had been received, and are now on exhibition in the rooms of the Institute, 187, Pitt-street, viz.:—A plaster relief map, a set of photographs, topographical maps of the grounds, and programmes of the competition. The President referred to the recent election of the President of the Royal Institute of British Architects as a Royal Academician, and the secretary was instructed to convey the congratulations of the Glasgow Institute to the Royal Institute of British Architects on the event.

NORTHERN ARCHITECTURAL ASSOCIATION.—A meeting of the members of the Northern Architectural Association was held on the 2nd inst. in the meeting room, Art Gallery, Newcastle, the President (Mr. F. W. Rich) in the chair. It was announced that arrangements were in progress for the removal of the Association to premises more permanent and suitable to their requirements. Mr. Geo. J. Bulmer, of Leeds, read a paper entitled "To Ancient Rome," in which he gave an account of an architectural student's Italian holiday. His paper was illustrated by lantern views.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of this Society was held at the School of Art on Tuesday evening, when Mr. Hugh Stannus delivered a lecture on "Proportion." He mentioned and explained, by means of illustrations and numerous sketches on the blackboard, the various theories of proportion—arithmetical, geometrical, harmonic, triangular, constant difference, &c.—as applied to architecture and other arts, showing that each contained some truth, but not the whole truth on the subject. He demonstrated that the quality of proportion subsisting in art is not positive, but negative, and that objects which are not in had proportion are in good proportion, within certain defined limits, in varying degrees; and he further showed the application of this theory (his own, which he had evolved after testing and finding the others to be inadequate) to various objects of three dimensions.—It was announced that the next lecture will be on March 8, by Mr. C. Castle, on "English and Foreign Timber for Building and Decoration," and that the prize drawings of the Royal Institute of British Architects will be exhibited in Sheffield on March 9, 10, and 11.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The fifth meeting of the present session of this Association was held at the rooms in Sackville-street, Piccadilly, on the 2nd inst. Mr. Thomas Blashill (hon. treasurer) occupied the chair. Mr. Collier exhibited two prints from engravings on copper by Albert Glacken-ent, of playing cards used in the seventeenth century, the cards being the eight and ten of swords. The Rev. H. J. Dukinfield Astley, hon. secretary, exhibited several arrow heads and early flint implements found in Norfolk, also a good example of a farthing of the Irish money of Charles I. Mr. J. Chalkley Gould read a paper upon a somewhat unusual and

seemingly, from its title, rather dry subject, viz., "A Naval MS. of the Time of James II." The MS. is in the form of a small bound volume, beautifully written, and is full of curious information concerning the ships of the British Navy in the latter days of the last of the Stuart Kings of England. The writer of the book is unknown, but from internal evidence, it seems highly probable that it was prepared under the personal supervision of Samuel Pepys upon his resumption of the office of Secretary of the Admiralty, in 1684, after five years of retirement, by the request of Charles II. The MS. is full of curious information and valuable statistics as to the size, tonnage, armament, and so forth, of the ships of His Majesty's navy; but much historical information is also to be gleaned from its pages. It may be mentioned that the largest ship of Pepys's time mentioned is the *Britannia*, 46 ft. long, 47 ft. broad, and 1,540 tons. The paper was illustrated by a fine engraving of the naval engagement off Cape la Hague, from a painting by B. West, showing very correctly the type of ship of the period; also by an original pen and ink drawing of the stern and quarter of a man-of-war, by "Della Bella," a Florentine artist (born 1610, died 1664), contributed by Mr. Patrick, hon. secretary. A facsimile of the illustration of the Dutch Fleet in the Medway and Thames, taken from the Hill of Billingham by Evelyn, the original of which is in the Bodleian Library at Oxford, was also exhibited.—The hon. sec. announced that the Annual Congress would be held at Peterborough, by the invitation of the Mayor and Corporation, in July next, commencing on the 14th, and concluding on the 20th, both days inclusive. The Lord Bishop of Peterborough had consented to be President, and would deliver the inaugural address.

ENGINEERING SOCIETIES.

THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—At a recent meeting of this Society, held at the Hotel Victoria, Northumberland-avenue, a paper on "Some Methods of Heating Air," was read by Mr. W. N. Twelvetrees. The paper was illustrated by numerous diagrams demonstrating the manner in which certain natural laws directly affect the questions of heating and ventilation, and showing the various systems adopted and some of the defects frequently causing failure in practice. Want of space prevents our giving this week any further report of the paper, to which we may return in another issue.

SOCIETY OF ENGINEERS.—The first ordinary meeting of the Society of Engineers for the present year was held on the 7th inst. at the Royal United Service Institution, Whitehall. Mr. George Maxwell Lawford, the President for 1897, occupied the chair, and presented the premiums awarded for papers read during that year, viz.:—The President's Gold Medal to Mr. R. F. Grantham for his paper on "Sea Defences." The "Bessemer Premium" to Mr. P. M. Faraday for his paper on "The Rating of Engineering Undertakings." The "Rawlinson Premium" to Mr. R. E. Middleton for his paper on "The Pollution of Water and its Correction"; a "Society's Premium" to Professor M. W. Umney for his paper on "The Compression of Air by the Direct Action of Water"; and a "Society's Premium" to Mr. J. Croll for his paper on "Filter Presses for Sewage Sludge." Mr. Lawford introduced the President for the present year, Mr. William Worby Beaumont, to the meeting, and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year. Mr. Beaumont then delivered an address.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Dr. Collins (Chairman) presiding.

Loan.—On the recommendation of the Finance Committee, it was agreed to lend the St. Pancras Guardians 2,000l. to defray the cost of alterations and additions to the Leavesden Schools.

The Works Department.—Mr. Corbett asked Lord Welby, Chairman of the Finance Committee, whether he was correctly reported in a daily paper as having said, "As I warned the Council at the time, the Finance Committee is not able to exercise a direct control over the small details of the business of the Works

Department. The coming election must determine the question as to the continuance of the Department. A majority for the Moderates will probably mean its total abolition, while a victory for the Progressives must be followed by the re-establishment of the Works Committee, or some new device for ensuring the proper control of the Department."

Lord Welby replied that the paragraph certainly represented in sense and meaning what he said. It would be impossible for the Finance Committee to have control over the details of work at Belvedere-road, the chief depot, but they were quite able to exercise financial control over the financial part of the works.

Patent Fire Appliances.—The General Purposes Committee reported as follows, the recommendation being agreed to:—

"The Fire Brigade Committee have informed us that Commander Wells, the chief officer of the Fire Brigade, has obtained provisional protection for two fire appliances which he has designed. The appliances are (1) a nozzle, and (2) an arrangement for carrying a supply of water and compressed gas. The Fire Brigade Committee are of opinion that, subject to further experiments now being made by the chief officer, the appliances will be of service to the Brigade, and they accordingly suggest that the chief officer should be authorised to take out patents for both the appliances. We understand that the chief officer desires to place his invention entirely at the disposal of the Council. We recommend that the Council do grant permission to Commander Wells to take out patents for the appliances referred to, on the understanding that the patents are placed entirely at the disposal of the Council; and that the solicitor do prepare such agreement as may be necessary in the matter."

Protection from Fire in London.—The Council resumed the discussion on the Fire Brigade Committee's report, containing proposals for increasing the number of fire stations and appliances to a great extent. Last week, when the question of adopting the estimate of 197,000l. was before the Council, Colonel Ford moved, and Mr. Thornton seconded, an amendment to add the words, "But that it be referred to the Committee to consider and report as to whether the Government should not be approached with a view of utilising to a greater extent than at present the services of the police force in connexion with the extinction of fires, and also whether the money contributions from the fire insurance offices and from the Government ought not to be increased."

Colonel Rotton (Chairman of the Committee) said the effect of the amendment was to delay the scheme.

Mr. N. W. Hubbard contended that the contributions of the insurance companies and of the Government were inadequate.

The amendment having been rejected upon a show of hands,

Lord Welby moved a further amendment:—"That the question of the method by which the Fire Brigade expenditure is to be defrayed be referred to a joint committee of the Finance Committee and the Fire Brigade Committee for consideration."

This was agreed to as an addition to the Committee's recommendation, which, as amended, was thereupon adopted. The other recommendations of the Committee, relating to the provision of fire stations in various parts of London, were also agreed to.

Taxation of Ground Values.—The consideration of the recommendations of the Local Taxation Committee was resumed, and the following was agreed to without discussion:—

"That, as the present system of Exchequer contributions from the taxpayer to the ratepayer by means of the Exchequer grants appears to operate so as to withdraw from Londoners more than it returns to them, no system of Exchequer contributions distributed to the whole country upon the present basis of division ought to be accepted on behalf of London."

The Committee further recommended:—"That it is desirable to substitute as local revenue the inhabited house duty and land tax in London and other counties (adjusted as suggested in the statistical officer's memorandum) for the share of probate duty and beer and spirit duties now transferred, and that in that event it will be desirable that County Councils should have power to propose from time to time, subject to approval of Parliament, schemes for amending the present incidence of inhabited house duty."

Mr. Shaw Lefevre moved an amendment to refer the recommendation back, on the ground that the scheme of relief proposed by the Committee required further consideration. Mr. Costelloe agreed to accept the amend-

ment, which was carried on a division by 50 votes to 42.

The next recommendation was agreed to, as follows:—"That it is desirable that the question of requiring the owners of empty tenements to pay (as is done in the City of London with regard to the sewers rate) the whole or part of the ordinary rates should be raised in connexion with the evidence to be given before the Royal Commission."

It was further recommended that, having regard to the impossibility of locating all movable property, no suggestion should be made to the Local Taxation Commission with regard to the local rating of such property.

An amendment by Mr. Urquhart was rejected, and the recommendation was adopted.

Mr. Shaw Lefevre moved:—"And that attention be called to the unequal grants to schools under the Voluntary Schools Act, 1897, and to the very serious wrong done to London and other urban districts by the Agricultural Rates Act, 1896, and that in the opinion of the Council it would be most unjust to renew that Act in 1901."

Earl Russell seconded the motion, which was carried by 45 votes to 37; and it was agreed that Mr. Costelloe should give evidence on behalf of the Council before the Commission.

Telephone Service.—The Highways Committee recommended:—"That, with the view of obtaining an investigation with regard to the telephone service in London, similar to the inquiry recently held as regards that service in Glasgow, the Council do make an application under the Telegraph Act, 1892, to the Postmaster-General for a licence empowering the Council to provide an independent municipal telephone service for the County of London." To this Alderman Beachcroft moved as an amendment:—"That a communication be made to her Majesty's Government pointing out the desirability of an investigation with regard to the telephone service in London, and asking that the Select Committee appointed by the House of Commons in 1895 to consider and report on the telephone service may be re-appointed." This was rejected, and the recommendation of the Committee was, on a division, carried by 44 to 31.

New Fire Station at Lewisham.—The Fire Brigade Committee reported as follows, the recommendation being agreed to:—

"The Council will remember that during the summer recess tenders were invited by public advertisement for the erection of a new fire-engine station in High-street, Lewisham, in substitution of the existing inconvenient station at Rushey Green. Only one tender, that of Messrs. F. & M. Patrick, amounting to 14,015l., was received, and this tender, being considerably in excess of the architect's estimate, was not entertained. After the receipt of the tender, the chief officer suggested a few slight alterations in the drawings of the proposed building, and the architect reported that the adoption of these suggestions would have the effect of increasing by 120l. his estimate of 12,710l. based on the bills of quantities. We thereupon referred the revised estimate of 12,830l., with the drawings, specification, and bills of quantities, to the Works Manager, who reports that he is not satisfied with the estimate. Under these circumstances, the only course open is to again invite tenders for the work. We accordingly recommend—That tenders be invited by public advertisement for the work of erecting a fire-engine station in High-street, Lewisham."

Sewage-contaminated Oysters and other Shell-fish.—The Public Health Committee reported as follows:—

"On July 27 last we submitted to the Council a letter from the Town Clerk of Brighton asking the Council to affix its seal to a memorial to the Local Government Board, praying for legislation for the purpose of minimising the dangers to which the public are exposed through the consumption of sewage-contaminated oysters and other shell-fish. In view of the statements made by medical officers of health in London that they had grounds for suspecting that oysters had been the cause of enteric fever, the Council decided to support the application of the Brighton Corporation, but without suggesting the particular lines which such legislation should follow; and a letter in accordance with the Council's resolution was addressed to the Local Government Board. The Town Clerk has since written to say that the memorial has been adopted by twenty-seven of the thirty-three great towns invited to join in the application, and that the President of the Local Government Board has agreed to receive a deputation representing the memorialists at an early date, of which notice will be given. As the Town Clerk wished to know whether any members of the Council would be able to accompany the deputation, we requested our

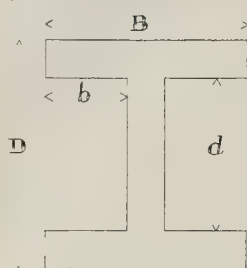


Fig 1

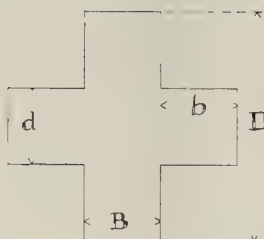


Fig 2

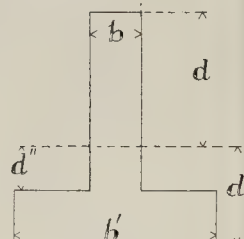


Fig 3

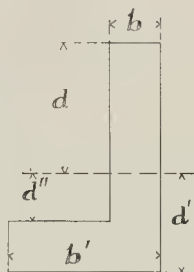


Fig 4

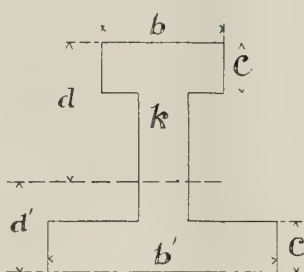


Fig 5

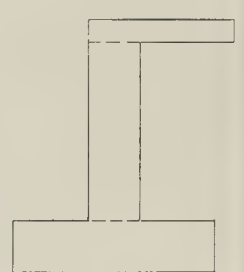


Fig 6

Chairman and Vice-Chairman to do so, and replied to that effect. We have also, at the Town Clerk's desire, addressed a letter to each of the members of Parliament representing London constituencies, explaining the objects of the memorialists, and stating that his presence with the deputation would be highly esteemed; and the replies received have been communicated to the Town Clerk. We report these facts for the information of the Council."

Proposed Greenwich Tunnel.—The Bridges Committee reported as follows, the recommendation being agreed to:—

"We have to submit the drawings, specification, and quantities which have been prepared in the Engineer's department for the works in connexion with the construction of the Greenwich footway tunnel. In doing so, we have to call the attention of the Council to the fact that the work will have to be carried out under the Thames by means of compressed air, and is of an exceptional character. It therefore appears to us to be expedient that only the tender of a firm of high standing and that has had experience in such work should be accepted, as it is necessary that when the work is commenced it shall be carried through without difficulties arising as to the capability and experience of the firm carrying out the contract. Under these circumstances, we suggest that we should be authorised to invite tenders on behalf of the Council from such firms as we may think desirable, including, as far as possible, those firms who tendered for the Blackwall Tunnel, as well as those who have since then carried out similar work, the number to be invited not to be less than six. The tenders, when received, will, in accordance with the usual practice, be opened at a meeting of the Council. We recommend—That the drawings, specification, and quantities for the proposed Greenwich footway tunnel be approved, and that the Bridges Committee be authorised to invite tenders for the work from such firms as they may deem expedient."

The Council adjourned at 7.25 p.m.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—VII.

THE next formula of which our student will probably desire to have an example of the working is that which we gave for the deflection of a beam, as under:—

$$D = \frac{W l^3}{EI}$$

as given in Chapter IV. E is the modulus of elasticity, which may be thus explained:—

The modulus of elasticity is the load which

would stretch a uniform bar to twice its original length, or shorten it to zero, if it were assumed that the ratio of the amount of stretch or compression bore the same relation to the load as it does within the limit of elasticity. Within the limit of elasticity a uniform rod of any given material stretches or shortens equally under equal conditions of load.

This fact does not hold good in all cases beyond the limit of elasticity of the material; but, assuming that it did do so, then the modulus of elasticity is as stated above.

The student will remember that we have already pointed out that material differs considerably in its quality, it is therefore not surprising that the modulus of elasticity is given by various authors at different values for the same materials. But we give below a table of moduli of elasticity for different materials, which may be taken as a fair average:—

Cast iron.....	5,400 tons per square inch to 10,000 tons per square inch.
Wrought iron.....	8,000 tons per square inch to 17,500 tons per square inch.
Steel.....	13,000 tons per square inch to 18,500 tons per square inch.
Fir.....	700 tons per square inch.
Oak.....	450 tons per square inch to 900 tons per square inch.

Although we must assume for the present that the student is unacquainted with the Theory of Moments, still, as the factor I in our formula stands for the moment of inertia, we must give some definition and information as to what is meant by the moment of inertia, premising that, if the student finds it difficult of comprehension, he would do well to leave this for the present until we have hereafter explained the Theory of Moments.

The sum of the products for all the fibres, in any given section, of the area of each fibre, multiplied by the square of its distance from the neutral axis, is called the moment of inertia. It follows, therefore, that whatever the form of the cross section may be, the moment of inertia of the whole area about any given neutral axis equals the sum of the moments of inertia of the several parts about the same neutral axis. This is a useful deduction, as from it we are able to find the moment of inertia of any section of irregular outline if we can subdivide the irregular area into regular parts. Thus, an irregular shaped beam, made up of a series of rectangles, as fig. 6 in the diagram, has its moment of inertia about its neutral axis equal to the sum of the moments of inertia of the

rectangles of which it is composed about the same neutral axis.

We will now give the moment of inertia of a few well-known figures.

Square. $I =$ Fourth power of side divided by 12, where any side or diagonal is vertical.

Parallelogram if rectangular, or otherwise when the neutral axis is parallel to either of the sides. $I =$ Breadth multiplied by cube of depth divided by 12. The breadth must be measured parallel to the neutral axis, and the depth at right angles to it.

Hollow Square or Rectangle.

$$I = \frac{(B \times D^3) - (b \times d^3)}{12}$$

where B and D are the greater, and b and d the lesser breadth and depth.

Circle. $I =$ Fourth power of radius multiplied by 0.7854.

Semi-circle. $I =$ Fourth power of radius multiplied by 0.1098.

Ring. $I =$ Difference between fourth power of radii multiplied by 0.7854.

Ellipse with long axis vertical. $I = \frac{(\frac{D}{2})^3 \times 0.7854}{2}$, where d is the shorter and I the longer axis.

Elliptical Ring with long axes vertical. Let L & S be half the longer and I & s half the shorter axis, then $I = \frac{[(S \times L^3) - (s \times I^3)] \times 0.7854}{36}$.

Triangle. $I =$ Base multiplied by cube of perpendicular height and divided by 36. This base is that side which is parallel to the neutral axis.

Sections of the forms given in the accompanying figures are also of common occurrence, and their moments of inertia are as follows:—

$$\text{Fig. 1. } I = \frac{B D^3 - 2 b d^3}{12}$$

$$\text{Fig. 2. } I = \frac{B D^3 + 2 b d^3}{12}$$

$$\text{Figs. 3 and 4. } I = \frac{b d^3 + b' d'^3 - (b' - b) d''^3}{3}$$

$$\text{Fig. 5. } I = \frac{b d^3 - (b - k) (d - c)^3 + b' d'^3 - (b' - k) (d' - c')^3}{3}$$

The moment of inertia is plainly independent of the material of which the beam consists, of the span, and of the manner in which the beam is supported or loaded, and is the same for all beams of a given cross section.

Having given this much explanation, we can proceed to work out an example. What deflection would be produced by a load

10 tons at the middle of a rolled steel joist 15 ft. span, 12 in. deep, 5 in. wide, average thickness of flange $\frac{1}{2}$ in., weight 30 lbs. per foot?

Our formula is $D = \frac{n \cdot w \cdot l^2}{E \cdot I}$ and here $n = \frac{1}{2}$, $w = 10 \times \frac{1}{2}$ weight of joist. Weight of joist = $15 \times 30 = 450$ lbs.

$\frac{1}{2} \times 450 = 225$ lbs. = say 0.1 ton.

$\therefore w = 10 \cdot 1$, $l = 180$, $E = \text{say}$, 15,000 tons.

I (fig. 1 = $\frac{5 \times 12^3}{12} - (2 \times 2 \cdot 3 \times 11^3)$

$\therefore D = \frac{\frac{1}{2} \times 10 \cdot 1 \times 180^2}{15,000 \times \frac{5 \times 12^3}{12} - (2 \times 2 \cdot 3 \times 11^3)}$

$= \frac{2 \times 10 \cdot 1 \times 180 \times 180 \times 180}{15,000 \times [(5 \times 12^3) - (2 \times 2 \cdot 3 \times 11^3)]}$

$= \frac{2 \times 10 \cdot 1 \times 18 \times 18 \times 6}{5 \times (8,640 - 6,126)}$

$= \frac{20 \cdot 2 \times 1,944}{5 \times 2,514}$

$= \frac{392,688}{125,870}$

$= (\text{say}) 3\frac{1}{2}$ in.

The load which we have given in the question is, of course, an extreme one for the beam described, and is merely assumed for the sake of illustration of the method of using the formula.

We will conclude the chapter with examples of the working of the two formulae given for the strength of timber posts. What is the safe load for a fir story-post, 8 in. by 8 in. and 12 ft. high?

Our first formula is $S = a \times \frac{d^4}{L^2}$ and here $a = 15\frac{1}{2}$, $d = 8$, and $L = 12$.

$\therefore S = \frac{31}{2} \times \frac{8^4}{12^2}$

$= \frac{31 \times 8 \times 8 \times 8 \times 8}{2 \times 12 \times 12}$

$= \frac{3,908}{9}$

$= 441$ cwts.

For the sake of comparison we will work the same example by the other formula.

$W = \frac{5,000}{1 + (\frac{19}{64} \times .004)}$

Here $l = 144$ and $b = 8$

$\therefore W = \frac{5,000}{1 + (\frac{144^2}{8^2} \times .004)}$

$= \frac{5,000}{1 + 1,296}$

$= \frac{5,000}{2,296}$

$= 2,206$

This is the breaking load in pounds per square inch of area of the post, and to compare with our previous result, where we found the safe load to be 441 cwts., we must put S and W into similar terms, thus:—

$S = \frac{W \times 64}{10 \times 112}$

$= \frac{5,000 \times 64}{2,296 \times 10 \times 112}$

$= \frac{20,000}{160 \cdot 72}$

$= 124$ cwts.

Our safe load here is taken at $\frac{1}{3}$ of breaking load; the first formula, therefore, allows only about three times the safe load to the breaking load.

British Architects, and that further photographs and a plaster relief map of the site are on view in the library of the Royal Institute.

W. J. LOCKE, Secretary.

9, Conduit-street, London, W.

CLARE COLLEGE.

Sir,—I noticed in last week's issue of the *Builder* your correction to the title of Clare College which was affixed to my drawings. Through the kindness of the Master of Clare College I am able to justify that title and to give some particulars with regard to its former title of Clare Hall.

Quoting from his letter of February 8:—"It is quite true that this college used to be known as Clare Hall, but on January 14, 1856, it was agreed that it should take the name of Clare College. There is no difference between a hall and a college at Cambridge, although there is at Oxford. In the original statutes given by our foundress in 1350 the foundation is generally spoken of as 'Domus de Clare,' but there are several papers in which it is referred to as 'collegium.' In the next set of statutes, sanctioned by Queen Elizabeth for us, the foundation is generally referred to as 'collegium.' There have been two sets of statutes sanctioned for this college during her present Majesty's reign, one in 1861 and the other in 1882. Each of these sets of statutes was formally designated by her Majesty in Council 'The Statutes of Clare College.' So that there can be no question that 'Clare College' is now our proper designation."

Perhaps you may find space to insert this.

T. TYRWHITT.
* * In Willis & Clark's great work, the 'Architectural History of Cambridge,' published in 1886, it is called throughout "Clare Hall" in the headings of chapters and pages, though we observe it is sometimes referred to in the text as "the College."—Ed.

FILTRATION OF SEWAGE.

Sir,—May I suggest a simple improvement in filtering clarified sewage for purification by the bacterial process. It consists in screening off a space, say, 2 ft. wide from one end of the filter bed, into which space the clarified sewage is delivered. The filtering material or filtrate is filled in against the other side of the screen, so that the whole face of the filtrate is exposed to the fluid in the 2 ft. space. The fluid will then pass uniformly through the filtrate to the discharge outlets at its further end.

I need not dilate on the importance of this to effective purification.

F. WENTWORTH-SHEILDS, M.Inst.C.E.

THE OLDHAM BUILDERS AND UNION FOREMAN.

Sir,—I see in last week's issue of *The Builder*, that Mr. W. Cunliffe, Vice-President of the Lancashire Federation of Builders, in his speech at the annual dinner of the Oldham and District Builders' Association, says that they have a trouble to face by foremen being in the Union and that by them being in the Union, they did not look after their employer's rights. As a Union foreman I beg to differ from Mr. Cunliffe.

In the first place, if an employer picks out a man that he sees is industrious and sober to make a foreman of him, is that man to throw over the Society of which he is a member, and to which he has paid a weekly contribution, say, for a few years, to lose all monies paid and also all benefits, for the sake of being a foreman, for the small amount that he is going to receive above the journeyman? If he did so, and fell sick, would Mr. Cunliffe pay him sick pay? If he died, would he pay his representative his funeral benefit? I do not think he would. Then probably after he had completed his job, there might not be another ready for him, when he would have to turn journeyman again.

If he had left the Union, he would most probably join again, with increased entrance fees and contributions to pay, and less benefits to receive. If it has to be done, having the name of being a foreman is not worth it: for the extra work and study which is attached to the job. I would like to draw Mr. Cunliffe's attention to the fact that I think he would do better to make sure that the foremen are in the Union before he employs them. Then he will know that he has a trustworthy servant, that he has been a trustworthy servant and has done his duty; what more is required? If, on the other hand, he sees that the foreman is neglecting his duty and not looking after his employer's interest, then he has the remedy in his own hands.

Perhaps Mr. Cunliffe has not had the best that is on the market, if there is any best. But I imagine when he brings this serious question before the body of his brother builders they will not all take the same view as he does.

G. CARPENTER.

BOOKS RECEIVED.

ELEMENTARY PHYSICS: By John G. Kerr. (Blackie & Son.)

THE PRINCIPAL CHANDOS; A MEMOIR: By J. R. Robinson. Sampson Low & Co.

GENERAL BUILDING NEWS.

CHURCH, OSSETT.—On the 29th ult. the cornerstone of a new church at Gawthorpe, Ossett, was laid. The church will comprise a nave 61 ft. 6 in. by 22 ft., with north and south aisles, each 61 ft. 6 in. by 10 ft. 4 in. The aisles are divided from the nave by arcades of four arches each. The arches are double chamfered, and rest upon octagonal pillars with moulded caps. The chancel measures 29 ft. 9 in. by 22 ft. 6 in., and on the north side of it is an organ chamber 15 ft. by 12 ft.; on the south side vestries for the clergy 15 ft. by 10 ft. and choir 15 ft. by 11 ft. 6 in.. The building is being carried out from designs by Mr. Swindon Barber, late of Halifax, and by Mr. Tom H. Farrar, architect, Halifax.

CHURCH ROOM, ELY, GLAMORGAN.—The Bishop of Llandaff opened a new church room at Ely a few days ago. St. David's Parish-room, which is in the centre of the village, has been erected from plans by Messrs James & Sweet-Escott, and is capable of accommodating from 200 to 300 people.

BAPTIST SUNDAY SCHOOL, ELLAND EDGE, YORKSHIRE.—This building, which has been erected on the site of the old school premises, was opened recently. The altered premises contain on the ground floor an assembly-room, 53 ft. 3 in. by 29 ft. 6 in. and 22 ft. in height. Entering from the assembly-room are seven class-rooms, each 10 ft. wide, and ranging from 16 ft. to 12 ft. in length. The assembly-room is entered by the old doorway and a porch and vestibule, 5 ft. wide. It also communicates with the basement by means of a stone staircase. Here is a class-room, 33 ft. by 24 ft. and 12 ft. high, having a wood-block floor on a concrete bed. In the basement is also the kitchen and heating chamber. The buildings are heated by hot water on the low pressure system, and ventilation is secured by Boyle's patent ventilator on the ridge. The woodwork is of pitch-pine, stained and varnished. The work has been carried out under the superintendence of Mr. E. Stocks, architect, Huddersfield, by the following contractors:—Messrs. Tidswell, Bottomley & Holmes, Brighouse; joiner, Mr. Job Crowther, Brighouse; plumber, Mr. J. Marsden, Huddersfield; slater, Mr. W. E. Jowett, Huddersfield; plastering, Mr. C. Hutchinson, Elland; painting, Mr. A. Marshall, Rastrick; and heating, Messrs. T. A. Heaps & Co., Huddersfield.

WESLEYAN CHAPEL, RAMSGATE.—The new Wesleyan Chapel at St. Lawrence, Ramsgate, has just been opened. The architect is Mr. John Willis, of Derby and London, and the builders are Messrs. Martin & Son, of Ramsgate.

BAPTIST CHURCH, MONK'S PARK, NORTHAMPTON.—It is proposed to erect a new Baptist chapel on the Monk's Park Estate, Northampton. The plans for the new chapel have been prepared by the architects, Messrs. Mosley & Anderson, Northampton. The building will be of red brick with stone facings.

ADDITIONS, CARLISLE GRAMMAR SCHOOL.—A new School of Science has been built by the governors of this school. The buildings consist of a chemical laboratory, physical laboratory, chemical and physical class-rooms, with preparation rooms, science room, &c., and have cost 1,500l. Mr. G. D. Oliver was the architect, and the work was carried out by the following contractors:—Messrs. J. & R. Bell, builders; Mr. E. Musgrave, joiner; Mr. Whitfield, slater; Messrs. Ormerod & Sons, plasterers; Messrs. Graham & Crawford, plumbers; Messrs. Ling & Mark, painters, all of Carlisle; and Mr. Richardson, Darlington, heating apparatus.

SCHOOLROOM, ST. JOHN'S, WORCESTER.—A new schoolroom has been added to the schools at St. John's, providing nearly 100 places in the infants' department. An old room was pulled down, and a building, 45 ft. by 20 ft. 6 in., has been erected. The architect was Mr. A. B. Pinckney. The building is of red brick with Bath stone facings. The builder was Mr. Stephen Steel, of St. John's.

SCHOOL, FRIMLEY, SURREY.—A new infants' school has been erected in connexion with the National Schools, midway between Frimley-street and Frimley Green. The building has been erected from the design of Mr. Graham Awdry, of Westminster. It will accommodate about 100 children.

SCHOOLS, CARDIFF.—The new Langetown-road Schools, Cardiff, have just been opened. The boys' and girls' departments are contained in the northern block of the buildings, and the infants' department in the one-story block nearest the railway. Accommodation is provided for 456 boys, 456 girls, and 572 infants. The boys' and girls' departments, on the ground floor and first floor respectively, are similar in plan, there being two schoolrooms for 70 and one for 60 scholars in each, together with five class-rooms, varying in accommodation from 40 up to 60, all opening on to a wide corridor. Lavatory and cloak-room accommodation is provided, together with store-rooms and private rooms for the head teachers. The infants' department has two school-rooms each for 110 scholars, three class-rooms for 60 and one for 72, and two babies' class-rooms for 50 each, with a similar corridor and cloak-room arrangement as in the other departments. Externally the buildings are in stone, having Newbridge stone and Maescywmmer stone shoddy facings, with Bath stone dressings to the windows and angles. There is a caretaker's cottage on the site, and a cookery school, together with the usual play-sheds, out-offices, and boundary walls. The works have been carried out by Mr. George Rutter, of Barry. The

Correspondence.

To the Editor of THE BUILDER.

THE CALIFORNIA UNIVERSITY COMPETITION.

Sir,—The Royal Institute of British Architects has been desired by the Marquis of Salisbury to give publicity to the International Competition for the Pebe Hearst Architectural Plan of the University of California.

In consequence of this request I should esteem it a favour if you would give me the opportunity of stating in your columns that programmes of the competition, together with maps of the site, can be obtained on application to the Secretary of the Royal Institute of

architects are Messrs. Veall and Sant, of Cardiff, and Mr. Charles Williams, also of Cardiff, has been clerk of works. The value of the works, including playground formation and boundary walls, have been carried out at a cost of about 14,800l.

CONSTITUTIONAL CLUB, CLEVEDON, SOMERSETSHIRE.—New premises for the Clevedon Constitutional Club have just been erected. The building comprises a reading-room, a card-room, a billiard-room with two billiard tables, a quiet ground, a skittle alley, stables, cyclists' accommodation, an assembly hall. It has been erected at a cost of 4,000l. by Messrs. Hill & Sons, builders, from the design of Mr. H. Taylor, C.E.

JUBILEE CLOCK TOWER, KINGSWOOD, NEAR BRISTOL.—A Jubilee Clock Tower is to be erected in the centre of Regent-street, Kingswood. The design is by Mr. J. Mackay, Kingswood. The height of the tower is 45 ft.

TEMPERANCE HOTEL, RUSSELL SQUARE, LONDON.—It is stated that a site has been secured in Russell-square, London, on which a temperance hotel, to cost 25,000l., will be erected. Plans have been prepared by Mr. Creese Harrison, London.

CLUB HOUSE, CLYDE, GLASGOW, REDFITCH.—A social club has been erected at Crabbs Cross by the Directors of the Enfield Cycle Company, Ltd., for their employees. At the end of the building is situated the concert hall, 40 ft. by 25 ft. Along the south side of the billiard-room and concert hall are the lavatories, &c., three bath-rooms, and two dressing-rooms. The cellar end of the building is the whole of the smoke-room, entrance-hall, and bar. The only upstairs rooms are over the same rooms, and are for the use of the caretaker and manager. Under the far end of the concert hall are the engine-room and store-room. The work was commenced in July of last year by Messrs. Geo. Huins & Son, of Redditch, under the superintendence of Mr. C. G. Huins, architect, of Redditch.

THE RECONSTRUCTION OF ABERDEEN MUNICIPAL BUILDINGS.—A meeting of the Finance Committee of the Aberdeen Town Council was held on the 31st ult. The committee took up the consideration of the report and plans which had been prepared by Mr. R. G. Wilson, architect, with reference to the reconstruction of the Municipal Buildings. Two schemes were submitted, one involving a cost of 6,500l. and the other of 8,000l. After the plans had been examined and the report gone into, it was remitted to a sub-committee to confer further with Mr. Wilson, and to get some further information as to how he proposed to carry out the scheme.

PUBLIC SLAUGHTER-HOUSE, ABERDEEN.—The Slaughter-house Committee of Aberdeen Town Council recommend as a site for the proposed Corporation slaughter-house a field at Killybreaster, 8½ acres in extent, acquired for the purpose about twenty-seven years ago, and of the capital value of 8,000l. The buildings which the Council has already agreed to erect, according to designs by Mr. W. Dyack, C.E., Borough Surveyor, are estimated, to cost 30,000l. additional.

TOWN HALL, HOYLAKE, CHESHIRE.—The new Town Hall at Hoylake was opened on the 2nd inst. The council offices are all situated on the ground floor, and are approached from Market-street by a central entrance, consisting of a porch, laid with encaustic tiling. The council chamber, which measures 38 ft. by 22 ft., stands at the right of the main entrance. By means of pilasters the walls are formed into a series of panels, the lower portion having an oak dado. The whole of the furniture and mantels are oak, designed by the architect. Adjoining the council chamber are the medical officer's room, and the general waiting room, and the clerk's, surveyor's, and accountant's departments are to be found on the left of the main entrance, provided with lavatory, strong room, &c. The public room, which is on the first floor, is approached by three entrances, two general entrances and one stage entrance. The main entrance is from Albert-road, and the staircase, the width of which is 7 ft., is provided with a ticket-office on the first landing. Accommodation for about 500 persons has been provided in the hall. The stage has been provided with a movable proscenium and other requisites for theatrical performances. Ladies' and gentlemen's dressing-rooms, lavatories, refreshment-rooms, promenades, and a caretaker's residence, are also provided in connexion with the hall. The remaining departments included in the scheme are the fire-station and the technical class-rooms, which were erected as a first section. As yet, the buildings are illuminated by means of gas; but provision has been made for the future introduction of electric light, and the wires have been laid throughout. Heat is supplied to the buildings by means of hot-water pipes, open fires, and a ventilating radiator. The general contract has been carried out by Mr. W. H. Forde, from the designs, and under the superintendence, of the architect, Mr. T. W. Cubbon, of Birkenhead, who was placed first in open competition. The total cost of the complete scheme has been about 6,500l.

A NEW THEATRE FOR DALSTON.—It is stated that a theatre is to be erected next to Dalston Junction-station. The architects are Messrs. Wylson & Long.

THEATRE, SWINDON.—A new theatre has just been opened at Swindon. The theatre—to be called the Queen's—has been built from the designs of Messrs. R. Milverton Drake and Fizey, archi-

tecs, of Bristol. The building will accommodate about 1,600. The number of exits provided is nine for the auditorium and three for the stage. The principal elevations are facing Clarence-street and Groundwell-road, the materials being red brick, with freestone, and Reading rubber facings. Bar accommodation has been provided on each floor. The dimensions of the stage are—depth 35 ft., width 55 ft., height to grid 47 ft., width of proscenium opening 20 ft., height 20 ft. The contractor is Mr. Charles Williams, of New Swindon. The lighting and fire appliances have been supplied and fitted by Mr. A. S. Scull, of Bristol. The building is about 110 ft. by 90 ft. wide.

BUSINESS PREMISES, IPSWICH.—New business premises have been erected at the upper end of Fore-street, Ipswich, for Messrs. Martin & Newby. The buildings have been erected by Messrs. Thomas Parkinson & Son, from the plans of Mr. T. W. Cotman, architect. The building consists of three stories.

HALL, IPSWICH SOCIAL SETTLEMENT.—Since the founding of the Social Settlement in Fore-street, Ipswich, about two years ago, various additions and alterations have been made to the premises. The hall, plans for which were drawn by Messrs. Eade & Johns, and carried out by Mr. E. Catchpole, is a building with a floor space capable of seating 650 persons, while there is in addition a platform recess and an organ chamber.

HOSPITAL, DUNOON, ARGYLLSHIRE.—The Victoria Hospital, which has been erected jointly by theburgh Commissioners and the Local Board, is now open, at a cost of about 8,000l., for the treatment of patients suffering from infectious diseases, was opened on the 2nd inst. The hospital consists of three pavilions, each containing two wards, while the administrative block is erected on a corner of the grounds. The architect was Mr. R. Bryden.

INSURANCE PREMISES, BRISTOL.—A new building for the firm of Messrs. Law Union and Crown Insurance Company. The building occupies a site at the junction of Clarence-street and Marsh-street. The structure, of ground Box stone, consists of three floors and basement. Of the three entrances the chief one is that at the angle. All three doorways are fitted with gates of wrought-iron from the firm of Messrs. S. & J. Mansford, the Mansford road and turret are covered with slates. The lighting will be by electricity, and the warming by hot water. The cost of the structure has been about 6,000l. The architect is Mr. Henry Williams, the builder is Mr. John Perrott, and Mr. W. Smith has done the carving.

VESTRY, WINDYBLOT, HERFORDSHIRE.—The old vestry on the north side of the chancel of this church having been transformed into an organ-chamber, a new vestry has been added in the north-west angle of the church. It was designed by Mr. Micklethwaite, London, and built by Mr. Glasscock, of Bishops Cleeve.

NEW WING, ST. AGATHA'S SCHOOLS, LANDPORT.—A new wing has been added to St. Agatha's Schools, Frederick-street, Landport. The new building, which is intended as a girls' school, to accommodate some 240 children, is a two-storied erection in red brick. Mr. J. H. Ball, of London, is the architect. Messrs. W. R. Light & Son are the builders.

TECHNICAL SCHOOL, COLNE.—On the 7th inst., at the Colne Town Council's monthly meeting, Mr. Councillor Holmes, Chairman of the Technical Instruction Committee, stated that it was practically settled that the Technical School should now be undertaken with the Corporation's consent from the General Committee of the Technical School, Willoughby, Manchester, at a cost of 10,000l. The site selected was in Albert-road. He moved that the minutes be confirmed. Alderman Varley seconded, and it was adopted unanimously.

PROPOSED BAPTIST CHAPEL, HALES OWEN, WORCESTER.—It is proposed to erect a new Baptist Chapel at Hales Owen. Plans for the new chapel have been submitted by Mr. A. Harrison, architect, of Birmingham. The building is to seat 350 persons, and the present school accommodation will be doubled.

FOREIGN.

FRANCE.—M. Barrias, the sculptor, is to execute a model for a large frieze in ceramic work for the new palace on the Champs Elysées, which will run round the whole building, and will constitute a kind of representation of the history of art by means of portraits of great artists. The work is to be executed at the Sevres manufactory.—The medal which is to be struck in commemoration of the pupil of the Ecole des Beaux-Arts who besides being "diplômé" by the Government, has obtained the largest number of prizes during the scholastic year, has this year been presented to M. Van Pelt, pupil of MM. Doullard and Deglane.—The Chamber of Deputies has unanimously adopted the decree for the suppression of the fortifications on the west and north of Paris, and it will shortly be submitted to the Senate. It is probable that the demolition of the fortifications will be commenced before the end of the year.—The "Ouest" Railway Company are about to make a new line called "Le Sud-Ouest" which will cross the lower Seine on a viaduct at Glos Montfort.—The exhibition of the Union Artistique de Toulouse will open on April 1,

and that of the Société des Beaux-Arts of Dordogne will open at Périgueux on May 10.

The Comte Delaborde is about to resign the duties of Perpetual Secretary of the Académie des Beaux-Arts, which he has exercised for twenty-five years. M. Delaborde, who is now 87 years of age, was a pupil of Paul Delaroc, and obtained a medal in the Salon of 1857. But at an early period he abandoned art for criticism, and was for a long time a contributor to the *Revue des Deux Mondes* and *Gazette des Beaux-Arts*. He is the author of a good many books on artistic subjects, notably a History of Engraving, a study on the works of Ingres, and a History of the Académie des Beaux-Arts.—The death is announced, at the age of 55, of M. Malaval, one of the most esteemed architects of the Lyons district. He was collaborator with Clair-Tisseur for the churches of Saint Blainville and of the Bon Pasteur, and was architect also of the churches of Chasse and Givors, and of numerous restorations of ancient historic houses, &c.—The death is also announced of M. Charles Lebey, who was much esteemed as a glass painter, and who has unhappily committed suicide at the age of 41. He was a pupil of Aimé Millet and of the Ecole des Beaux-Arts, and was a member of the Académie des Beaux-Arts.

PUBLIC WORKS IN NEW SOUTH WALES.—The roads, as main highways for traffic from Sydney, have, to a great extent, been superseded by the railways, but for a large portion of the colony they are still the sole means of communication, and as feeders to the railway system they play a very important part. In the interior of the colony the amount of work has been done in providing branch roads to the main arteries; roads between townships, and for access to the railway system; and routes for stock purposes. On many of these latter, in the dry parts of the far interior, a large sum has been expended in providing tanks and wells for supplying water to the stock. In the interior, the amount of work has been done in providing branch roads to the main arteries; roads between townships, and for access to the railway system; and routes for stock purposes. 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the Town Hall. Evidence was given by the Town Clerk (Mr. Whentley), and the Borough Engineer (Mr. W. Harpur), and others.

WINDOW, TWYCRoss CHURCH.—A stained glass window has been erected in St. James's Church, Twycross, the subject being the "Adoration of the Magi," with the following inscription:—"In honour of God Incarnate made manifest to the Kings and Princes of the Gentiles, this window is dedicated by parishioners and friends in the sixtieth year of Queen Victoria's reign, A.D. 1897." The work was executed by Mr. Herbert Bryans, of London.

BRADFORD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting and dinner of the members of the Bradford Society of Architects and Surveyors took place at the Great Northern (Victoria) Hotel on the 28th ult. Mr. James Ledingham presided, in the absence of the President (Mr. W. B. Woodhead). Mr. B. D. Fairbank was elected President for the ensuing year, and Mr. James Young, secretary and treasurer. After the loyal toasts the Vicar of Bradford proposed "Prosperity to the Bradford Society of Architects and Surveyors," and Mr. France responded. Other toasts followed.

PROPOSED CEDMON MEMORIAL.—A meeting was recently held at the Whitley Urban District Council Chambers of the Cedmon Memorial Committee, when Canon Rawnley presented the design for the Saxon cross which it is proposed to erect as a memorial of the great poet of Northumbria, in the churchyard of St. Mary's. This design has been prepared by Mr. Hodges, of Hexham. The design is based on the four fine specimens of Anglian crosses remaining of the time of Cedmon. These are the crosses of Bewcastle, Rothbury, Acca, and Ruthwell. The spirit of Saxon times is preserved in the design, which shows on one side in four panels Christ, David, Hilda, and Cedmon, and on the reverse a vine, within the spirals of which are figures of the six bishops trained in Whitley Abbey, and St. Cuthbert and St. Bede. The two sides are decorated with symbolical designs. The committee unanimously accepted the design, together with the estimate of the sculptor, Messrs. Beall, of Newcastle.—*Whitley Gazette.*

MASTER BUILDERS' ASSOCIATION, GRIMSBY.—The third annual dinner of the members of the Grimsby Master Builders' Association was held at the Ship Hotel on the 2nd inst. The President, Mr. A. S. Siller James, and the Vice-President, Mr. Hewins, were unable to be present, and Mr. J. H. Thompson occupied the chair. The loyal and patriotic toasts having been honoured, the Mayor, Councillor J. Rutcliffe, proposed the toast of the evening, "The Grimsby Master Builders' Association." He said their Association was formed for the advancement of their good and proper interests, and that their motto was defence rather than defiance. They found that the advantages which the workers under him had obtained by combination could also be applied in their interests. He was a believer in unions and combinations. He believed they did great deal to promote the interests of those who were associated together, and they were not necessarily antagonistic to the well-being of the community at large, in fact, under a wise administration and sensible and proper treatment they did a great deal of good all round, not only to those immediately interested, but in the general welfare. He coupled with the toast the name of the Secretary, Mr. Tonge. Mr. Tonge, in response, said that their Association was formed in July, 1895, and their objects were fourfold. In the first place they desired to promote a better feeling between all the heads of the different trades and kindred trades in Grimsby; their second object was to obtain information relative to the building trade from all parts of the country, and to circulate it amongst the members of the trade in Grimsby; the third object of the Association was to obtain more equitable contracts between the builders and their employers, because it was notorious that the building contract was one of the hardest and most severe in existence; fourthly, and by no means lastly, their object was to deal with all disputes between masters and their operatives, and if possible to obviate strikes and lock-outs. With regard to the past year, it had been a most calm and quiet one. It had not been marred by any disputes whatever between the masters and their men, between the masters themselves, or between the masters and the Corporation, for there had been no prosecutions whatever for any breach of the by-laws. The past year had also been fairly flourishing. During the twelve months plans had been passed for 790 houses, 23 shops, 3 schools, and for 92 alterations and additions, making a grand total of 388. With regard to the future, he would suggest that they should form a library of books dealing with matters of interest to the building trade, and they should also make a collection of catalogues and price-lists of goods and appliances used in the building trade. These books and price-lists and catalogues should be deposited in a central place easily accessible to the members of the Association. He would also invite the Association to watch, and also to follow the lead of the Sheffield Association, which had given notice that the members of that association would not sign any contract which contained a clause imposing penalties if the work was not finished at a given time. They had also given notice that they would not supply prices and specifications until they had received notification

that their tender was a successful one.—The Chairman proposed the health of the Mayor and Corporation, and the Mayor responded. Mr. Rushforth submitted the toast of the engineers, architects, and surveyors. As to the architects, he believed they had infused a higher tone into their work of late. He coupled with the toast the names of Mr. Cresswell, Mr. Bentley, and Mr. Rushton, all of whom responded. Other toasts followed.

MASTER BUILDERS' ASSOCIATION, NOTTINGHAM.—The annual dinner of the Nottingham Master Builders' Association took place on the 3rd inst., at the Albert Hotel, Derby-road. Mr. J. Wright (President of the Association) occupied the chair, and Mr. W. Edgar (vice-president) the vice-chair. The toast of "The Queen and the Royal Family" having been honoured, Mr. J. Woodson submitted "The Mayor and Corporation of Nottingham." They, as an association of builders, appreciated all the good work that the Corporation did.—Councillor A. Pyatt, whose name was associated with the toast, responded. As to the question of a new town hall, he said, the spending of a quarter of a million required a good deal of consideration. They were all somewhat ashamed of the present building that stood in the Market-place, but a new one would come in good time.—The Chairman next proposed "Success to the Master Builders' Association." He congratulated the members upon the activity of the past year. Another source of congratulation was the fact that they had had very little trouble with the workmen during the past year. During the twelve months there had been no less than 108 meetings of the Association, at which minutes had been taken, in addition to many informal and conversational meetings on small matters. A cause for congratulation was that their membership had increased by ten during the past year, and they now numbered seventy-nine. The reference committee had had a series of questions affecting architects, or, rather, their own relation to architects. He was very happy to be able to state that they, as an association, were on satisfactory terms with the architects' association, and they had recently had a meeting with members of the architects' association, at which they put before them various points which they wanted them to consider in framing and drawing up future contracts, and the architects received them in a very cordial and business-like manner, and he had every reason to believe that in a short time they would have arranged a common form of contract which would be used in every architect's office in the city and by every builder in the town. This would save a lot of friction when contracts were signed. The President announced that a Midland Association had been formed for the Midlands. Referring to trades-unionism, the President said that if the demands of trades-unionism became too strong, it was very necessary they, as master builders, should be federated to resist them. Everybody recognised that during the past years trades-unionism had become much too aggressive, that it had made demands that they were bound to resist; and they could not have a better illustration of that than the great struggle which had just terminated in favour of the employers in the engineering trade. The trades-unionists proposed an universal federation of all the unions to fight their battles, but it seemed to him that they were a little short-sighted, because they would force the employers into a similar federation, and they would find that the relative position of both would be the same, and the capitalists would be as strong in proportion towards labour as they were before there were trades-unions. The limitation of apprenticeship was not only detrimental to the trade, but also to the community, for if everybody kept apprentices it would not only tend to break down the restrictions now put upon them, but by it they would be able to supply men in cases of emergency.—Mr. Henry Vickers and Mr. Frank Hodson responded to the toast. Mr. Vickers said that they, like the engineers, wanted to manage their own business; they did not want it to be done by the extreme leaders of trades-unionism. It was well known that instructions had been given to the men to get as much money as they could, and do as little as they could. That was a very unjust thing to the Vice-President proposed "The Visitors," to which Mr. Starkey (Leicester) and Mr. Belcher replied, and Mr. F. Fish gave "The Chairman." The present Secretary of the Association is Mr. W. J. Barton.

MESSRS. YOUNG & MARTEN'S DINNER.—The fourth annual dinner of the heads of staff of the firm of Messrs Young & Marten, Caledonian Works, Stratford, took place at the Holborn Restaurant on the 2nd inst., when Mr. H. H. Marten, proprietor, in the chair, and Mr. E. Montague Edwards, general manager, in the vice-chair. Mr. E. M. Edwards, vice-chairman, stated, in proposing the health of "The proprietor of the business, and success to the firm of Young & Marten," that the new stores, for which the contract had just been accepted, would cover a stocking area of four times the firm's present capacity, and would enable it to hold a largely increased stock, a very essential item in ensuring one of the points always sought for by the firm, which was promptitude. The chairman, in the course of his reply, said that it was expedient and desirable that they should meet thus once a year, not only to enjoy a social evening, but also to interchange ideas with regard to the progress of the business. Last year he had expressed the hope that 1897 would be a re-

cord year, and he was glad to say the volume of trade done justified that hope, as they had a considerable increase in their turnover. He also referred to the publication of their new catalogue, as likely to be of material assistance to the business in the course of the present year.

CHOIR STALLS, ST. PETER'S CHURCH, ABBEYDALE, SHEFFIELD.—New choir stalls have been erected in this church by Messrs. Jones & Willis, Birmingham, the work being superintended by Mr. Joseph Norton, architect, Sheffield. They comprise two prayer desks for the clergy, and seating for twenty boys on the front rows and twenty men on the back rows, these being raised one step.

STREET IMPROVEMENTS, HOVE.—On the 2nd inst. Mr. H. P. Boulton, M.Inst.C.E., held an inquiry at the Hove Town Hall into the application of the Hove Urban District Council to the Local Government Board, for sanction to borrow 6,500l. for works of street improvement. Mr. C. A. Woolley (Solicitor to the Council) supported the application on their behalf, and the Town Clerk (Mr. H. Endacott), the Town Surveyor (Mr. H. H. Scott), and several members of the Council were also in attendance.

PULPIT, CHURCH OF ST. MARY, BICKINGTON, DEVONSHIRE.—A new oak pulpit has been placed in the Church of St. Mary, Bickington. It has been erected by Messrs. Harry Hems & Sons, of Exeter.

DEMAND FOR SURETIES FROM CONTRACTORS.—The Islington Board of Guardians received a letter from Messrs. Dove Bros., complaining that they were unable to tender for the erection of the new infirmary, owing to an objectionable item in the condition of contract, rendering it necessary to obtain two sureties of 500l. each. The chairman thought that, as the contract amounted to 150,000l., it might not, as suggested by Messrs. Dove, be etiquette to ask for the sureties, and he would suggest that they should not be insisted upon, "unless required." Mr. Doherty hoped they would stick to the sureties, as a safeguard of the ratepayers' interests. Mr. W. H. Walkley said he would not vary the terms of the contract, or they would be told they had done so to serve the purposes of Messrs. Dove. The majority of the Guardians agreed with the views of the last speaker, though it was admitted that the reputation of Messrs. Dove stood high.

SURVEYORSHIP, ST. MARTIN-IN-THE-FIELDS.—A vacancy has occurred in the Surveyorship to the Vestry of St. Martin-in-the-Fields, owing to the present Surveyor, Mr. Chas. Mason, who has held the appointment for eight years, having accepted a partnership in the business of Messrs. Foster & Pearson, horticultural builders and heating engineers, of Beeston, Notts. Mr. Mason's resignation was accepted at the meeting of the Vestry on the 3rd inst. The question of appointing a successor has been referred to the Works Committee for consideration.

THE SANITARY INSTITUTE.—At an examination for inspectors of nuisances, held at Glasgow on February 4 and 5, the following seven candidates were certified as competent to discharge the duties of inspectors of nuisances:—R. P. Fleming, Dundee; J. Gilfeather, Dumfries; J. Irving, Motherwell; A. S. Macqueen, Linlithgow; J. McClement, Renfrew; A. Smith, Peterhead; Miss A. N. White, Edinburgh.

VENTILATION AND WARMING.—Messrs. Shorland & Brother (Manchester) ask us to mention that the Isolation Hospital for Chester, described in our last issue, is warmed and ventilated by means of their patent Manchester stoves with descending smoke flues, and their patent exhaust ventilators. The same firm have carried out the warming and ventilation on the same method, for the intermediate schools, Llandrindod Wells, also mentioned in our last issue.

MASTER BUILDERS' ASSOCIATION, BRISTOL.—The annual meeting of the Bristol Master Builders' Association was held a few days ago at the Guildhall, under the presidency of Mr. August Krauss. The Secretary, Mr. H. J. Spear, having read the annual report, Mr. G. Humphreys (treasurer) presented the audited accounts. The President moved the adoption of the report and accounts, and said they were pleased to know the building trade was good in Bristol last year, and what was still better, they had no disputes with their men, for which both sides should be thankful. They had formed, that year, their West of England and South Wales Federation, which consisted of builders in Bath, Bridgwater, Cardiff, Newport, Taunton, Plymouth, and Weston-super-Mare. The Federation had been formed for the purpose of doing justice to their men and themselves. Should any differences arise they hoped they would be overcome without any strike, as strikes only meant a heavy loss and sufferings on both sides. The Federation had taken steps as regards the Employers' Liability Act, and had approached the architects to have a clause inserted in quantities similar to a fire insurance clause, so as to relieve the builders of heavy responsibility, and other Federations had also taken that step, which would certainly be favourably considered by the architects. Mr. Downs seconded the resolution, and dwelt upon the importance of enrolling new members, and especially young men engaged in the building trade in Bristol. He was pleased to observe from the treasurer's account that the membership had been augmented considerably during the past year. The

resolution having been adopted, the President said it was with regret that he announced that their Vice-President, Mr. William Church, was unable to accept the office of President, in consequence of indisposition. Mr. G. Wilkins moved, "That the members assembled at the annual meeting of the Association desire to place on record their appreciation of the long and valued services of Mr. William Church, which had contributed to the success of the Association, and they deeply deplore the cause of his inability to undertake the duties of the presidential office, to which he was entitled during the ensuing year. They also express their fervent desire for his speedy restoration to health." Mr. C. A. Hayes seconded the resolution, which was carried by acclamation. Mr. Walters proposed, Mr. J. E. Jones seconded, and it was carried by acclamation, that Mr. August Krauss be re-elected President for the ensuing year. It was also agreed that the best thanks of the Association be tendered to Mr. Krauss for his attention to the work of the Association during the past year, and for the manner in which he had conducted the business. Mr. Krauss acknowledged the compliment paid to him, and promised to use his best endeavours in the interests of the Association. Mr. F. N. Cowlin was requested to accept the office of Vice-President of the Association, and he was cordially elected. Mr. A. S. Scull moved, and Mr. Podger seconded, that Mr. George Humphreys be re-elected Treasurer for the current year, and a vote of thanks was accorded to him for the time and labour which he had devoted to the finances of the Association, and more especially in connexion with the visit of the Master Builders' Association of Great Britain. The Executive Committee for the year was elected on the motion of Mr. C. Cowlin, seconded by Mr. Woodward, and, after a ballot had been taken, Messrs. Hayes, Downs, Wilkins, Scull, and Eastbrook were added to the committee.

CAPITAL AND LABOUR.

CARPENTERS' WAGES, BELFAST.—The builders of Belfast have received a notice from the Amalgamated Society of Carpenters and Joiners requesting an increase of wages for their members of $\frac{1}{4}$ d. per hour. They also desire work to be stopped at twelve o'clock on Saturdays, and a few other minor details as to outside work and overtime modified. This they desire to come into operation on May 1 next.

BRICKLAYERS' STRIKE, CROMER.—About seventy bricklayers at Cromer came out on strike in consequence of local builders refusing their demand for an extra 1d. per hour. Three months ago they gave notice that this course would be taken at the end of January if the increase was not granted. As the result of negotiations the matter was settled, and work has been resumed, the masters having agreed to an extra $\frac{1}{4}$ d. per hour, the men signing an agreement to be content with that sum for the next three years.

CARDIFF MASONS AND DRESSED STONE.—Some months ago a difficulty arose at Cardiff in connexion with the old question of dressed stone. Mr. W. Symonds had a contract for the erection of a new boundary wall of the workhouse, and purchased the dressed stone from Messrs. Turner & Sons, who have special facilities for turning out that class of work. Notwithstanding the fact that Messrs. Turner & Sons pay union wages, it was argued by Councillor Crossman, on behalf of the Masons' Society, that Mr. Symonds, who took the contract from the Corporation, was not carrying out the conditions of labour to take any action, but the dispute has been festering ever since, and about thirty-two men employed by Messrs. Turner, and forty men employed by Messrs. W. Thomas & Co., have left work.—*Western Mail*.

FEDERATION IN THE YORKSHIRE BUILDING TRADES.—For some time past the master builders of Yorkshire have had under their consideration the formation of a federation of employers engaged in all branches of the building trade, on similar lines to that which exists in Lancashire. The suggestion at first did not meet with complete approval, but there now can be no doubt of the permanent establishment of a strong combination of the masters. The increased demands of the men, and the success of the Employers' Federation in the recent engineering dispute, have made the master builders almost unanimous in determination to combine for mutual protection and interest, and it is said that time alone is required to complete the arrangements. While these arrangements are being carried out with a view to securing unity of action in future, the masters in Leeds are confronted by a batch of important demands from their employees for increased wages and improved conditions of labour. The operative plumbers have formulated the most important demands. They have tendered a six months' notice, which expires on June 1, for an increase in the rate of pay from 8d. to 9d. per hour, and for the alteration of the rules relating to the number of apprentices, work on out-jobs, and the hours of work in winter. At present there is no restriction placed on the number of apprentices, but the men's union now desire to put some limitation on the number, similar to that in force in many other trades. In regard to hours, the men wish to have a

nine-hours day in winter, instead of being stopped, as at present, at half-past four and five o'clock. The plasterers have asked for an additional penny per hour, and for several minor concessions. It is understood that the Master Builders' Association offered the men an increase of a halfpenny, but as this was declined, the employers have now withdrawn the offer. The joiners have given the customary notice, which will terminate on May 1, asking for an increase from 8d. to 9d. per hour. As yet, however, the demand has not been considered by the employers. The masons are also seeking a similar increase, and practically the only workmen in the building trade who have not asked for an advance are the bricklayers. Several meetings of the employers are to be held shortly to consider the requests, but it is highly improbable that all the demands will be conceded. It is stated that a dispute exists on the part of the masters to give the labourers an advance, though it is not definitely known that the feeling is anything like unanimous.—*Leeds Mercury*.

BUILDING TRADE DISPUTE, CHELTENHAM.—When in May, 1896, the dispute between the masons, carpenters and joiners, plasterers and plasterers, and the master builders of Cheltenham came to an end and a code of working rules was adopted by which their future conduct should be governed, one of the rules had reference to the question of working hours. Under that rule it was agreed that the employees should work from March 1 to October 31 inclusive from 6 a.m. to 5.30 p.m., and the first five working days of the month, with 1½ hours allowed for meals, and on Saturdays from 6 a.m. to 1 p.m. with half an hour allowed; during the months of November and February from 7 a.m. to 5 p.m. with 1½ hours allowed; and during December and January from 7.30 to 4.30 with one hour allowed. A similar rule was inserted in the code adopted for the guidance of the other branches of the building trade, notably the bricklayers and the labourers, in the settlement of their dispute last May. The working of this rule during the present winter months has not been an unmitigated blessing either to employers or employed, for the reason that owing to oversight on the part of the employers, who drafted the rule they did not insert therein the hours at which the men should have their meals. The consequence is that the men and their employers, placing different constructions upon the meaning or intention of the rule, are now at loggerheads, and some of the men have struck work. The dispute which has led to this stoppage of work entirely centred upon the breakfast half-hour.—*Cheltenham Chronicle*.

LEGAL.

THE LONDON BUILDING ACT, 1894:

WATSON v. PAYNTER.

THIS case—a report of which appeared in the *Builder* of January 15, page 57—was further discussed before Mr. Hannay at Marlborough-street Police-court on January 14.

At a further hearing on January 20, plans were put in of the previously existing domestic buildings occupying this site, which plans had been certified by the District Surveyor under Section 43 (1), and also the plans of the intended new building; evidence was given that while no more land at the rear in the basement would be occupied by the intended new building than was occupied by the previously existing domestic buildings, certain deviations would be made in the upper part of the new buildings from the plans as certified; and further plans were put in, showing such deviations on each of the several floors, and a sectional drawing showing deviations in the height of the building in its several parts.

On the 3rd inst. Mr. Hannay gave his decision as follows, viz.:

"I have come to the conclusion, which I certainly do very much against my will, that the objection of the District Surveyor must prevail, and that I must affirm it. I don't know whether you require me to go minutely into the various points. But I may state generally that I consider a deviation may be in any respect, for if a deviation from the plan or plans as certified by the District Surveyor is any deviation at all, then it brings them within the sub-Section (ii.) of the 43rd Section of the Act. I do not see how it is possible for me, as a matter of fact, to say that these plans do not deviate. I consider it been called upon to make an order, I am of opinion that I must affirm that the District Surveyor is right, and that the new buildings cannot be raised to a greater height than previously without the consent of the County Council. I do not feel confidence in my opinion. I shall feel satisfied if it is upset by the Court above.

Ten guineas costs allowed.

TANNER v. DREW AND CADMAN.

THIS case, which related to the application of Sub-section 2, Section 74, of the London Building Act, 1894, to the internal rearrangement and alteration of a building, was heard before Mr. Dickinson, at the Thames Police-court, on January 28 last, and his decision thereon was delivered on the 4th inst.

The case was brought by Mr. A. W. Tanner, District Surveyor of St. George-in-the-East, against Messrs. Drew & Cadman, contractors. The defendants were engaged to carry out certain alterations to a public-house known as the King's Head Distillery, in Commercial-road, which alterations were considered by the building owners to be of a simple character, inasmuch as very little work was to be done to the external walls, and no change whatever was to be made in the cubical contents of the building. The public bars, however, were to be increased by taking in part of the premises before comprised in the dwelling house part.

The King's Head, an old building, stands at the corner of two streets. The area of the house exceeds ten squares. At the end of the building next the side street was the kitchen, on the ground floor, and adjoining the kitchen was the private bar. The kitchen was to be removed entirely and the bar space increased by taking in part of the area formerly kitchen; the remaining area formerly kitchen was to be formed into a new passage to the new doorway from the side street, giving access to the existing staircase leading to the dwelling-house portion above. An entirely new partition was to be built dividing this passage from the enlarged public bar, with a communication door in same. The District Surveyor contended that this partition should be constructed throughout of fire-resisting materials—i.e., should be of brickwork with a fire-clay floor instead of a wood partition, as the builders proposed. To this requisition the defendants objected.

Mr. Seager Berry, of the London County Council, appeared for the District Surveyor, and Mr. Percy Gates for the defendants.

Mr. Percy Gates contended that no material alteration was contemplated to any external wall, that the character of the building was not to be altered in the slightest way, and that a mere matter of internal arrangement involving no structural work was not sufficient to bring the building under the regulations of Section 74, sub-Section 2. He adduced the case of *Marsland v. Tyerman* (reported in the *Builder* of April 17, 1897), as supporting his view, and also the case of *Scott v. Legg*, 10 Q.B.D. 235; he further urged that the work was necessary repair within Badger v. Denn, 22 J.P. 129; and also that Section 209 of the London Building Act, 1894, only applied to alterations, &c., made to buildings erected since January 1, 1895.

Mr. Seager Berry urged that *Scott v. Legg* had no application to the present case, by reason that it was merely a decision under the 1855 Act as to what constituted "an addition" or "unfitting," and that that case had also been covered by new words in Sections 75 and 207 of the 1894 Act. He pointed out that the partition was entirely new work, and formed a separation of the trade portion from the dwelling-house portion of the house, and also was an enclosure of a new approach to the dwelling-house portion, and so doubly within Section 74 (2), by reason of Section 209; that the work was not necessary repair, as it was not repair at all, but an arrangement, and that it was clearly new work, and the words "a new building" in Section 209, made alterations in old buildings to the extent of such alterations subject to the 1894 Act, and he quoted *Crow v. Redhouse*, 59 J.P. 555 and 663, in support of the last contention.

The Magistrate expressed some surprise that a matter so important as this had not already been authoritatively settled by the High Court, but it appeared that no case had been appealed during the three years the Act has been in operation.

Mr. Dickinson delivered a considered judgment in which, after stating the facts, the Magistrate said: "The whole point is whether the partition in question should be of wood, as proposed by the defendants, or of brick, as proposed by the plaintiff. Mr. Berry relies on Section 74 of the 1894 Act, sub-Section 2 [Magistrate read Section 74 of the Act]; that is a new provision and came into operation, so it is said by Sections 207 and 209. Before commenting on these sections I will read Section 210, which is as follows [Magistrate read Section 210]. Therefore by Section 210, unless altered the house could not be objected to. Then come Sections 207 [Magistrate read it]. Then Section 209 in which the material words are: 'Any work done for any purpose in any building (except that necessary repair not affecting the construction of any external or party wall) shall, so far as regards such work be subject to the provisions of this Act. That is, if you are making alterations, the new work shall be in accordance with the Act, so far as relates to new work.'

This is a building erected before January 1, 1895, and as it stood, by Section 210 is deemed in conformity with the 1894 Act, but alterations have been made, and by Section 207 such alterations are subject to the 1894 Act, viz., in this case, Section 74 (2). That being so, one question Mr. Gates raised was 'necessary repair.' Now repair must be something original. This partition is new and did not exist before. To repair does not mean to erect for the first time. I have no doubt this is not necessary repair. Mr. Gates also relied on *Scott v. Legg*, but I fail to see how that case applies. The question there was whether an addition of a new portion to an old building was within Section 28 of the 1855 Act; in any case, it does not get over the words 'any work done in a building' in Section 209.

1894 Act. So far as it goes, the case really presents the District Surveyor's contention, for in case Lord James, in his judgment, says: "In order not to harass the proprietor of any old buildings or manufactories, the Act went on to say that it should be lawful for them to make any addition, alteration, or other works to their old building, but with this proviso and this proviso only, that to the extent of such alteration, addition, or work, the same should be subject to the regulations of this Act." i.e., anything new is subject to the Act. Lord Baggallay also says, "Any addition to any old building shall to the extent of such addition be subject to the regulations of this Act." In Scott v. Legg they were merely dealing with an addition. Lord Bramwell also observes that "it was intended to leave owners of old buildings unfettered by the Buildings Act except by the powers specially provided." An old building is not touched, but any addition is; any addition must be in conformity with the provisions of the new law; any alteration must be in such conformity; any work done in the building must be in such conformity. I agree with Mr. Gates that Badger v. Penn goes to show that a building owner is not to be worried by requirements where no public good is gained, but where a public good is aimed at, such as protection from fire, it is quite clear that it is the duty of the District Surveyor to see that the Act is carried out. This partition, therefore, which separates the trade portion from the dwelling-house portion of this building must in my view be of fire-resisting material.

An order was made to comply with the District Surveyor's notice of irregularity, and 21. 2s. costs.

MEETINGS.

FRIDAY, FEBRUARY 11.
Royal Institution.—Dr. J. H. Gladstone on "The Metals used by the Great Nations of Antiquity," 9 p.m.
Institution of Mechanical Engineers.—Annual general meeting (concluded), 7.30 p.m.

SATURDAY, FEBRUARY 12.
Edinburgh Architectural Association.—Visit (1) to the Prudential Assurance Buildings, St. Andrew-street; (2) Edinburgh Stock Exchange, St. Andrew-square; (3) Jenner's Buildings, Princes-street.

MONDAY, FEBRUARY 14.
Royal Academy of Arts (Lectures on Architecture).—Professor Atchison, R.A., on "The Italian Renaissance," 8 p.m.
Society of Arts (Lectures).—Mr. Hugh Stannus on "The Principles of Design in Form," 1 p.m.
Society of Arts (Lectures).—Fifteenth annual dinner, King's Hall, Holborn Restaurant, 6.30 p.m.
London Institution.—Professor J. Milne on "Geological Changes Beneath the Ocean," 5 p.m.
British Society of Architects.—Mr. M. Aston Green on "Some Ancient Roman Buildings," 8 p.m.

TUESDAY, FEBRUARY 15.
Institution of Civil Engineers.—Mr. P. M. Crosswhite on "The Stability of Channels through Sandy Estuaries," 7 p.m.

WEDNESDAY, FEBRUARY 16.
British Archaeological Association.—Rev. W. S. Lachy on "Australian Lights on the Later Stone Age in Britain," 8 p.m.
Builders' Foremen and Clerks of Works Institution.—Ordinary meeting of members, 8 p.m.
Society of Arts (Lectures).—Mr. J. Kelin, M.A., on "The Protection of Industrial Property," 8 p.m.
St. Paul's Ecological Society.—Mr. Joseph Grimshaw on "Some Cathedral and Town, especially the Pious of Toledo and Burgos," illustrated by lime-light drawings, 7.30 p.m.
Edinburgh Architectural Society.—Mr. J. E. Forbes on "Norman Architecture," 8 p.m.
Edinburgh Architectural Association.—Mr. Ralph Kedley on "Architectural Modelling," 7.30 p.m.

THURSDAY, FEBRUARY 17.
Royal Academy of Arts (Lectures on Architecture).—Professor Atchison, R.A., on "The Italian Renaissance," 8 p.m.
Society of Antiquaries.—8.30 p.m.
Royal Institution.—Dr. Jean Paul Richter on "Some Lectures at the National Gallery," 11. 3 p.m.
Institution of Civil Engineers.—Students' Visit to the London and North-Western Railway Goods Warehouse, Broad-street Station. Assemble at the entrance to the Works in Finsbury-avenue, 2 p.m.

FRIDAY, FEBRUARY 18.
Incorporated Association of Municipal and County Engineers.—Metropolitan District meeting, to be held at the Offices of the Institution of Civil Engineers, Westminster, 7.30 p.m.

SATURDAY, FEBRUARY 19.
Architectural Association of Ireland.—Special Visit to the Science and Art Museum, Kildare-street, 2.30 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until March 10.

[1896] 28,025.—AN INSTRUMENT FOR TAKING AND RECORDING LEVELS IN A CONTINUOUS SECTION: Colonel Fraser, R.E. (retired).—Two parallel perambulator wheels connected at their centres by a bar, move a style attached to the middle of a straight rod in a fixed direction and at a constant rate, while the wheels travel in a curve. A separate upward movement along the direction of an arm inclined to the rod, by means of an integrating mechanism, the style repeats upon a sheet of paper behind the curve any reduced scale desired, from the pole of the instrument, which is kept vertical by an inertia pendulum; along level ground the inclined movement of the bar carrying the

tracing style and its horizontal motion are so proportioned that the style draws a vertical line; on rising or falling ground a curve is drawn, the pendulum alters the position of the wheel in frictional contact with and driven by a cone which in turn receives its motion from the perambulator wheel—thus the bar's inclined movement is accelerated or retarded, and the pencil deviates from the vertical line indicating the incline or decline of the ground.

This instrument is based upon the principle of the differential calculus, that where ψ = angle between the radius vector of a circle at the point whose polar co-ordinates are r and ψ , and the tangent to the curve at that point, then $\cos \psi = \frac{dr}{ds}$; that is, when the arc S is increasing at the rate $\frac{ds}{dt}$, the rate of increase of the radius vector is $\frac{dr}{dt} = \cos \psi \frac{ds}{dt}$. The wheel's path on the ground is treated as a curve whose length the wheel measures, and when the style receives a transverse motion in proportion to the distance run and a directed motion in the line of the radius vector proportional to the inclination of the radius vector to the tangent of the curve of the ground at each instant of time, the natural section of the ground appears, to a reduced scale, on the paper. When the paper's lower edge is reached, style and paper are carried up and reset to make the section continuous.

[1897] 654.—PURIFYING WATER, SEWAGE, AND OTHER TOXIC LIQUIDS BY BACTERIAL ACTION: Colonel Ducloux, R.E.—To ensure continuous aeration by natural means of a continuously acting filter bed, the inventor constructs the sides of the structure containing the filtering medium of open work in the form of gratings, honey-combed brickwork, tiles, perforated metal, or the like, giving access for ambient air to the filtering medium; the apertured sides have an upward inclination from within.

[1897] 655.—HANGING AND OTHER LOCKS: Bates & Dowd.—For locking with or without a key a hook and bolt are contrived—the hook being at back of the lock, the bolt extending beyond the lock's rim; the extension is used for locking purposes when pressed in; for sunk hasps a projecting stump on the bolt goes through a slot in the back of the lock which comes up to the hook.

[1899]—SHEET-IRON CORRUGATED ROOFINGS: C. Brinckman.—These are bent at their joining points into a form which keeps out rain and snow, and to allow expansion by warmth; the sheets are transversely bent in opposite directions at their two ends, and fixed by clasps engaging beneath the roof-beams.

[1899]—DOOR, WINDOW, AND OTHER FASTENER: R. Grimmer.—The bolt carrier has a screw-threaded periphery working in an internally screw-threaded casing or ring, so that the bolt when turned engages with the door or window.

[1899]—PRESERVATIVE PAINTS, PIGMENTS, VARNISH, &c.: F. Fritzsche & Co.—An amount, from 2 to 5 per cent., of metantryparacetol is added to the oxides of metal (copper, lead, zinc, mercury, &c.) during the grinding, or it may be combined first with the metals, and the metallic compounds may be added to the paint, varnish, or lacquer.

[1899]—LAVATORIES, BATHS, SINKS, &c.: J. Shanks.—A discharge valve is arranged to close down on a seal below a metal or earthenware grating in the vessel's outlet, the valve being attached to an actuator on a side wall, tending (a) up through the overflow passage, or (b) downwards through a trap in the discharge pipe; the invention includes a discharge outlet in a depressed part or well of the vessel, and the extension of the pipe upwards into such well, where it is covered by a siphon-like pipe between which and the well-sides is a small annular space into which the bell-shaped valve dips.

[1899]—BRAZING OR SOLDERING HEATHERS: Judge & Hunt.—With the hearth is combined a removable cover or roof which may be lifted at will, thus free access to the fire is obtained; the cover can be supported by chains passing over pulleys; the contrivance is especially adapted for tube-soldering.

[1899]—ARTIFICIAL STONE: G. Christie.—The invention lies in mixing the ingredients with just enough liquid to allow them to be molded, and at once turning the moulded mass out and spraying it with water, steam, or the like, in a light fine cloud by a fine spray diffuser; the block absorbs the water more easily, and without injury to its shape.

[1899]—SLABS FOR COVERING WALLS: T. Krah.—These are made of glass, with hooks at the back for their attachment by mortar, cement, or other manner.

[1899]—WALL PAPERING: G. H. Metcalf.—Perforated metal strips are used, firmly secured to the furring strip bent to an angle; metal guide strips are secured by an angle plate nailed to the wall, a T-shaped piece stamped from the angle plate and bent at 90 deg. to form a button for interlocking with an aperture in the strip; for caps, corbels, &c., and for new walls to existing walls, perforated strips are bent in length to a right angle.

[1899]—FIREPROOF CLOTH: Bancroft.—For use in gunpowder or explosive works, in gasworks and the like, the cloth is glazed or finished on its outer surface, it has a woollen welf and a worsted warp, and is dipped in a mixture of tungstate of soda (50 per cent.), phosphate of soda (10 per cent.), and water (40 per cent.).

[1899]—ROOFING: R. Glendinning.—This consists of layers or sheets composed of tar, pitch, resin and Trinidad asphaltum.

[1899]—ELECTRIC HEATING DEVICES: F. Le Roy.—The inventor uses a rod of high specific resistance, its heat being utilised by direct radiation; the rod is entirely unexposed to the chemical action of the surrounding medium, and is made, preferably, of silicon placed in a tube or cover, preferably of glass, in which a vacuum is formed.

Whilst following the formula $R = \frac{\rho L}{A}$, the inventor claims to have found that Joule's law does not give a perfectly exact equivalent of the quantity of heat developed in a conductor. "I have ascertained," he says, "that the quantity of heat is not simply proportionate to the specific resistance of such body, but varies according to the specific heat of the body and also according to the chemical action produced by the passage of the current, as, e.g., oxidation." He, therefore, employs a body of great specific resistance (ρ), which enables the length (L) of the conductor to be decreased and its section (A) increased.

NEW APPLICATIONS.

For week ending January 29.

1,831, J. Bousfield, Grooved Rails for Sliding Doors.
1,841, J. Macdonald, A Tool-handle Rivet.
1,855, A. Gray, Telegraph Cable Grip.
1,879, E. Rosa, Curve Tracer of Electric Measurements.
1,875, E. Edwards, Down-draught Kilns for Burning Bricks, Clay, &c.
1,883, Oils Bros. & Co., Elevators and Lifts.
1,889, Watts & Fothergill, Water Movement.
1,890, J. Jones, Siphon-Rushing

Devices.
1,917, J. Deussen, Tubes.
1,924, J. Walker, Chimney-pots and Ventilating Terminals.
1,932, A. T. Chorley, Sanitary Pipe Traps.
1,941, G. Weay, Appliances for Cleaning Roads.
1,948, T. H. Stubbs, Tiles and other Ceramic Ware (with coloured designs therein).
1,954, J. Waller, a Burglar Alarm Bell.
1,959, G. Pilkington, Braceless Joints.
1,964, E. Beckton, a Detachable Keyed Line Carrier for Window Sashes.
1,966, J. Gammie, Window Frames and Sashes.
1,970, J. G. Dixon, an Electric Switch or Contact Make.
1,971, Wilson & Nicholls, Smoke Cures and Ventilators.
1,982, G. Waller, Metal Doors, Covers, &c., for Inspection Chambers and other Sanitary Appliances.
1,990, Humpage & Jacques, Lamps.
2,000, J. Delisle, Measuring Apparatus.
2,003, L. A. Garceby, Ceramic Stone.
2,011, Batterill & Wells, for Operating the Safety Gages of Hoists and Lifts.
2,018, J. G. Lorrain, a Composition for Building and Decorative Purposes.
2,026, M. Saccardi, Tunnel Ventilation.
2,032-3, J. Pusey, Wrenches and Parallel Pliers.
2,041, J. Boss, Paving and Pavements.
2,046, J. Simpson, Automatic Bath Discharge-valve.
2,061, J. Hannan, and 2,046, Havillands & Farmer, Grain and other Elevators and Dischargers.
2,062, G. E. Bergman, Printing of Plans and Drawings.
2,060, A. W. Trenchard, a Cone Chimney-pot.
2,085, H. M. Hufeland, a Contrivance to Render Windows Draught-proof.
2,087, T. Rees, Door, Gate, and other Fasteners.
2,089, O. Frommann, Automatic Opening and Shutting of Doors.
2,097, J. Carter, "Closure Brick Flemish Bond Brickwork."
2,116, W. Reed, Venetian and Similar Blinds.
2,122, Glashüttenwerke Alderhütten Actien Gesellschaft, Hollow Glass Blocks for Construction of Walls pervious to Light.
2,123, B. Baden-Powell, Locks or Fastenings.
2,144, A. Winton, Lever Hoist.
2,149, Stubbs, Automatic Gas Disconnecter.
2,159, Lucas & Done, an Oil-can.
2,152, T. Smith, Hinges.
2,153, J. Hutchison, Ventilators for Drain-traps, &c.
2,159, Cryer & Baker, Domestic Fire-Places.
2,169, Beech & Melhuish, Gas Cooking and Heating Stoves.
2,181, O. Wanke, a Bridge or Cover for Paint and Similar Brushes.
2,182, P. Lehmann, a Wall and Roof Covering Material.
2,185, Ayre and Others, Pottery Kilns or Ovens.
2,187, W. Defries, Filters.
2,206, F. Gross, a Key-Hole Cover.
2,213, R. Kimmer, Tube and Rod Connections.
2,214, G. Hurlbert, Cross Flushing.
2,217, E. Segall, Self-Closing valves or Cocks.
2,218, A. Mazzoni, Kilns.
2,229, W. R. Mortling, Chisels.
2,236, W. R. Cooney, Sun-Blinds.
2,237, T. L. Thornton, Pipe-Joints.
2,247, J. Hargreaves, Open and Close Ranges and Ovens.
2,257, W. Wright, for Sensing Timber.
2,257, T. Cooper, Ventilating Rooms, Spaces, Mines, &c.
2,272, J. W. Buckley, Fastenings for Brush Handles.
2,282, J. R. Mally, Mouldings.
2,302, W. R. McKay, for Hanging Doors.
2,316, T. L. Mudge, and 2,359, J. Wade, Sash Fasteners.
2,321, James and Dummerston, Serrul Saws.
2,328, Redwood & De Hailes, for Fire-Proofing Wood and Other Materials.
2,331, T. Guttridge, Bricks.
2,339, Dowman, Door-Locks.
2,345, Farr & Payne, Convertible Bench Cover.
2,353, W. S. Petty, a Combined Cider Sifter and Ashes Pan for Domestic Fire Ranges.
2,357, J. Burnett, Baths.
2,373, J. C. Black, Flanged Joints.
2,384, A. G. Hooper, for Preparing and Casting Moulds.
2,379, E. Taylor, a Tool for Forming the Junctions of Tubing with their Sockets.
2,395, Nobes and Tilley, Automatic Gas Disconnecter in Case of Fire.
2,404, H. H. Gardam, Reversible Sliding Window.
2,410, Munro & Proctor, Earthenware Traps or Gullies.
2,419, W. S. Simpson, a Saw or Rasp.
2,420, Liston & Denman, a Window Fastener with Appliance for Operating the same.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 27.—By STIMSON & SONS.

King's Cross.—47, Albion-st., u.t. 46½ yrs, g.r. 8½, £430	
Babury.—34, Albion-grove, u.t. 48½ yrs, g.r. 8½, r. 38½, 320	
177, Bow Common-lane, u.t. 76½ yrs, g.r. 4½, 235	
Holloway.—68½, 69, 69½, and 69½, Holloway-rd., u.t. 60½ yrs, g.r. 4½, r. 25½, 1,630	
Old Kent-rd.—76 and 78, Trafalgar-rd., u.t. 34½ yrs, g.r. 4½, r. 84, r. 72½, 710	
Bruton.—58, Stockwell Park-rd., u.t. 27½ yrs, g.r. 9½, e.r. 50½, 215	
Balham.—110, Bedford Hill, u.t. 78½ yrs, g.r. 14½, 148, e.r. 50½, 260	
31, Fernland-rd., u.t. 76½ yrs, g.r. 6½, e.r. 31, 285	
Charlton, Kent.—6, Maryon-rd., u.t. 31½ yrs, g.r. 4½, r. 26½, 250	
Hornerton.—53, Holmbrook-st., u.t. 28½ yrs, g.r. 2½, 55, 110	
Balham.—66, Rossiter-rd., u.t. 76½ yrs, g.r. 9½, 98, e.r. 36½, 250	
99, 100, and 102, Fernland-rd., u.t. 76½ yrs, g.r. 28½, 188, r. 88½, 640	
10, Byrne-rd., u.t. 77½ yrs, g.r. 10½, 108, r. 36½, 335	
Tooting.—155 and 157, Trinity-rd., u.t. 84½ yrs, g.r. 25½, e.r. 100½, 305	
Wimbledon.—204 and 206, Merion-rd., u.t. 82½ yrs, g.r. 15½, r. 60½, 405	
Hy Tooth & Tooth (on the premises).	
St. John's Wood.—42, Queen's-rd., u.t. 39½ yrs, g.r. 30½, e.r. 85½, 300	
By HENRY HENDRICKS (at Birmingham).	
Birmingham.—Cambridge-st., &c., 1 g.r. 50½, 98, u.t. 22½ yrs, g.r. 22½, 126, 6d, with reversions 3,050	
By NOTT & CARTWRIGHT (at Balham).	
Tooting.—Bickersteth-rd., a freehold building plot Wimbledon.—11, 15, 17, and 19, Trinity-villas, u.t. 98½ yrs, g.r. 3½, e.r. 160½, 1,830	
By J. H. BETHELL (at East Ham).	
Manor Park.—Church-rd., &c., 80 plots of building land, 6,203	
January 28.—By WYATT & SON (at Emsworth).	
Emsworth, Hants.—Havant-rd., "Western Villa," 1, 900	
By PERKINS & SON (at Southampton).	
King's Somborne, Hants.—"Place Farm," 80 a. 2 r. 18 p., f., 4,450	

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Primitives.	Designs to be delivered.
Public Baths	Winchester T.C.	25, and 10c. premiums....	Feb. 25

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Machine-up, Paving, Metalling Road.	Watford U.D.C.	Engineer's Office, 14, High-street, Watford.	Feb. 15
Additions "Station" Hotel, Inverness, N.B.	Highland Ry. Co.	James & Macleod, Archt. Queen's-gate Chambers, Inverness.	do.
Machine Works and Buildings.	Fanton-road, Kingcross, Halifax.	F. L. Patchett, Archt. George-street Chambers, Halifax.	do.
Granite (5,000 tons)	Chertsey (Cants)	J. Dana, Surv. & North-bridge, Chertsey.	do.
*Works and Materials	Tottenham U.D.C.	Burgh Road, 1, Parliament-square, Edinburgh.	Feb. 16
Sewerage Works, Albert-street, &c.	Edinburgh Corp.	W. Warner, Kingston-road, Ham (Surrey) U.D.C.	do.
Sewerage Works	Ham (Surrey) U.D.C.	J. Berry, Archt. & Queen-street, Huddersfield.	do.
Two Houses, Spalme-road, Farnham, Yorks.	Capt. R. Watson.	S. Dyer, Archt. Quay-road, Bridlington.	do.
Stores, West-street, Beilington Quay.	.....	.....	do.
*Works and Materials (various)	Hampstead Vestry	St. Luke's Vestry, City-road, E.C.	do.
*Works and Articles (various)	St. James Vestry	T. H. Manney, Vestry Hall, Piccadilly.	Feb. 17
*Ballast, Gravel, and Hogg	Watlington	C. J. Ferguson, 42, Clarendon-street, W.	do.
*Erection of Portion of Stone Church.	.....	J. Stevens, 30, Market-street, Manchester.	do.
*Alterations to School	Macclesfield Corp.	T. H. Yablon, C.E. 21, Prince-street, Bristol.	do.
Alterations to Market, &c.	Bristol Corp.	G. Baglefield, Archt. Mayport.	do.
Alterations to Business Premises.	.....	E. J. Bennett, Archt. 24, Dalmeida, Gravesend.	do.
Gravel, near Mayport	W. Laird	S. Penberthy, Dist. Surv. Stirling, Naird.	do.
Markets and Fire Engine Station	Gravesend T.C.	Woodman & Williams, Archt. Penryn.	do.
Road Materials	Smallburgh R.D.C.	G. D. Oliver, Archt. 5, Lower-street, Carlisle.	do.
Forty-four Houses, Poynderen, Merioneth.	Gwallogriddig Blding Club	J. Williams & Son, Archt. Carlisle.	do.
Additions to Bishop Goodwin Memorial School, Carlisle. ....	.....	.....	do.
Vestry at Church, Corwen, Wales. ....	.....	.....	do.
*Alterations to Asylum	Poplar and Stepney Sick Asylum	J. & S. F. Clarkson 125, High-street, Poplar.	do.
Church, Savile Town, Dewsbury, Yorks. ....	.....	C. J. Ferguson, Archt. 42, Clarendon-street, South Kensington.	do.
School, Gwallogriddig, Wales.	Pentymen Sch. Bd.	E. M. B. Vaughan, Archt. Cardiff.	do.
Alterations to Premises, Hampden, near Eilat, Lancs.	Stockport Corp.	A. Austin & Pacey, Archt. Lancaster.	do.
Granite Sills, &c. ....	.....	J. Atkinson, C.E. Central Buildings, St. Petergate, Stockport.	do.
School	Frinton (Essex) S.B.	E. T. James, Frinton-on-Sea.	do.
Technical Schools, Lower Kelvin, Dublin.	Governors	W. M. Mitchell, & Co. 5, Leinster-st., Dublin.	do.
Three shops, Fleece-street, Kelghley.	Princes Mills Co. Ltd.	W. A. B. Baber, Archt. 1, Scott-street, Kelghley.	do.
Soap Works, Thwaites, nr. Kelghley, Yorks. ....	.....	Barber, Hopkinson & Co. Kelghley.	do.
Granite Kerbing	Brighton Corp.	F. J. C. May, C.E. Town Hall.	do.
Sewerage Works	Uxbridge R.D.C.	F. Artlett, C.E. 17, Victoria-st., Westminster, S.W.	do.
House, St. Thornhill Edge	Bolton & Deane Indus. Soc. Ltd.	Westgate, Dewsbury.	do.
County Schools, Elbow Vale, Mon. ....	.....	The Elbow Vale School, Off. Elbow Vale.	do.
Three Shops, Fish Market.	Darwen (Lancs) Corp.	W. R. W. Saville, Boro. Surv. Darwen.	do.
House, Tyller-street, Forth, N.B. ....	.....	R. & Macleod, Archt. Inverness.	do.
Road Materials	Holland (Lincs) C.C.	E. C. Johnson, Sessions House, Boston.	do.
Two Pavilions, Tara Close.	Ulverston (Lancs) Cricket Club	By. Ross, Archt. Cannon-street, Accrington.	do.
Additions to National School, Settle.	Managers	C. F. A. Wood, Church-st., Settle.	do.
Additions to Grammar School, Woodbridge. ....	.....	C. F. A. Wood, Church-st., Settle.	do.
Deriving House, Rhodes street, Halifax.	Willis & Co.	C. E. L. Horsfall & Son, Archt. London.	do.
Offices, St. Thomas, Exeter. ....	.....	C. E. L. Horsfall & Son, Archt. London.	do.
Business Premises, Market-street, Omaha.	Graham, Son, & Wilson.	W. N. Blair, Vestry Hall, Lancaster, N.W.	do.
*Works and Materials (various)	St. Pannas Vestry	F. Faxon, Boro. Surv. Town Offices.	Feb. 21
Refuse Destructor	Plymouth Corp.	Town Hall, Plymouth.	do.
Marshall Stone	Banbury T.C.	A. E. White, C.E. Town Hall, Banbury.	do.
Macadam	Hill Corp.	G. F. Lyall, Boro. Surv. Burton-on-Trent.	do.
Sewerage Works, Burntwood.	Burntwood-on-Trent Corp.	J. C. Cartwright, Boro. Surv. Town Hall.	do.
Sewer	Bury (Lancs) Corp.	C. Denney, Engineer. 2, F. H. Minto, Surv. 1, Hill-end Road, Altrincham.	do.
School, Tredgar, Mon.	County School Managers	E. B. Frost, County Boro. House, E. glin.	do.
Making Two Blocks, Carmyllie, Arbroath, N.B. ....	.....	W. J. Wilson, Archt. 1, Belmont, Bath.	do.
Villa, Elgin, N.B.	Bath Sch. Bd.	W. B. Woodhead & Son, C.E. 2, Exchange-buildings, J. P. Phillips & Son, Archt. 1, Royal-alley, Belfast.	do.
Additions to School, Oak-street.	Donaghmore (Yorks) U.D.C.	E. W. Knocker, C.E. 2, Hill-house, Dover.	Feb. 22
Walling, Doe Park .....	.....	J. Mansergh, S. Victoria-street, S.W.	do.
School Work, The Mall, Armagh.	Working Corp.	E. J. Ford, C.E. Council Offices, New-road, Portland.	do.
*Concrete Road to Reservoir	Portland U.D.C. ....	.....	do.
Water Work .....	.....	.....	do.
Stene	Bridgewater R.D.C.	Mr. Ingram, Surv. Commission, Somerset.	do.
Sewerage Works, London-road	Dover T.C.	R. R. R. Town Hall, Dover.	do.
*Materials (various)	C. A. West Ham.	R. R. R. Town Hall, Dover.	do.
*Works and Materials	Hackney Vestry	J. Lovgrove, Town Hall, Hackney.	Feb. 23
Road Materials	Levensham (Lancs) U.D.C.	J. J. Jenson, C.E. Union-road, Stockport.	do.
Harbour Works, Backpool, Bucks. N.B. ....	.....	W. C. Robertson, 22, Barnet-st., Bucks. Bankers.	do.
Warehouses, at Clough House Mill, Huddersfield. ....	.....	E. K. & S. Archt. Huddersfield.	do.
Additions to Police Station, Budeigh, Salterton.	Devon Standing Joint	E. H. Harbottle, Archt. Queen-street, Exeter.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
School, Preston.	Royal Cross School for the Deaf	James & Green, 55, North-gate, Blackburn.	Feb. 2
*Hardwood Paving, Flagging, Curb line, &c.	Kinaston-on-Hull Corp.	A. E. White, Town Hall, Hull.	do.
Additions to Schools, Parwell, Yorks. ....	.....	W. H. Haislett, Archt. Strath-road, Batley.	Feb. 2
Sewerage Works, North Wales.	Pennamannaw U.D.C.	W. Worrall, Bury Council Offices, Pennamannaw.	do.
Additions to Church, Marsden, near Huddersfield. ....	.....	J. Kirk & Sons, Archt. Huddersfield.	do.
Bridge Works, Bridge-street, &c.	Lalcester Corp.	E. C. Mansley, C.E. Boro. Surv. Town Hall.	Feb. 2
Electric Lighting Station, James-street. ....	.....	W. C. Mansley, C.E. 38, Fisher-street, Carlisle.	do.
*Articles and Materials	Walthamstow U.D.C.	G. W. Holmes, Town Hall, Walthamstow.	do.
*Marshall Granite	Thames R.D.C.	J. Goodenough, Thames.	Feb. 2
*Oil Engine, &c. Pump	Horsley U.D.C.	J. Mansley & Son, Victoria-street, S.W.	do.
*Erecting at Hospital .....	.....	E. J. Lovgrove, Offices, South-west-lane, Highbury.	do.
*Painting Lamp Columns and Street Name Plates .....	.....	do.	do.
Additions to Chapel, Pilsb, Glam. ....	.....	do.	do.
Five Almshouses and Offices	Boro. of Lyme Regis.	C. Dyer, 146, High-street, Gylmer, Poole.	do.
Bridge, Strid's Water, Weston Fitz-paine. ....	.....	Concill Rooms, Lyme Regis.	do.
Sewerage Works, near Leeds.	Bridport R.D.C.	Bridport.	do.
*600 tons Wrought Steel Pipes	Hullam Corp.	S. Shaw, C.E. Dewsbury.	do.
*Laying-out Site and Erecting Buildings. Pavilions, &c.	Malvern Hospital Com.	Thames R.D.C.	do.
Five Houses, Pitt-street.	Lowesay Corp. Soc. Ltd.	Thames R.D.C.	do.
Additions to Court House, Llan-wal. ....	.....	Thames R.D.C.	do.
*Bathing Post Office, Douglas, Isle of Man.	Gunnar, H. M. Works.	12, Whitehall-place, S.W.	do.
*Water Tower, Wells, Pumps, Engines, Fire Hydrants, &c.	Walsley School Dist.	A. Ansell, 21, Buckingham-street, Strand, W.C.	Mar. 2
Office Sewer, Alexandra Park .....	.....	W. F. Fothergill, C.E. 1, Fothergill-st., W.C.	do.
Schools	Thornbury (Glos) Sch. Bd.	Thornbury (Glos) Sch. Bd.	do.
*Extension of Middlebrough Dock.	N.E. Ry. Co.	Sir J. Wolfe, Barry, 21, Leabury-st., West-street.	do.
*Construction of Bridge and Approaches and Station Buildings, Fallow, near Buntingford. ....	.....	C. A. Harrison, Central Station, Newcastle-on-Tyne.	do.
School, Marlborough-road.	Cardiff Sch. Bd.	Habersham & Pawker, Archt. Fallow-st., Cardiff.	do.
Sewerage Works	Oldham Corp.	S. A. Fothergill, C.E. 1, Oldham-st., Oldham.	do.
Road Materials	Brackworth (Northants) R.D.C.	W. C. Woodford, 18, Market-square, Northampton.	Mar. 3
Widening Bridge, Regent-road.	Salford Corp.	Borough Engineer, Northampton.	do.
*Sewer Pipes, Gully Traps, &c.	Bath U.S.A.	Salford Corp.	Mar. 3
*Various Materials	Barrowby Vestry	Bath U.S.A.	do.
Additions to Coal Stores, Lapp's Quay, Cork.	Dartford Union	Bath U.S.A.	do.
Additions to Engine Premises, Welsh-street, & Belfast.	A. Sutton	Dartford Union	Mar. 14
Contingentary Barrack, Ballinaghy, Co. Galway.	W. T. M. Mear, Archt.	W. T. M. Mear, Archt.	No date
Office, Millway-road, &c. Stonehouse, Devon.	Waterford County Assoc. Ltd.	Waterford County Assoc. Ltd.	do.
Stores and Three Houses, Mills Hill, Lagos.	Midland and Tanga Indian Corp. Soc.	Waterford County Assoc. Ltd.	do.
Wine, n Hall and Two Shops, Oldham-road, Miles Platting.	Committee	Waterford County Assoc. Ltd.	do.
Messengers' Club, Haslingden, Lancs. ....	.....	Waterford County Assoc. Ltd.	do.
Bridge and Landing Stage, Rock Ferry.	Birkenhead Corp.	Waterford County Assoc. Ltd.	do.
Eight Houses, Victoria-terrace, Brixton, S.W. ....	.....	Waterford County Assoc. Ltd.	do.
Five Houses, Brunel-street, Leeds. ....	.....	Waterford County Assoc. Ltd.	do.
Warehouse, Cooke-street, Kelghley. ....	.....	Waterford County Assoc. Ltd.	do.
Additions to Kyles House, Kylesham, Inverness. ....	.....	Waterford County Assoc. Ltd.	do.
Additions to Roy Bridge Hotel, Lochaber, N.B. ....	.....	Waterford County Assoc. Ltd.	do.
Additions to Inishlagh Lodge, Barra, N.B. ....	.....	Waterford County Assoc. Ltd.	do.
Two Semi-detached Houses, Lowland-road, Inverness. ....	.....	Waterford County Assoc. Ltd.	do.
Par Semi-detached Villas, Forlay, Yorks. ....	.....	Waterford County Assoc. Ltd.	do.
Schools, New Hirst	Ashington Coal Co.	Waterford County Assoc. Ltd.	do.
Church, Ballynaghy, Ireland. ....	.....	Waterford County Assoc. Ltd.	do.
Twelve Cottages, Goose-Belt-street, Rownham, Glouce. ....	.....	Waterford County Assoc. Ltd.	do.
Pair Semi-detached Villas, White-road, Belfast. ....	.....	Waterford County Assoc. Ltd.	do.
House and shop, Eastbourne. ....	.....	Waterford County Assoc. Ltd.	do.
Four Semi-detached Cottages, Aberfan, Wales. ....	.....	Waterford County Assoc. Ltd.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applying time to be taken.
*Chief of Works	Tottenham U.D.C.	£1 10s. per week.	Feb. 1
*Inspector of Works	Hereford Vestry	£100. per annum.	Feb. 1
*Inspector of Nuisance	North T.C.	Inspector 2d. and Sub-Inspector 2s. 6d. per week.	Feb. 1
*Borough Engineer and Surveyor.	South Shields T.C.	£500. rising to 700s. per ann.	Feb. 2
*Clerks of Works (four)	Manchester Corp.	4s. 6d. per week.	do.
*Assistant Superintendent for Sewerage Works	Willesden U.D.C.	27. per week and residence.	Mar.
*Surveyor	St. Marylebone Vestry	£200. per annum.	do.
*Assistant Surveyor .....	.....	do.	do.
*District Surveyor .....	.....	1500. per annum.	do.
*Clerk of Works	Sandwich U.D.C.	do.	No date

Those marked with an asterisk (*) are advertised in this Number. Competition, pp. iv. Contracts, pp. iv, vi, vii, viii, & ix. Public Appointments, pp. xviii, & xxi.

BURDETT-ROAD Congregational Church School.—Adapting premises for a temporary school:—
 T. P. Holliday £35 0
 J. Kybett 45 0
 G. Barker 45 0
 T. H. Jackson 45 0

CANTERBURY ROAD—Providing lavatory, cloak-room, additional lavatory accommodation, and skylights in classrooms:—
 J. E. Ford £40 0
 W. V. Gend 60 0
 W. Hammond 53 0
 E. Triggs 53 10

CHILDERIC-ROAD.—Enlargement—Boys, 11¹/₂ girls, 11¹/₂ infants, 128; total, 255:—

F. P. Buiell & Co.	£145 0	Extra for building brickwork in cement.	£50 0
Holloway Bros.	34 0		12 0
W. Down	14 0		0 0
F. & H. F. Higgs	3 10 0		8 0
J. Shillito & Son	3 12 0		24 0
Holliday & Greenwood	3 10 0		0 0
R. Triggs	12 0		0 0
J. & C. Bowyer	3 10 0		51 0

DALGISH STREET—Providing and fixing hot-water radiators in corridors (boys, girls, and infants), and in one classroom (boys and girls) respectively, and two classrooms (infants) and fixing tubular boilers:—
 J. C. & J. E. Ellis, Ltd., £140 0
 J. Gray 140 0
 Convey Ching & Co., £134 0
 J. Davies & Sons, Ltd., 135 0

EDINBURGH-ROAD—Providing at J. fixing hot-water coils in corridors, and fixing tubular boilers:—
 Rovers & Russell, Ltd., £100 0
 J. & F. May 100 0
 J. Gray 99 0
 Vaughan & Brown, Ltd., 88 0
 Convey Ching & Co., 88 0

COPSALL STREET—Erecting cookery and laundry centres with water closets for girls attending the centres, and enclosing, draining, and tarping the additional land:—

Willmott & Son	£120 0	Extra for building brickwork in cement.	£24 15
W. Shumper	2 12 0		0 0
H. Knight & Son	2 12 0		0 0
G. S. & Williams & Son	2 12 0		0 0
I. Grover & Son	2 12 0		0 0
McCormick & Sons	2 12 0		0 0
T. L. Green	2 12 0		0 0
E. Lawrence & Sons	2 12 0		0 0

HARWOOD-ROAD (infants).—Fixing tubular boilers, and four large S.B. stove fronts. (Boys)—Fixing four large S.B. stove fronts:—
 Convey Ching & Co., £153 10
 J. Wootton-Smith, Gray & Co., 103 15
 W. G. Cannon & Sons, 98 15

JESSOP-ROAD—Providing teachers' closets outside building and re-connecting existing closets to children's offices, and providing drainage:—
 J. Gerrard & Son £1,335 0
 W. & H. Castle 1,337 0
 Johnson & Co. 1,338 10
 J. & C. Bowyer 1,338 0

ROYAL HILL.—New school—Boys, 150; girls, 150. Infants, 200, total, 500:—With school-keeper's house:—

Foster & Dickson	£1,300 0	Extra for building brickwork in cement.	£114 0
Edwards & Medway	13 0		12 0
J. Shillito & Son	13 0		12 0
F. & H. F. Higgs	13 0		12 0
I. & M. Patrice	13 0		12 0
G. E. Wallis & Sons	13 0		12 0
L. Lawrence & Sons	13 0		12 0
Kirk & Randall	13 0		12 0
Treasure & Son	13 0		12 0

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LANT-STREET.—Providing and fixing hot-water coil in Infants' classroom, and fixing tubular boiler:—
 W. G. Cannon & Sons £145 0
 J. G. Davie 145 0
 J. G. Davie 145 0
 J. C. & J. S. Ellis, Ltd., 145 0

ROYAL NORMAL COLLEGE.—Repairs to buildings, &c., on a running contract:—
 W. G. Cannon & Sons £40 0
 J. & C. Bowyer 40 0
 J. G. Davie 40 0
 J. G. Davie 40 0
 J. G. Davie 40 0
 J. G. Davie 40 0
 J. G. Davie 40 0
 J. G. Davie 40 0

WESTON-STREET.—Providing and fixing a partition to divide large room in girls' department:—
 J. G. Davie £100 0
 J. G. Davie 100 0
 J. G. Davie 100 0
 J. G. Davie 100 0
 J. G. Davie 100 0
 J. G. Davie 100 0
 J. G. Davie 100 0
 J. G. Davie 100 0

WESTON-STREET.—Providing and fixing hot-water coils, and fixing S.B. stoves in two large classrooms (boys) and one large classroom (girls) and fixing tubular boilers; fixing S.B. stoves in one large classroom (infants):—
 J. & F. May £120 0
 J. & F. May 120 0
 J. & F. May 120 0
 J. & F. May 120 0
 J. & F. May 120 0
 J. & F. May 120 0
 J. & F. May 120 0
 J. & F. May 120 0

TO CORRESPONDENTS.

1. T. & M. (amounts should have been stated).—W. S. W. (below our line).—B. & C. (amount should have been stated).—J. M. & Co. (we cannot publish reports of litigation proceedings by one of the parties in such proceedings).
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FEB. 17, 1892.

ILLUSTRATIONS.

Bradford Architecture:—

The Town Hall (Messrs. Lockwood & Mawson); Market-street, showing the Exchange	Double-Page Ink-Photo.
The Yorkshire Penny Bank (Mr. J. Ledingham)	Single-Page Ink-Photo.
St. George's Hall (Messrs. Lockwood & Mawson) and The Bradford Banking Company (Messrs. Andrews & Delaunay)	Single-Page Ink-Photo.
The Technical College (Mr. T. C. Hope); The Market (Messrs. Lockwood & Mawson); and London and Midland Bank (Mr. J. Ledingham).....	Double-Page Ink-Photo.
St. John the Evangelist Church (Messrs. T. H. & F. Healey); The Post Office; The Prudential Assurance Buildings (Messrs. A. Waterhouse & Son); The Mechanics' Institute (Messrs. Andrews & Pepper); All Saints' Church (Messrs. T. H. & F. Healey); and St. Clement's Church (Mr. E. P. Warren)	Double-Page Ink-Photo.

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The Architecture of our Large Provincial Towns.

XIII.—BRADFORD.



BRADFORD is one of those towns which have practically grown up during the modern manufacturing era, and which, in an architectural sense, have no history to speak of before the present

century. The only ancient structure of any importance is the parish church of St. Peter's, a late fifteenth century church with a very poor nave arcade, and which has externally gone through two or three modern repairs or restorations, the last in 1870. The tower, of which we give a sketch (fig. 1), is a low-proportioned but solid-looking erection which derives a good deal of character from the treatment of its buttresses, and is by far the best portion of the church; a local guide-book states that it is "about fifty years later" than the body of the church; we should imagine the truth to be the other way. The site is traditionally said to have been occupied by a Norman church previously, which is quite possible, although the history of the town has not apparently been traced back to the Norman period; at all events there was no doubt an earlier church, whether Norman or not, on the same site, since a charter for holding weekly markets in the town was granted as early as 1256, so that

the place must by that time have been a recognised centre in the district. The special tendency of Bradford towards a trade in clothing stuffs seems to have been noticeable in Leland's time, who records "it standith much by clothing"; and later, in 1773, the "Piece Hall" was erected specially for the sale of "pieces" of cloth; its name and position still have record in the narrow passage called "Piece Hall Yard," opening out of Kirkgate.

The modern growth of Bradford, however, only commenced with the early days of the present century, and probably received its first impulse from the establishment of the Low Moor and Brierley iron-works (afterwards incorporated into one concern) in 1788 and 1810 respectively, for though Bradford is not itself an iron-working city, the near neighbourhood of these great iron-works, almost at its gates, must have indirectly promoted the increase and importance of the town; and accordingly it is just at this time, in the first years of the present century, that we find a Board of Commissioners established for providing for the lighting and cleansing of the town, their powers remaining in force till the incorporation of the town in 1847. The dignity of a "city" Bradford obtained officially only last year.

The tendency of towns in the undulating country of the Yorkshire moors is, naturally, to settle down in the low ground between the hills, where there will be shelter from the bleak air of the uplands, and tolerably level communication, by means of the valleys, with other places; and in its earlier days Bradford must have presented the same appearance which some smaller towns in the district still present; a collection of buildings in a dip of the country, surrounded by rising

ground. In its present condition it has to a considerable extent climbed the slopes, though the most important portion of the city still remains that on the original low level. It is one of the most irregular of cities; not a straight line or a central axis in it; and the main streets which radiate from the centre probably follow to a great extent the lines of old country roads. This irregularity is one of the main characteristics of Bradford; even the so-called "squares" are merely irregularly-shaped openings left between the lines of three or more streets; even in the suburban districts there does not seem to be a single instance of a symmetrically planned square or open place. Two local circumstances further affect the architectural character of the city. Bradford is almost built, one may say, on a stone quarry, and consequently stone is so plentiful that brick is nowhere to be seen though probably used for backing the external walls in the best class of buildings; to the eye it is completely a stone town. In the smaller buildings a great deal of what may be regarded as quarry "spoil" is used in thin courses which, where the walls are discoloured by smoke and weathering, have at a distance somewhat the appearance of brickwork, though on closer inspection it is seen that the courses are much more irregular both in depth and in the length of the stones. This coursed stonework in thin courses of varying depth, and with long and short pieces disposed just as they come to hand, is in itself a more picturesque form of walling than is furnished by ordinary brickwork, but unfortunately it is the only picturesque element in most of the smaller street houses, which are in general style as



Fig. 3.—The Swan Arcade (Messrs. Milnes & France).

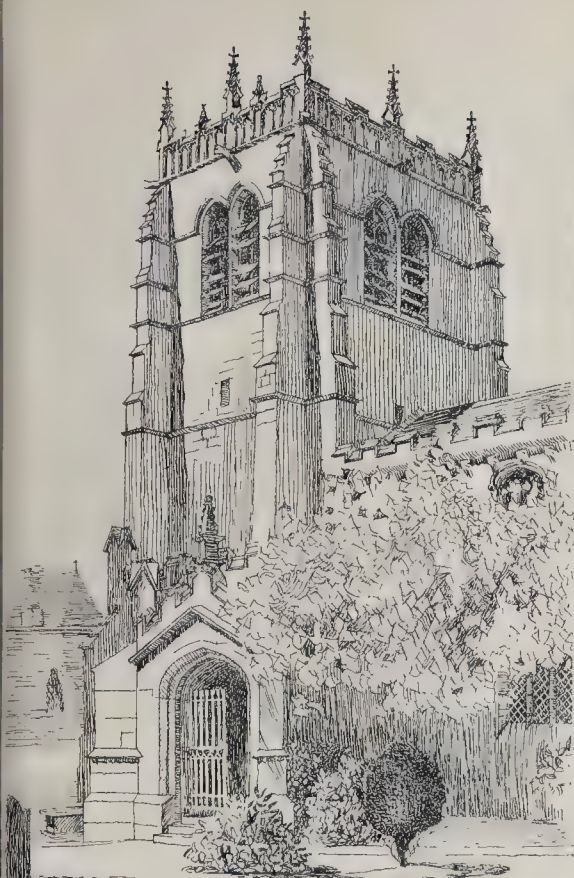
uninteresting and mechanical as can well be. That houses built of this irregular stone work might have a pleasing and picturesque appearance without any additional cost is shown by the example of a few of the older houses at Horton Green, probably built before the town had stretched up to this point. These, with their mulioned windows, or sash windows in small panes (both arrangements are seen), are really pleasing and picturesque, and all the streets of small houses in the modern town might have been the same, whereas they have only the air of commonplace respectability and dulness. This is one among other indications afforded by Bradford, that the mental or moral atmosphere of a manufacturing town is not favourable to a feeling for the picturesque of architecture. The other influence referred to is the requirement for large mills and warehouses, which form a very important feature in the street architecture of the city. These, in the best streets, are built of hewn stone and in a somewhat dignified style, and would impart an air of distinction to the city but for two drawbacks—the sombre hue which they assume from weather and smoke stain, and the insufficient width of the streets. Well-street and the western portion of Leeds Road, for instance, are nearly lined with these large stone warehouses, but the streets are not wide enough to give them their full effect, and the result, combined with the sombre tone, as aforesaid, of the masonry, is depressing. It is true that these warehouse buildings are not for the most part treated with very great architectural originality or character, but that they would nevertheless have their effect in

a fresher stone and with a wider space to see them in is evident from the instance of the great new block at the top end of the street called Cheapside. This building, a wool-merchant's warehouse, is very simply treated—the first floor windows with a cornice mould surmounted by a small pediment, the next tier with the cornice only without the pediment, the remaining windows perfectly plain openings, and the whole crowned by a very simple and unpretending cornice; yet this great mass of new stonework of admirable workmanship, seen at the top of the open street flanked by the Midland Station-yard, has a really striking and almost grand effect, though it will no doubt lose much of this when the stone gets smoke-blackened. The originating cause of this darkening of the stone is symbolised in the number of tall chimneys which, though not found quite in the centre of the town, are conspicuous in every comprehensive view of Bradford from higher ground, and give a peculiar effect to the picture; not the less so that some of them are visibly out of the perpendicular.

The Town Hall, completed in 1873, from the designs of Messrs. Lockwood & Mawson, who gained it in a competition which excited great interest in the architectural world at time, stands, like everything else at Bradford, at an oblique angle with its surroundings, along one side of a nearly triangular space, which is called "Town Hall Square." The lithograph illustration (from a photograph) may serve to remind readers who have forgotten it of the character of the building. Though designed in a style of revived Gothic the taste for which has now evaporated, it must be admitted to be an exceedingly

favourable specimen of its school, and one of the best provincial town halls of its date. There is a breadth and unity of treatment about; the several tiers of windows are well contrasted, the middle tier emphatically indicating the principal floor. The weak point is in the treatment of the ends; they should have been raised and emphasised more; as it is the design looks as if it were suddenly cut off at the ends, and there is nothing to balance the tower and the centre pavilion. The tower, which, in its general lines and effect is an obvious reproduction of that of the Palazzo Vecchio at Florence, is a conspicuous object from many of the streets, and its decidedly mediæval style and outline suit very well with the irregular character of the city; looking back along Market-street, for instance, with the tower of the Exchange in the foreground and that of the Town Hall peering over the houses to the left of the distance, the effect is very picturesque. There is nothing else of much interest in Town Hall Square; at the upper end there is an example, in a small inn, of what seems to be a bit of old Bradford street architecture, a low front with two semi-circular bays going up to the eaves; and at the under end, opposite the east wing of the Town Hall, is the respectable but uninteresting Mechanics' Institute, a heavy Class-

* This view up Market-street is shown in the small illustration in the corner of the Town Hall lithograph, but it does not convey the real effect; street photographs are nearly always, as in this case, deceptive as to distance and perspective; Market-street is really a rather short street, and the Town Hall appears much higher up in the air, to speak, from that point, or much closer, than it seems in the photograph. On the right in the foreground is seen Bradford Old Bank, one of Mr. Waterhouse's early buildings.



THE PARISH CHURCH.

Fig. 1.

building; and at the street angle beyond this is Messrs. Waterhouse & Sons' Prudential Assurance building (see lithograph), a complete interloper in Bradford, architecturally speaking, for it ignores the local style and materials altogether, being a brick and terra-cotta building in the usual "Prudential" style, and one of the best and most elegantly designed which its architects have produced. We presume that, as with branch post-offices built in different towns by the Office of Works, it is considered by the Prudential Assurance Company that their offices in every town should bear an unmistakable family likeness; otherwise the accomplished architects would perhaps agree with us in thinking that it would have been of more interest to have taken the local materials and treated them in a manner in accordance with the general character of the city.

Turning to the right round the east end of the Town Hall, we find in Bridge-street the "flank front" (as a military writer would put it) of St. George's Hall, the principal meeting hall of Bradford (for the Town Hall contains no large hall) also from the designs of Messrs. Lockwood & Mawson, but built twenty years earlier than the Town Hall, before the

Gothic revival fever had fully developed. Our lithograph shows rather too much of the somewhat bald end elevation of the building and too little of the street façade, which is quite one of the best bits of architectural design in Bradford, and as good and refined a piece of "Classic" as any town in England can show. It is "academic" architecture of course, but it is thoroughly good of its kind, well proportioned as a whole, and refined and effective in detail. The exterior agrees better with the interior than is sometimes the case in Classic designs of this school, as the lower cornice, beneath the Order, pretty nearly represents the floor level of the concert room, which is reached by stairs direct from the outer doors, the intermediate portions of the basement being shops or offices. The hall is well designed for acoustics; the decorative treatment is much what one finds in many Classic concert-halls of that period; neither worse nor better.

The two principal streets of the city are Market-street, running north-easterly from the Town Hall to Forster-square (which, like Town Hall-square, is triangular), and Kirkgate, which, from a more northerly point, joins the end of Market-street at the "square."



A WAREHOUSE IN LEEDS ROAD.

Fig. 2.

The general aspect of Market-street is dignified, and it includes some important buildings, notably the large Exchange building (which stands on the site of the old market), on the north-west side of the street, and on a nearly triangular site between the junction of Market-street and "Hustlergate," a singularly appropriate name, whatever its origin, for the neighbourhood of an Exchange.* The Exchange is also Messrs. Lockwood & Mawson's (date 1867), but by no means equal to the Town Hall; it is a rather coarse and violent piece of revived Early Gothic of somewhat French tendencies, with large polished granite columns and big "early pointed" windows with plate cusping, a row of heads in high relief sticking out of medallions only just large enough to contain them, as if they were looking through collars, have an almost ludicrous effect. Internally the space is divided into three aisles, with a rather heavy but not ineffective open timber roof. In spite of coarse detail, however, the Exchange is redeemed by the bold treatment of its narrow end, with the tower with a vaulted open porch at the ground level and the clock stage and spire above; when you are far enough off from this it makes an undoubtedly picturesque and effective feature in the street view. Other buildings to be noticed in Market-street are the London and

* In Chicago and some other very advanced America cities, to do business actively is to "hustle." Is there any etymological connection between that expression and "Hustlergate"?



Fig. 4.—A Warehouse (Mr. G. Corson).

Midland Bank on the south-east side (see lithograph), an effective free Classic front—the column and pilaster in the middle stage of the design are rather too long in proportion; the front of the Swan Arcade (fig. 3), a rather extensive arcade with a double "transept;" the Bradford Old Bank (already referred to), on the north-west side, a round-arched Gothic building of Mr. Waterhouse's earlier manner—added to by Mr. Ledingham, effectively contrasted with the Classic "Bradford District Bank" on the opposite side, by Messrs. Milnes & France, a building with some good treatment in detail, especially in the design of the ground floor piers. Kirkgate, in spite of its picturesque and old-sounding name, con-

tains no building of particular interest; the principal façade of the modern market (see lithograph) fronts on it, also by Messrs. Lockwood and Mawson, who seem "in the brave days of old" to have had things pretty much their own way in Bradford; but considering that these buildings were erected at about the same time as the Town Hall, one would say that the architects' strength had gone out of Classic into Gothic; the façade is simple, pleasing enough, but entirely devoid of force or character.

Behind the Exchange, in Hustlergate, the Bradford Joint Stock Banking Company's building shows a powerful example of revival Gothic of rather French type, with deeply revealed pointed windows with double

recessed nook shafts of polished marble on each jamb, a building exceedingly well carried out according to its type, and in a large and liberal manner. Coming down into Forster-square, one finds a place with architectural and picturesque possibilities which have unfortunately only been very partially realised. In the centre is a bronze frock-coated statue of W. E. Forster, from whom the place is named, with finger up as if marking a point in a Parliamentary speech; around his pedestal is a dreary little attempt at some ornamental beds and walks. The south side of the triangle is occupied by large dingy-looking stone-fronted warehouses; the north side by the flank of the Midland Company Station and Hotel, at present in new stone-



Fig. 5.—Wool Warehouse, Commercial-street (Mr. Rhodes Calvert).

at will also become sombre in time of course—and highly creditable to their architect, Mr. Trubshaw, considering what railway hotel and station architecture usually are. The hotel and the side façade of the station are at least unpretentious and in good taste, only why did they spoil the whole thing by that great glaring blue and white enamel name-board over it? It would surely have been possible to have made the name of the station part of the architectural design, in a

decorative manner; that blue and white name-board spoils the whole square, and quite unnecessarily. At the east end of the place, the base of the triangle, is the Post-office (see lithograph), built a few years ago by the Office of Works, and more agreeable than some of their post-offices, because less pretentious; the hiping of the central roof, however, so as to leave a gap between that and the end pavilions, is imitating one of the worst and commonest faults in con-

temporary French architecture. By the side of the Post-office is a gateway in modern late Gothic style, with good wrought-iron gates, giving access to a fine wide stone staircase in several returned flights, within retaining walls decorated with a small arcading, and forming the approach to the terraced churchyard of the parish church on the higher level. This is a very well-managed piece of work, carried out by Messrs. Milnes & France. The old tower



Fig. 6.—Beckett's Bank (Messrs. Milnes & France).

of the parish church, on the higher level, looks over the top of the Post-office building with picturesque effect,* and makes an important addition to an *ensemble* which, in spite of drawbacks, is certainly a good bit of town scenery.

In Leeds-road (the portion of it within

* The tower ought to show thus in our small view of the Post-office; why it does not we cannot say, unless the photographer wiped it out to give more effect to what he probably regarded as the more important building.

the city) and Well-street are some of the largest of the street warehouses. Of one of those in Leeds-road we give a sketch (fig. 2), but though this is now a warehouse we should doubt if it was built as such; it looks more as if it had been originally erected as a public building of some kind, and subsequently turned into a warehouse; it is at all events a good bit of Classic architecture of the old school. Messrs. Bottomley's warehouse in Leeds-road is a dignified stone front with

round-arched windows, and in Well-street the Titus Salt warehouse is a good build, plain but solid in appearance. What the buildings want, however, is character; they have not the warehouse character they might do just as well blocks of offices of the usual kind. Mr. Corson, of Leeds, has sent us a drawing of a warehouse built from his design (fig. 3), which has a more strongly marked character (the actual building we did not see); and



Fig. 7.—St. Catherine's Home, Manningham (Mr. J. Ledingham).

new warehouse in Commercial-street close to Forster-square (fig. 5), by Mr. Calvert, is very meritorious building, with a good deal of originality of treatment, and yet unmistakably a warehouse. Also in the neighbourhood of Forster-square, but off the Leeds-road, up Currier-street and one or two other short streets, is a whole nest of massive but not very interesting warehouses of classic type, one of which has the angle treated with no less than five tiers of pediments supported by coupled Corinthian columns, one above the other up to the roof line, an arrangement which shows more ambition than architectural invention.

Of other buildings near the central portion of the town we may mention that of the Yorkshire Banking Company at one end of Fyrryl-street, thoroughly well treated as a piece of bank architecture, with strong rusticated piers in the ground story, and an angle entrance with a carved segmental pediment carried by coupled columns, and some good decorative detail around the doorway. Angle entrances, we may observe, seem to be much in favour in Bradford, which is naturally the case where, owing to the irregular street lines, there are so many irregularly shaped lots of building land. We find the angle entrance again in the rich and handsome building of Beckett's Bank (fig. 6), opposite the Midland Hotel. Darley-street is supposed to be one of the best in the town, and the front of the Royal Hotel at the top, by Mr. Ledingham, is a very pleasing bit of free Classic; the buildings ranging down the west side of the street, including the Free Library and Museum and one façade of the Market, are however of rather a commonplace character. But on the east side, at the corner of Darley-street and Kirkgate, is a building, that of the Bradford Banking Company (see lithograph), which is of more than average excellence. The contrast

between the bold plain rusticated ground story, with its cantilever cornice, and the elegant treatment of the order in the upper story, is most effective. The small windows above the main first floor windows, which certainly rather spoil the effect, are we believe an after insertion. We should have mentioned also, near the west end of the Town Hall, the group of new offices flanking Town Hall-street, treated in a free Classic style with gables of varied design, and which are picturesque and original both in general effect and in detail. The opposite side of this street, where there is a good deal of old tumble-down building and blank spaces, is we hope only waiting for opportunity to be treated in a fashion worthy of the commencement already made in this quarter.

Exploration of the more outlying parts of the town is rendered easy by the excellent service of steam tram-cars which run in all directions, and seem to make nothing of the heavy gradients, but the result of such exploration is not very enlivening, except in the direction of Manningham, the principal residential suburb, occupying the highest ground in the neighbourhood. Even in this direction the greater portion of Manningham-lane is bordered by mean houses, only diversified by a Board School and one large new building only half up. At the acute angle, however, where Manor-row and North-parade converge into Manningham-lane, the Yorkshire Penny Bank has secured a splendid site, which their architect, Mr. Ledingham, has turned to excellent account (see lithograph). The building is richly and picturesquely treated, and the semi-circular entrance end, with its three arched doorways, its loggia above, and small cupola crowning the whole, shows as a central object for a long way down Manningham-lane, and is one of the most effective things in Bradford architecture. The best residential roads in Manning-

ham do not show any houses that are either very large or important or very remarkable for architectural interest; there are two or three good ones here and there, but we understand that the wealthiest class of those who are connected with Bradford reside at Harrogate and other places away from the town. Manningham, however, is a clean well-kept residential suburb (the residential portion of it, that is), with the advantage of a high situation and a beautiful view over the country. The most striking thing, however, in the neighbourhood is the enormous mass, or masses, of the Manningham mills, the main building of which, running round three sides of a square, and with its immense chimney which is a landmark for miles round, would be impressive from its mere scale, whatever its treatment in detail. More might have been made of it in an architectural sense, but the large cornice is a good feature and adds to its effect. Among lesser buildings of the neighbourhood we give an illustration, from the architect's drawing, of St. Catherine's Home (fig. 7), a building which however we did not happen to see. Manningham lies north-west from the city. The direct westerly route outwards, along Thornton-road, takes one through one of the most doleful and depressing regions it would be possible to see; dismal waste spaces strewn with all kinds of *débris*, and equally dismal mills of the smaller and cheaper order, apparently deserted and doing nothing, a testimony probably to the struggle through which Bradford commerce went some fifteen years ago, when there was an attempt made to get up a patriotic movement for the purchase and wearing of Bradford stuffs, in order to give an impetus to home manufacture. The same kind of sight meets us in the opposite direction eastward along Bridge-street and Wakefield-road. North-



Fig. 8.—St. Luke's Church (Messrs. T. H. and F. Healey).

ward, along the Ottley road, which climbs up to very high ground, there seems to be the commencement of a new artisan suburb on the slope of the hill, but not much appearance, so far, of any attempt to take full advantage of the fine site offered on the slope of the hill looking towards the town. On the whole, we have never been in any town in which the poorer streets everywhere seemed more dingy, gloomy, and forbidding than those of Bradford. If there is a new building neighbourhood to be utilised and turned to account, it would surely be worth while to make some effort that it should be less dull-looking than most of the existing poorer districts of the town. In the matter of recreation grounds or parks, it must be admitted, Bradford is not badly off, so far as acreage is concerned. There is Lister Park, at Manningham, which rejoices in a splendid situation on the side of a hill, with the view of another hill opposite, and which in summer ought to be an attractive place enough, but there is rather an air of neglect about it. Among its attractions are a sham Gothic entrance-gate, at the lower end, with an indication of a porticulis, and a monument in the middle of the park where the effigies of Sir Titus

Salt, "a great, broad-shouldered, genial Englishman," in a realistic sculptured frock-coat, sits somewhat incongruously under a Gothic canopy of the Eleanor Cross type. There is Peel Park, at the top of the hill up Ottley-road, which we had not time to see; and Bowling Park on the south-east side of the town, large in extent but poverty-stricken in style and laying-out, with the usual winding walks and small bushes for them to wind round. There is Horton Park, nearer the town, to the south, with some pretty corners in it, and outside of it "Horton Avenue," a wide straight road which looks promising—on the map; but alas, when we come to look at it, we find that the "Avenue" is a bare stretch of road with a high wall on one side and a railroad on the other. There is width enough; could not the Corporation make an effort to make an "avenue" of it in something more than name? and (to follow up the subject) can they not make a little attempt at tree planting in some other places? Never did we see a town more bare of trees. In most towns there are a few trees to be found here and there; in London, it has been said (perhaps with exaggeration) that there is not a street without a tree somewhere in it. But Bradford is a

stone wilderness.* Some trees would surely be a possible and charming addition to Tow Hall-square and Forster-square. And what is going to be done with that miserable looking waste space between Horton-road and Morley-street, within view of Tow Hall-square? Surely its present aspect is a discredit to the city.

Bradford is not very strong in churches, and some of the most prominent of them belong to the early period of the Gothic revival, and represent accordingly a phase of architectural taste or architectural opinion which must now be regarded as out of date. It is only fair, however, to endeavour to regard such works from the point of view of its time when they were carried out, and in this sense All Saints', Horton Green (see lithograph), which is one of the largest and most important of the Bradford churches, must be regarded as a good example of its time (about thirty years since). The smaller church of St. Luke's, Manningham, by the same architects (fig. 8) is a better and more refined work in late Gothic style with some modern

* There is a small tree indicated in our sketch of the parish church tower, but we fear it owes something to the draughtsman's imagination.

ouches about it; the tower shown in the drawing is not yet built, there is only a small octagonal bell turret. The interior is a spacious appearance in comparison with its size, and has a generally good effect, only marred by one or two details; the ratheruberant character of the carving on the five piers, and the tinted glass used in the windows. The Congregational church at Manningham, by the same architects (fig. 9) also worth attention, and represents apparently a later phase in revived Gothic.

St. Margaret's Church (fig. 10) appears, in the sketch kindly lent to us by the architects, as a picturesquely grouped exterior; the building itself we did not see. The Roman Catholic Church at Manningham is a rather characteristic quiet building externally, with an octagonal turret near each end; the exterior detail is so very reticent that one is rather taken aback at the sight of the great coarse black marble base-moulds to the nave piers in the interior. But the only church, so far as we saw, which really represents the present feeling in Gothic is Mr. E. P. Warren's St. Clement's (see lithograph) in a quiet out of the way situation at the end of Barkerend-road, leading to a half-formed suburb north-east of the city. This is a most refined building in exterior treatment; not at all showy, but every detail has been cared for; the treatment of the wrought-iron boundary railings, for example, is quite original and characteristic. Why the masonry is finished rough on the south side and polished on the remainder we do not quite understand. The ceiling internally has been painted and decorated by Mr. Frampton and Mr. Anning Bell.

The Board Schools at Bradford are tolerably numerous and are in general well treated architecturally; and it is noticeable that they are in a great variety of styles; there seems to be no accepted Board School type of architecture, as there is in London and in some other cities. We give an illustration of one of them (fig. 11), in pronounced Queen Anne style; there is a large block in Killingham-road in domestic Gothic style, another very large one opposite St. Clement's Church which has the merit of being in no special style, but is a fine and broadly treated building of impressive aspect, though with no more architectural pretension than befits a board school. As a building of somewhat the same class architecturally—one in which suitable and simple treatment is required rather than architectural display, we may notice the illustration of Messrs. Milnes & France's Nurses' Home (fig. 12), which we only know through this illustration, but which appears to be a very good example of the manner in which a certain degree of character may be imparted to a utilitarian building, without departing from simplicity and economy.

It is the want of this quality of "character" which is so often felt in the case of buildings for manufacturing purposes and in manufacturing districts. It was impossible to be at Bradford without running over to see the small town of Saltaire, founded and built mainly by Sir Titus Salt as an appendage to his great mills there, which may be said to be almost a part of Bradford industry. And one leaves it with the feeling that a great opportunity has been lost. The small town is clean and neat to a degree, all (naturally) laid out symmetrically and

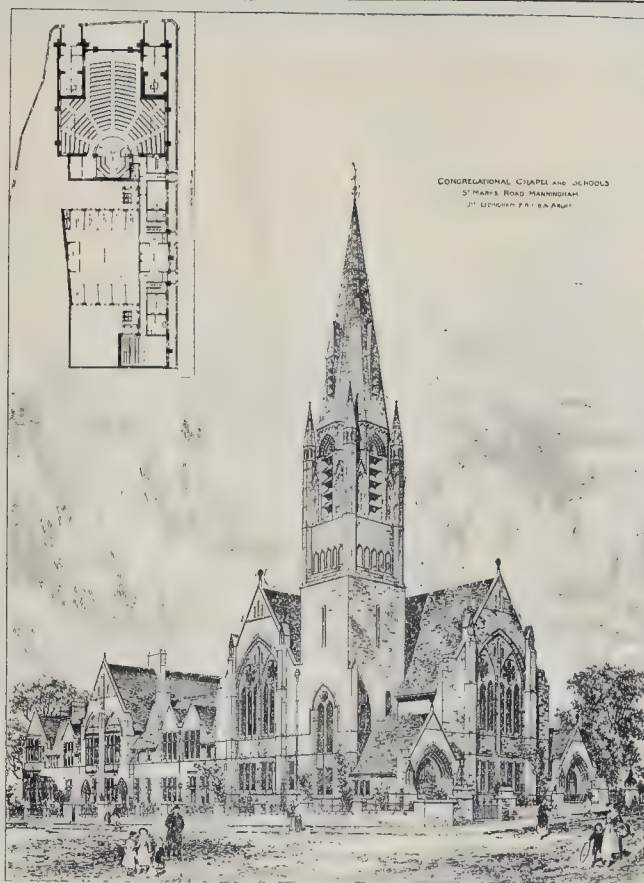


Fig. 9.

with the streets at right angles—to which we have no objection; it would be foolish to lay out a town deliberately for irregular effects. But the rows of small dwelling-houses might have been picturesque and homelike in character, and they are not; they are simply "prim." Some attempt at effect has been made with the schools and the large building opposite to them—which apparently is a kind of town hall—with couchant lions facing each other at each end of the balustrades; there is some originality in the design of the schools; but the whole thing is uninteresting. The Congregational church is a large piece of cold Classic design, with pilasters along the sides and a semicircular colonnaded entrance portico. The huge mill, like that at Manningham, is impressive from its size. But the mistake constantly made in designing these great mills is that of attempting to give them a kind of palatial character, which cannot be carried far enough to be really palatial, or it would be quite out of keeping with the purpose of the building, while at the same time the treatment is deficient in the effect of power and energy which might and ought to be got from such a building. It is rather sad to look, from the high land behind Saltaire, at that glorious undulating landscape with the lights and shadows flying over it, and to find the little town that has been made there so totally at variance with

the romantic feeling belonging to the landscape; a mere piece of commonplace put down amid nature's grandeur.

Halifax too tempts the visitor over, from its proximity to Bradford; and is worth seeing for two reasons; for the splendid position of the town, at the foot of a great hill up which parts of it climb in a picturesque uneven manner, and for the sake of one really fine building, Barry's celebrated town hall, which is worth all its reputation, and in fact looks finer in reality than the impression conveyed by illustrations. The tower, with its often illustrated and often imitated square spire, is at the angle of the building, but Barry took care to have it on the centre of the street line leading up to it, so that it can be thoroughly well seen and make all its effect; and a very fine thing it is; a kind of combination of Classic refinement with Gothic multiplicity of detail. Internally the lower portion of it is occupied by a very gracefully designed staircase with a domed ceiling. The centre of the building is occupied by a roofed *cortile*, with a gallery round it, from which, on each floor, the offices and other rooms open, while the upper portion of the court-room beyond is seen through the glazed openings in one side of the gallery. The whole, though some of the details may not command our sympathy at the present day, is a truly fine and original conception, the



Fig. 12.—St. Margaret's Church (Messrs. H. and E. Marten).



Fig. 11.—Great Horton Board School (Mr. W. J. Morley).

work of a man who was a really original creator in architectural design. It says much for the spirit and ambition of a comparatively small town like Halifax that she could be contented with nothing less than the first architectural mind of his day to design her Town Hall; and it must be admitted that her one great building is superior to anything to be seen in the streets of the greater and more populous neighbour city.*

* This series of illustrated articles was begun in our issue of September 26, 1896. A list of those towns already dealt with, and particulars of future arrangements, will be found on page xviii.

NOTES.

In reply to questions asked on Monday night in the House of Commons as to the measures which had been taken for the greater security of the contents of the South Kensington Museum, the First Commissioner stated that the old buildings known as "the Boilers," the temporary building in the inner quadrangle, and the students' refreshment rooms had been removed. Other works in hand are the fireproofing of the room next to the Raphael Gallery, and the improvement of the galleries on

the west or Exhibition-road (certainly before it was necessary). The private residences of the officials are also to be abolished. The questions seem to have been asked solely with a view to the security of the Art Treasures in the building now existing, but the First Commissioner volunteered the information that a proposal for proceeding at once with permanent buildings would shortly be before Parliament; so that it appears that at last something will be done. It is to be hoped that it will at all events be done in a manner worthy of the nation, and not in the mere cheese-paring spirit of economy.



Fig. 12.—The Royal Victoria Nurses' Home (Messrs. Milnes & France).

It appears, from the model and drawings for Vauxhall Bridge exhibited at the last London County Council meeting, that we are at any rate to escape a repetition of Blackfriars Bridge. The method of construction proposed, of granite facing backed by a great concrete casting, is monumental in appearance, and may prove so in reality. But the details are very bad. There is still the engineer's notion that an immense applied column is the proper feature for the front of the pier, and that the basemould of the main pier should be as large as the whole balustrade of the roadway; while the lamp-columns, placed centrally over the applied columns on the pier face, will give the effect of a series of vertical poles on each side of the bridge. Why is not an architect called in to design the architectural details, as would certainly be done in Paris?

THE Institute of France has formally entered into possession of the Château of Chantilly, and the collections included in what is now to be called the Condé Museum, the contents of which have been inventoried in five volumes, with indications of the arrangement of the various classes of objects according to the intention of the Duc d'Aumale. The Museum contains 557 pictures, without counting the pictures, engravings and drawings which adorn the Château d'Enghien; 30 enamels; 282 miniatures; more than 200 gems and precious stones displayed in glass cases; and in addition to the equestrian statue of Condé, by Paul Dubois, about

50 statues and busts in marble, among which are three by Chapu ("Jeanne Darc," "Pluto," and "Proserpine"), a "Hebe" by Dezeine, the statue of Bossuet by Guillaume, two bas-reliefs by Jean Goujon, and animal sculptures by Gardet and Auguste Cain. Among the 12,600 drawings are 111 original drawings by Nicholas Poussin, and more than 500 by Raffet. Besides these are 5,000 engravings, a collection of 3,685 medals, and a library containing 24,000 printed volumes, 1,493 MSS. and 272 parchments. The Château includes besides more than 500 pieces of furniture and other objects of great value—armour, tapestries, &c. There is also a collection of autographs and historical documents of great interest.

The County Council Works Department.

THE discussion on Tuesday at the County Council on the subject of the Works Department was very unsatisfactory. There is no use whatever in debating this question except on some broad points of principle. To base a discussion on a few estimates and figures is mere waste of time. For the time being the Council are prepared to continue this department though it may be on a somewhat lessened scale. That being the case the work should be now carried on for a sufficiently long period to enable some just conclusion to be arrived at on the work as done under the present changed conditions. Whether that work is successful or not can only be ascertained by a very full consideration of all the particulars relating to it for a substantial period of time. Those members

or the Council who are opposed to the Council doing their own work as contractors damage rather than improve their cause by piece-meal discussions which any practical man knows are of no value.

THE opposition to the proposed new railway to Henley appears to be general and strong. It is obvious that the Company have taken no trouble to ascertain the wishes of the locality through which the line passes. But something more important than the making of this new line is involved in this opposition. The Thames Valley has become a playground for London. It is full of charming building sites, obtaining much of their value from their proximity to the river. It is important that this valley should not be spoiled by railway works, whether embankments or bridges. Any lines which in the future are brought into the Thames Valley should be so planned as not to interfere in any way with its scenery. A railway company regards such a place as one which may be utilised for excursion traffic; it thinks Henley may be made an inland Margate. It is this wrong impression which has to be combated. The Thames Valley should be kept as free from injury as any of the commons in the country which it is now the policy of Parliament to preserve intact. If the present scheme of the Great Western Railway is defeated, as we hope it may be, a great step will be obtained towards the preservation of the scenery and the beauty of the Thames Valley.

Hampstead Heath Protection Society.

THE Society formed about a year ago under this title has issued its first Report. The object of the Society is to assist in the preservation of the Heath in its wild and natural state, and to protest against and oppose "improvements" which are calculated to alter this character; an aim in which we entirely sympathise, though we are inclined to think that in one or two instances the Society have rather injured their own cause by being a little unreasonable in their views or in their manner of stating them. A society to watch over the preservation of Hampstead Heath is an excellent institution, but it will best serve its own ends by interfering as little as possible, and only when there is an evident and palpable mistake to be resisted; otherwise it will create a feeling of opposition. The point which most interests us in the Report is the suggestion that some part of the Golders Hill Estate should be acquired for the public. To those who knew these beautiful grounds when they were in the possession of the late great surgeon who was their last owner, it must seem melancholy to think of such a paradise being destroyed by being turned into a building estate, which seems to be regarded as its probable destination. The house is a good one, however, as added to and modernised by the late owner; and possibly the estate may still be purchased by a private proprietor who will preserve it *in statu quo*.

Greenwich Observatory.

It is expected that the new buildings for Greenwich Observatory will be completed for occupation in the course of next summer. Whilst their erection has been necessary in order that the Astronomer-Royal and his staff may keep abreast with the constant advance of scientific knowledge and research, they will somewhat interfere with the former solitary dignity of the old familiar building. Of that Observatory the first stone was laid on August 10, 1675, by Flamsteed, who lived there until his death in 1719, when he was succeeded by Halley. The eminence chosen by Charles II. for the Observatory was the site of the castle, or tower, built at Greenwich by Humphrey, Duke of Gloucester, who had a grant of the royal demesne from Henry VI. The tower, or "mirefleur," is depicted in Wyngaerde's long view of London, of *circa* 1552.* While the Observatory was being built, Flamsteed, who had previously used the circular turret of the White Tower, London, for his observations, was lodged in the Queen's House, or Palace, at Greenwich. As regards the instruments and their housing, the improvements effected by Sir George Airy (1835-81, when he retired) and his present successor have been so extensive that we believe no instrument is in ordinary use which was there during Pond's time (1811-35). Within the past seven or eight years have been built the porter's lodge, transit room in the courtyard, and octagon tower on the south side of the grounds. The south-east tower dome is replaced with a new one, having iron ribs, and weighing twenty tons. In order to receive the new "Equa-

* A rare print by Hollar, 1637, is headed "Greenwich," and lettered:—

"Behould, by Prospect, with what Art,
A House of Banquet, neare and part,
Faire Greenwich Castle pleasantly
Of Thames and London, how they ly."

torial"—which is 28 ft. long, and has an object-glass 28 in. diameter, constructed by Sir Howard Grubb, of Dublin—the dome was built by Messrs. T. Cooke & Sons, of York, in the unusual form of a bulbous cupola; it contains the telescope in every position save that of a very low altitude. The old 12½ in. "Equatorial" was remounted in the octagonal tower; the new buildings will, we gather, serve for the physical observatory work and for the staff engaged upon "charting" the heavens by photography.

Guildford Castle.

WE hear that the Surrey Archaeological Society have chosen Guildford for their headquarters, and will establish their museum—as a county museum—in the Castle, which is to be adapted for its reception. Guildford Castle, standing upon a partly artificial mound, originally commanded a ford across the Wey. Some follow King* in ascribing to it a Saxon origin. The Castle is not cited in Domesday Survey, and it seems that it was erected *circa* 1150. The walls of the keep, 10 ft. thick, have foundations, for 8 or 9 ft., of chalk and flint, the superstructure, rising to about 70 ft., being mostly of chalk-flint and sandstone, with thin bricks disposed in herring-bone fashion and ragstone facing with square angle-quoins. The hall, about 26 ft. square, had three Norman windows, since repaired with brickwork, the other apartments on the first and second floors had similar windows, one a-piece. On the west side, in the middle floor, about 15 ft. from the ground, was the original entrance (gained by an external staircase) beneath an arch pointed without and circular within—its mouldings being Late Norman. The round staircase was in the north-west angle. As at Rochester, and in the White Tower of London, there are galleries in the upper walls; in the south-west angle of the second floor is a J-shaped vaulted chamber made in the walls, known as the Oratory, having a Norman arcade along all its south side. The keep measures 45 ft. 6 in. by 47 ft. Matthew Paris relates that Louis the Dauphin captured the Castle, on June 9, 1216, when invited to England by the barons. In 27 Edward I. the Castle, together with the town and park, valued at 134. 6s. 8d. per annum, was assigned, with Banstead and Kingston, in dower to Queen Margaret, but eight years later it was taken for a gaol, and so served to the close of Henry VII.'s reign. By letters patent dated April 27, 1612, James I. granted to Francis Carter, mayor, the site and appurtenances covering 5 a. 3 r. 10 p. John, grandson of Francis, Carter, rebuilt the outer gate, on the west side, leading into Quarry-street. Having then passed to the Tempest and Matchwick families, the property was sold, 1810, to the Duke of Norfolk, whose successor Bernard, twelfth Duke, sold it to Lord Grantley. Twelve or thirteen years ago the Corporation purchased the buildings, and they have since converted the grounds and foss into a public garden.

St. Bartholomew's, Moor-lane.

THE Ecclesiastical Commissioners have framed a scheme for uniting the benefice of this church with that of St. Giles's, Cripplegate,

* See his "Monimenta Antiqua," Vol. III., with views and drawings of details; and his "Sequel" thereto.

† For a plan of this floor, and drawing of the Oratory, see Brayley and Britton's "Surrey." 1841.

and for selling the site and materials of St. Bartholomew's. The church was built by Professor C. R. Cockerell, R.A., in place of St. Bartholomew's-by-the-Exchange, pulled down in 1841 for a widening of the roadway opposite Tite's Royal Exchange. Most of the materials were sold on January 4, 1841, for 484*l.*, but the organ (by Bridge), pulpit, and woodwork were reserved for the new church, in which Cockerell reproduced the old tower with its curious finials in the shape of arches or windows. The original church, rebuilt in 1438 by Nicholas Yeo, sheriff, and Thomas Pike, alderman, stood where is now the Sun Fire Office (also by Cockerell, see our illustration of July 11, 1896), for which its south wall, and the chapel built by Sir William Capel, Lord Mayor 1503-4, were retained. Damaged * by the Great Fire, it was repaired by Wren, who reinstated the walls and tower, adding to the latter the singular feature already noticed. Sir William Capel was buried in the chapel he had erected, and beneath the altar was buried, 1568, Miles Coverdale, Bishop of Exeter, whose remains were removed, on October 4, 1840, to St. Magnus, London Bridge, whereof he was rector in 1563-6. St. Bartholomew's district was taken out of St. Giles's in 1851, when its population (now about 250) exceeded 4,000; the decrease is owing to the large amount of land taken for railways, and the extensive building of warehouses. The St. Giles's population has similarly decreased from 13,500 in 1861 to 1,137 in 1896.

The Chasseriau Frescos.

THE removal of the frescos by Chasseriau from the walls of the Cour des Comptes buildings at Paris has been successfully effected after only about twenty-four days' work, one painting only having had to be sacrificed. The various panels, which occupied a total area of about sixty square metres, have been sawn off and transported to a special atelier where the delicate operation is to be performed of removing the actual painted surface from the plaster and transferring it to a canvas backing.

THE ITALIAN RENAISSANCE.†

BY PROFESSOR AITCHISON, R.A.

ALL phases of architecture that the world has known are interesting and useful to architects and are also worthy of the attention of all; for each phase portrays the tastes and tendencies of the time, and tells us the knowledge and imagination of the architect and the skill of the various workmen; but I think I may say without fear of contradiction, that the Italian Renaissance was the most marvellous phase and in some respects the least comprehensible. It has already lasted nearly 500 years, and in spite of the modern conception of architecture it may be said to still hold the first place, except for ecclesiastical structures, in that language of tolerance of architecture that still survives. We are a long way off the days of that witty Ambassador, Sir Henry Wotton, but a still greater gulf separates us from the time when a distinguished diplomatist could say, without fear of ridicule, that "Architecture can van no commendation, where there are noble men or noble minds."

The upheaval of the human mind, at the Renaissance, at first mainly stimulated literature and the ritual fine arts, but it afterwards turned men's minds towards the investigation of the laws of nature. The application of these laws to the material needs of man has gradually

* Not destroyed, as is commonly stated: see Mr. E. Freshfield's edition, 1895, of the parish account books.

† Being the third Royal Academy lecture on Architecture this Session. Delivered on Monday afternoon February 7.

weaned society from the rough instruction given them, and the spiritual improvement engendered by the study of the visual fine arts, and turned the desires of society to that which has endowed them with wealth and power, and accustomed them to ugliness; consequently the fine arts languish.

It is surprising that we have no account of any method of training architects in Italy before the Renaissance, for, as far as I know, any clever man who had learned to paint or to model was considered to make as good an architect as any other. Frederic II. is said to have made Nicola Pisano (1206-1272) his architect when he was fifteen, and Nicola is believed to have designed the Castle Capuano and the Castel del Ovo at Naples; Giotto (1276-1337) did something to the Cathedral and built the Bell Tower at Florence, though he was brought up as a painter. Filippo Brunellesco (1377-1444) was brought up as a goldsmith and became a sculptor, but being a man of extraordinary genius, and from studying architecture from Roman remains, he became to a certain extent an able architect, and, as every one knows, he put the drum and dome on the Cathedral at Florence. What I meant by Renaissance architecture being marvelous was that none of the early architects were brought up to architecture or knew anything about it; they were literary men, goldsmiths, painters, and sculptors, and had no knowledge of what architecture meant as a constructive art. The Italians of the Renaissance, mostly coming from Florence and the small republics of the Val d'Arno, were men of acute minds, of extreme energy, of splendid make and vigorous constitution, of untiring industry, and overflowing with enthusiasm; most of them had learnt to be handy and delicate with their fingers while learning the goldsmith's art, almost all could draw and model, and most of the early ones were sculptors of repute, and the rest were painters of note. All of them, I believe, were zealous students of Roman antiquities, so I think it was only to be expected that revived Roman architecture should take more exquisite forms than it had under the Romans. The codex of Vitruvius was rediscovered in 1414, and was immediately copied and circulated, and is supposed to have been printed between 1480 and 1492. Vitruvius's book was looked upon by the Renaissance architects as a book of recipes for reproducing Roman architecture, and we read in Panormita (Beccatelli) that Alfonso of Aragon determined to use no architect, but only the book of Vitruvius, for rebuilding Il Castel Nuovo, at Naples, between 1442 and 1458. Michelangelo is said to have had the same views when he built the staircase to the Laurentian Library at Florence.

The Renaissance architects, however, got the ancient idea of symmetry from Vitruvius, i.e., the making each part of the building some ratio of the whole. They were, antecedently, votaries of the beautiful, and desired beauty, dignity, or exquisiteness in their buildings.

I now give you the Florentine Renaissance. Filippo, the son of Ser Brunellesco de Lippo Lapi, a notary, was born at Florence in 1377, and died 1446. He was apprenticed to a goldsmith, and became an expert jeweller, and besides making inventions in mechanics became an excellent sculptor, having surpassed Donatello, but seeing himself beaten in this art by the divine Ghiberti, he turned his attention to architecture; for he saw that as Florence was getting rich the cathedral would eventually be domed; so he persuaded his friend Donatello to go with him to Rome and study the antique, and when he had exhausted his money lived there by his craft of jeweller, and was enabled to pursue his studies of the antique. What we know of him we mostly get from Vasari, but whether he was really the precursor of those crowds of students who went to Rome to study Roman antiquities, and whose sketches are to be found in every great library, future antiquarians will have to determine. He, like Anthemius of Tralles, who built the great Byzantine cathedral of St. Sophia, was full of all sorts of ingenious mechanical devices. It is curious that although his building of the dome of the cathedral at Florence without centering created so great a sensation, that no contemporary has recorded the particular devices he used, nor has any one since; though Nelli gives a sketch of the scaffolding; and though Vasari records that before he was entrusted with the dome he vaulted several smaller spaces without centering, does he give us the least hint of how it was done. In this

lecture, however, I am rather tracing the progressive steps in the revival of Roman architecture than seeking to elucidate Brunellesco's feats in construction.

The Pitti Palace is one of his great works, 665 ft. long, including the side porticos, with an extreme depth of 183 ft., and 124 ft. high to the top of the crowning balustrade. He is believed to have only carried up this palace to the top of the first-floor windows. Nothing shows better that truth in architecture, "that nothing comes from nothing," for its general appearance suggests the old Tuscan mediæval palaces, more resembling castles or prisons than places for admiration and enjoyment; very necessary when public riots and private feuds were so rife, and when every palace was so liable to be attacked that they were mostly built by friends in pairs on opposite sides of the street, so that protected drawbridges could be lowered or drawn across the street from which missiles could be showered on the attacking forces below: where the ground-floor windows were small, high up, and closely grated to prevent a horseman from thrusting his enemy through with his lance, or from shooting one of the occupants with his cross-bow bolt.

The whole front of the Pitti Palace is deeply rusticated, and the openings are arched with Tuscan arches—that is, with half-round arches, whose arched stones increased in length from the springing upwards, making a pointed arch at the top. Each floor has a balustrade whose balusters are small, fluted, Ionic columns. On the ground floor most of the arches are filled in and formed into windows with dressings and triangular pedimental heads supported by trusses with an architrave set behind the deep sills, which are supported by cantilevers resting on a deep base, with lions' heads between them. The sills are about 11 ft. above the footway. Probably the upper windows were intended to be similar, but are now partly built up. This palace and some of San Michelis work probably formed the models for Newgate. Brunellesco was constantly employed, being sculptor, architect, engineer, and mechanic. We have amongst his other works the Chapel of the Pazzi, in the cloister of Sta. Croce, at Florence. The front of this consists of a hexastyle Corinthian portico with unfluted shafts. The columns are about 9½ diameters high, and 3½ diameters apart in the clear, except in the centre, which is about 7½ diameters in the clear, and is spanned by a semicircular arch. Above the entablature are coupled Corinthian pilasters, the space between the pilasters being filled with a large marble panel subdivided into four. These pilasters carry an entablature about one-eighth of the whole height of the front, but in the brilliant sunlight the pilasters and panelling are scarcely noticed. The roof is carried by posts to clear the little dome in the porch. The chapel, exclusive of the portico, is externally square; the nave, if I may so call it, is oblong, a sacristy being formed in each angle of the square so as to leave a deep recess for the altar, and to abut the vaults of the nave; a flat dome on pendentives as wide as the nave is in the middle of the vault, and a smaller dome over the altar. The internal architectural adornment consists of fluted Corinthian pilasters supporting an entablature whose frieze is enriched with pateræ. At the ends there are two whole pilasters which divide the space into four parts, two being given to the central opening, which is spanned by an arch over the entablature, and the end spaces have square recesses arched over with round-headed arches with archivolts, and circles above also arched. This front of the Pazzi Chapel appears to be original, and the breadth and simplicity of the front in bright sunshine makes it a notable example.

You can easily understand the popularity of the new fashion, introduced as it was by the great constructive architect of the day, whose scheme for doming the cathedral had surpassed those of all the native and foreign architects, and who had carried out the work successfully, nothing remaining to be done after his death but the lantern. As the proverb says, "The human mind is greedy of novelty," and this novel architecture not only introduced a simpler, larger, and more graceful style than Gothic, but reminded every scholar of the former greatness of the Roman Empire.

The second founder of the Florentine Renaissance was Leon Batista Alberti, of the noble family of that name at Florence. He was born at Venice in 1404 and was carefully taught and trained. He had all

the characteristics of the foremost men of the fifteenth century, brilliant capacities, and invention and untiring diligence; as an instance of the last he is said never to have wasted an hour in his life. His vigour and dexterity were so extraordinary that it is said that he could, standing, jump over a man upright, pierce the strongest armour with his arrows, and fling a coin to touch the highest point of a church vault, while the wildest horses trembled under him. His insight into every branch of knowledge seemed intuitive. At twenty he wrote the "Comedy of Philodoxius," which the Aldi Manutii, the great scholars, published in 1588 as an antique Latin play. He wrote poetry, and was one of the early writers of pure Italian prose. He composed music, painted, and modelled, was a mathematician, engineer, mechanician, and natural philosopher, and is said to have anticipated modern discoveries in optics. He studied law, humanism, and theology, and became a canon of the Cathedral of Florence, and wrote books on all sorts of subjects, and was so skilled in physiognomy and divining that he almost earned the reputation of being a wizard.

How he learnt architecture we do not know; but he became a famous architect. He is mostly grouped with his contemporary, Lionardo da Vinci, on account of their both possessing such brilliant abilities in all directions. Few modern men are so brilliantly equipped by nature, if we except our lamented President, the late Lord Leighton.

Every architectural student knows of Alberti's books on architecture, painting, and sculpture. His fame as an architect now mostly rests on the Rucellai Palace at Florence, the Church of St. Andrew at Mantua, and his conversion of St. Francisco, at Rimini, into a temple to Isotta, for Pandolfo Malatesta.

He treated the front of the Rucellai Palace after the fashion of the Colosseum, only using pilasters instead of columns, and putting pedestals under the ground floor pilasters, the mouldings of which are carried through as a podium. The lowest order is Doric, with the echinus carved into eggs and tongues and the necking fluted. The capitals of the pilasters on the first floor are what we should now call Renaissance, but doubtless copied from a Roman example; on the second or top floor the capitals are of that sort of rough Corinthian whose leaves are not raffled. Each of the lower orders has its entablature, but the top entablature is formed into a cantilever cornice about one-seventeenth of the whole height of the Palace. The front does not appear to have been finished, as there are some of the arch stones of other windows on the two upper floors; possibly one more bay only was intended to make the front symmetrical. It is now divided into seven equal bays, with the exception of where the two doorways occur. These are about one-ninth wider than the other spaces, and the cornices of the doors project over the pilasters. The windows of the two upper floors are round-headed, and the archivolts are parallel, and not pointed as in Brunellesco's work.

The ground floor has small square windows in each intercolumniation, the bottom of whose architrave is level with the cornice of the doorcases. The whole front between the pilasters is rusticated in irregular heights. The windows of the two upper floors are formed into doublets by a centre column with two half ones at the sides supporting a lintel; above this each doublet is arched with a semicircle, while in the central spandrel is a circular opening. Between the pedestals of the lower pilasters the filling in is treated in imitation of opus reticulatum. I have lingered over this phase because it made the second stage in the architectural Renaissance of Italy.

Another work of Alberti's is the domed church of St. Andrew at Mantua, although I believe he did not turn the dome; but the work which has mainly conducted to his fame as a practising architect is the conversion of the Church of St. Francis, at Rimini, into a temple to Isotta, commonly called the Temple of Malatesta.

This work is said to have been begun by Alberti in 1447 and finished in 1450, and that he cased the old church. There is a triumphal arch to Augustus at Rimini from which he is supposed to have got some of his ideas and details of the front.

The front of this Malatesta temple is unfinished above the line of the cornice. It consists of four fluted columns with nondescript Ionic capitals, the neck having a row of

leaves above the astragal. These columns support an entablature which is carried right across the church and projects over each column; in the centre compartment is an arch, the upper part of whose archivolt almost touches the soffit of the architrave of the entablature, and in each of the two side compartments are narrower and lower arches all having circular panels surrounded by wreaths in the spandrels; below the lunette of the central arch is a wide doorcase surmounted with a triangular pediment.

As it now exists, the sides of the front gable finish below the tiles, and the unfinished central part above the gable is carried up by wide piers, with a fluted pilaster in the middle of each, and on the right hand side looking at the pier there is an impost and a vousoir of an arch that points to an arched opening being intended.

The entablature is carried along the flank but has no columns beneath it. The flank is a plain wall pierced by an arcade of seven openings, the arches springing from rectangular piers with boldly moulded capitals, but without bases, standing on the continuation of the podium on which the columns of the front rest. The cap of this podium is moulded and carved, and below this, the podium goes sheer down to the ground. The only other ornament on the flank are six round panels, surrounded by a garland as in the front, the lower half of each panel being in the spandrel. In each recess of the arcade is a sarcophagus to the deceased humanists.

This half-mad tyrant and monster, Sigismund Pandolfo Malatesta, was strongly imbued with the passion for learning which distinguished the age, for he had the body of Gemistos Plethon (1355-1450) exhumed and brought from Mista in the Morea, and buried in his temple, in recognition of Plethon's services in teaching Greek to the Italians.

This flank is a true revival of Roman architecture—grand, simple, and severe.

The inside of the church is very striking, in spite of the old timbered roof. It is said that Alberti meant to dome it. Some of the enclosures to the chapels seem like fourteenth century work, and the chapels have Gothic vaulting. The pointed arches to the chapels in the nave are supported by piers or pilasters. One of each alternate pair are apparently made up of a pile of carved cassones with their bases and cappings four in height, with groups of figures on the flat parts; the other pairs consist of little temples with pilasters and an entablature, mostly with a single figure between the pilasters. These little temples are piled three in height. Above these the top of a pilaster issues, fluted below the necking and having a composite capital; some of these piers or pilasters in the Malatesta Chapel are supported on two elephants, the elephant being the crest of Malatesta. This chapel with the elephants is said to have been carved by Simone (said to be the brother of Donatello) who worked with Filarete on the bronze doors of St. Peter's. Bernardo Cuiifagni is also said to have sculptured the portrait of Sigismund Malatesta from life on his tomb in this chapel. Where the space between these piers or pilasters is narrow one fluted composite pilaster is inserted; where the space is wide there are two similar pilasters which support the ends of the continuous impost of the nave arches, the remaining portion being supported by three cantilevers with festoons between them and with shields hanging on them, while the impost breaks round the pilasters and the cantilevers. Above these breaks are five narrow fluted composite pilasters on elongated pedestals, supporting a string above the archivolt of the nave arches; in front of these pedestals stand figures of children with shields. The spandrels of the nave arches have circular panels formed by a garland, and contain shields; the rest of the spandrel is filled with bold and vigorous foliage. On the flat part of the archivolt is engraved in Latin the legend, "Sigismund Pandolfo Malatesta erected this in the year of grace 1450." Some of the enclosures to the chapels are, as I said, composed of small baseless colonnettes, supporting trefoiled arches and a capping, all of the style of the fourteenth century, and the others have larger and higher colonnettes, whose capitals support figures of children, and some way below the capitals of the colonnettes are pierced Renaissance panels.

There is no pretence of architecture in this interior as a structural art, but architectural features are used in a very original way as a

scenic decoration. The whole interior may be looked on as a museum of the sculpture and architectural forms of the revival.

It may be well here to say something of columns and pilasters, as Bramante, who makes the third step in the Renaissance, invented a new departure in the matter of pilasters. He used them on the same front, wide apart and narrow to make rhythmical vertical divisions. The Greeks, as you know, made the ends of walls into pilasters, that is they gave them a capital and base. This was an æsthetic invention, and in the golden age of Greek architecture the capital of the pilaster had no similitude to the capital of the column. The columns were the necessary supports of the lintel which, in the first instance, was confined to the front. When the temple was surrounded with a verandah, its side lintels wanted supports, for the roof spanned from one side lintel of the verandah to the other.

The most cultivated Romans felt the artistic excellence of Greek architecture and wanted to have as good architecture in Rome, particularly as they had practically subjugated Greece, under the pretence of giving it liberty; but having small artistic gifts, they thought this result could be achieved by putting the admired Greek verandah into their buildings. The necessity of cheapness at certain times made them use pilasters on the wall instead of a verandah of columns, and they did not see why these pilasters, because they were square and flat, should not be treated like round columns. Walls and windows were a necessity, columns and entablatures were art, and important buildings could not be tolerated without art, so you had what you so often see in the streets of London, a temple of columns and entablature filled in between with walls and windows for dwelling in, or for other useful purposes. Columns, as a rule, were of no use to the Romans except occasionally to form shelters in the shape of porticos; but when groined vaulting was used the Romans saw that columns might be usefully employed to carry the groin points. In large buildings like the baths, where the internal halls wanted light, large windows had to be used. The long entablatures, however, kept out the light when the space between the columns was all window, so they omitted them; but feeling that art was necessary, though they cut away the entablature for light, they still kept a piece of entablature over each column to show what they would have done, had not necessity compelled them to abolish the entablature. It was not till the days of Diocletian that they got rid of this superfluous and rather dangerous stuff. It is superfluous to say that a column used in a building as an ornament, or for any other purpose but to support weight, is ridiculous.

It seems most unfortunate that at the time of the Renaissance, the Italians should have had no architects, and that such extraordinarily able men should not even have comprehended that architecture was a structural art—that such an artistic race should have cast themselves blindfold at the feet of the Romans whom they so greatly surpassed in artistic skill and invention; but we must take things as we find them in this world, and be grateful for any good we can find.

From the middle of the twelfth century till the end of the sixteenth century the art of construction had made giant strides in the West; in fact, if we except the strides made by the use of iron in this century, it had made the greatest advance ever known, and yet all this was wilfully thrown away by men of the rarest powers and the greatest versatility. You see these literary men, goldsmiths, sculptors, painters, and carvers and gilders, becoming first-rate civil and military engineers, and yet these very same men, regardless of what had been done, were trying to continue architecture in the path it was pursuing a thousand years before; they not only signally failed, but have, through the glamour of their personality, prevented it making a single step forward from that day to this. It is for you students to enter again on the right path, and again make architecture a progressive art, and at the same time make it as beautiful as that of the Renaissance by due attention to elegance of proportion and form, to effective mouldings, and to beautiful and appropriate ornamentation.

THE WESTMINSTER IMPROVEMENT SCHEME.—It is reported that Mr. Norman Shaw has accepted the position of architect to the board for promoting the Westminster Improvement Scheme, and that Mr. Lutyens will be associated with him.

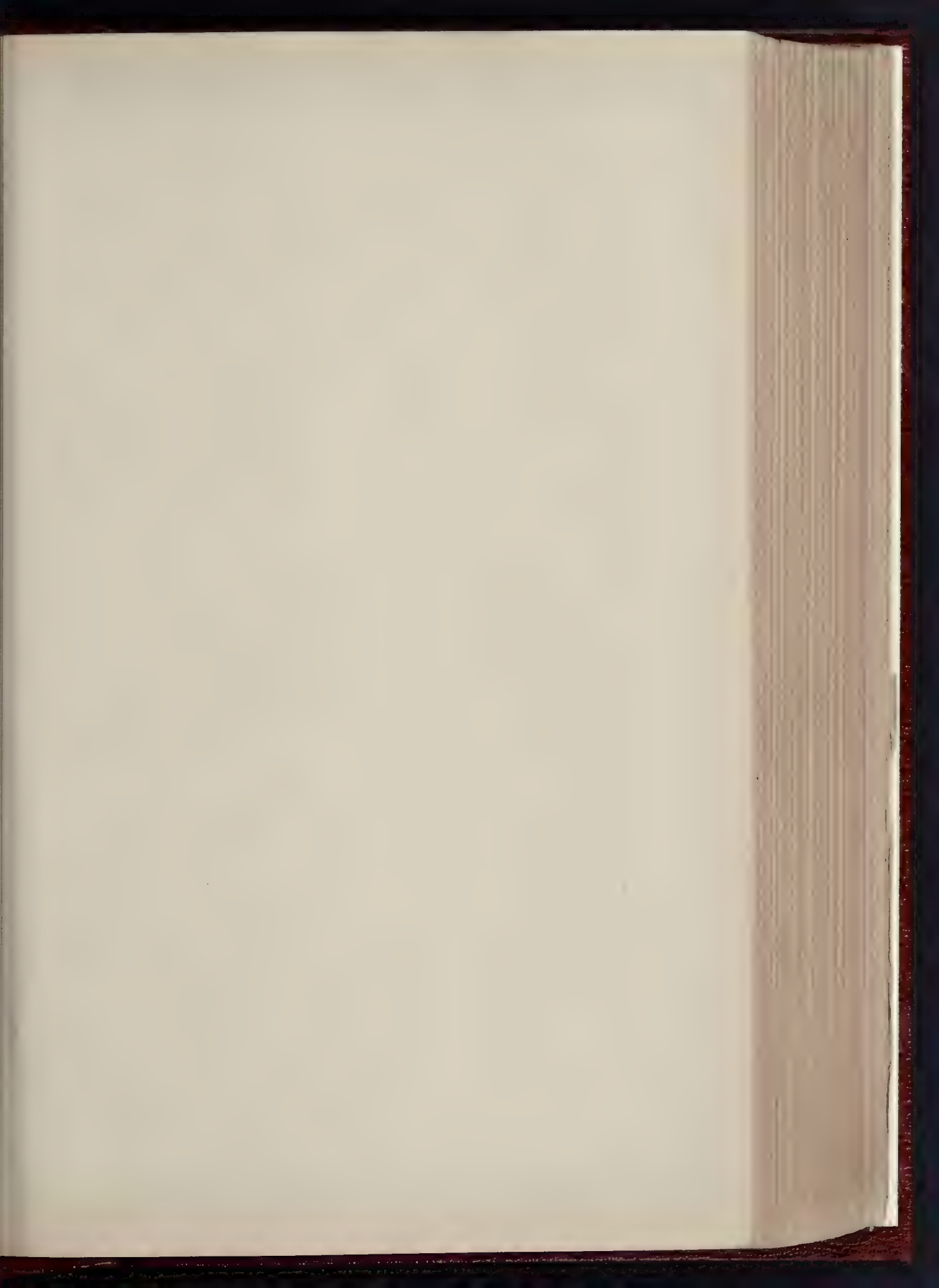
Illustrations.

THE lithograph illustrations in this issue consist entirely of buildings in Bradford, and are nearly all referred to in our leading article.

They consist of, on the first sheet, Bradford Town Hall and a view in Market-street; second sheet, the Yorkshire Penny Bank, St. George's Hall, and the offices of the Bradford Banking Company; third sheet, the Technical College, the Market, and the London and Midland Bank; fourth sheet, the Prudential Assurance Company's Offices, the Post Office, the Mechanics' Institute, and the churches of St. John the Evangelist, All Saints, and St. Clement.

ARTS AND CRAFTS EXHIBITION, LIVERPOOL.

THE spring exhibition of architectural drawings and arts and crafts, opened on Saturday last at Liverpool, shows a distinct advance on those of previous years. A large room is devoted to architecture, about four times the size of that similarly appropriated at Burlington House, and an opportunity is thus afforded architects of exhibiting their work on a scale and in a manner which the smallness of the room at the Academy renders impossible. Although there is much that is interesting amongst the nearly two hundred drawings, &c., hung, it cannot be said that the architects have availed themselves of the chance offered as much as they might have done. Many excellent designs by Messrs. Norman Shaw, Brydon, Reg. Blomfield, Mountford, Gerald Horsley, Prior, Skipworth, Temple Moore, Gotch, Voysey, and others, are included, but these are mostly represented by the "framed perspective" which we are so accustomed to see on the Academy walls, and of which we are so tired. There are many photographs of buildings, however, accompanied by plans, which is a far more satisfactory way of representing one's work. Two of the most complete exhibits are by Mr. A. M. Paterson, of Glasgow, and Mr. F. W. Bedford, of Leeds, who send sets of working-drawings accompanied by photographs; but the buildings so represented, although interesting in design, are unimportant. Mr. Mountford sends a "light and air" model of his Museum extension and new Technical School, Liverpool, which when completed should form a good termination to a fine range of buildings. In the large room devoted to applied art there is much that is good and little that is bad. The "trade" advertisements, which in former years proved the principal feature, although not quite conspicuous by their absence, are few and unimportant. One corner of the room is, it is true, given up to a portion of a dining room "in the Renaissance style," and this it is unnecessary to describe as everybody knows well the kind of thing. The most perfect little exhibit is by Mr. R. L. B. Rathbone, who sends two wall cases full of the most fascinating little brass and copper cabinet fittings and door furniture, delightful in colour, the result of natural oxidation, and simple and never forced in design. Mr. Rathbone also sends some copper candlesticks, designed and executed by himself, which prove what can be done by a competent workman and artist without overstepping the limitations imposed by the material used. Mr. Anning Bell, amongst other things, has two coloured plaster reliefs which are charming in design, although it is to be doubted if the colour applied has really been an improvement. One cannot help feeling that much of the effect is lost through many colours being introduced, and that simple white and gold with but a touch of colour here and there as high lights would be more effective. He also sends some large cartoons for stained glass, which are carefully finished uncoloured drawings; but they are only means to an end, and it is as they might whether carefully prepared cartoons such as these should be made at all. Much of the freshness and expression shown in these must, if copied by another hand, be lost in the work itself. Really satisfactory work in this branch will not be universally obtainable until all artists paint the glass, as some happily do, themselves. A better way probably of showing a design for a window is Mr. C. W. Whall's coloured sketch, which shows through a brown paper mount representing the mullions and lines of the tracery. Doubtless a better way still is a method,





THE YORKSHIRE PENNY BANK (MR J LEDINGHAM)

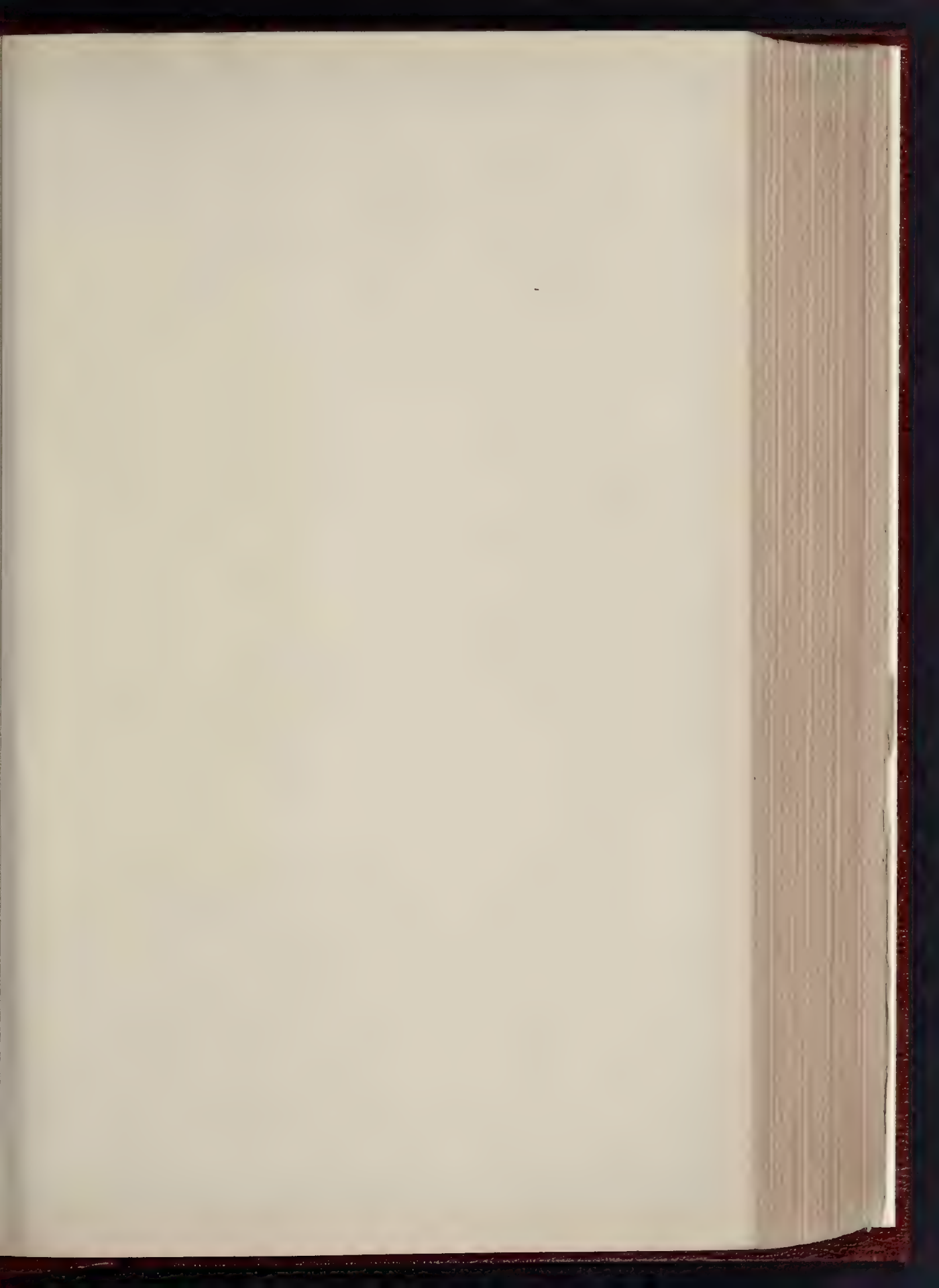
BRADFORD ARCHITECTURE



ST. GEORGE'S HALL.—(MESSRS. LOCKWOOD & MAWSON.)



THE BRADFORD BANKING COMPANY.—(MESSRS. ANDREWS & DELAUNAY.)





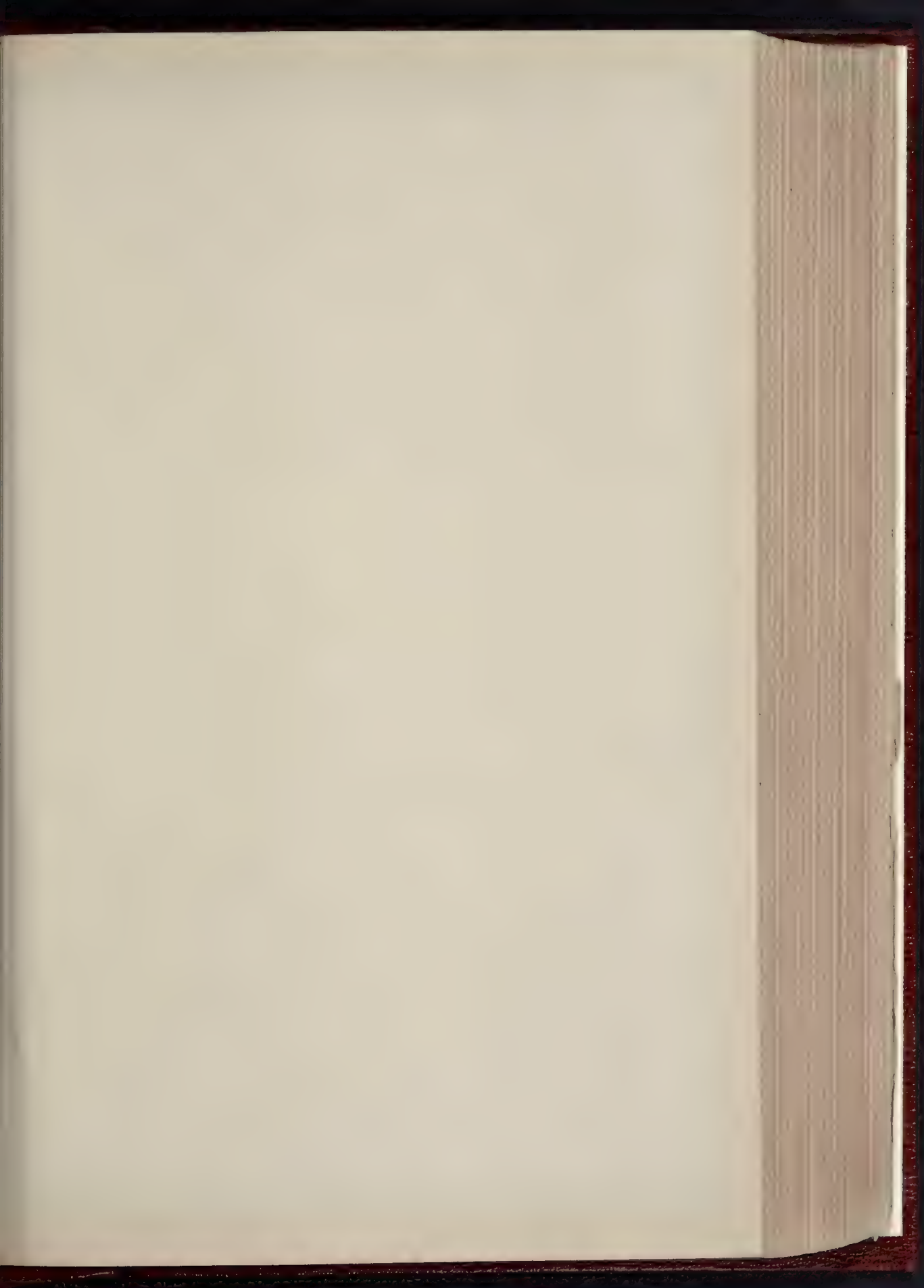
THE TECHNICAL COLLEGE.—(MR. T. C. HOPE.)



THE MARKET.—(MESSRS. LOCKWOOD & MAWSON.)



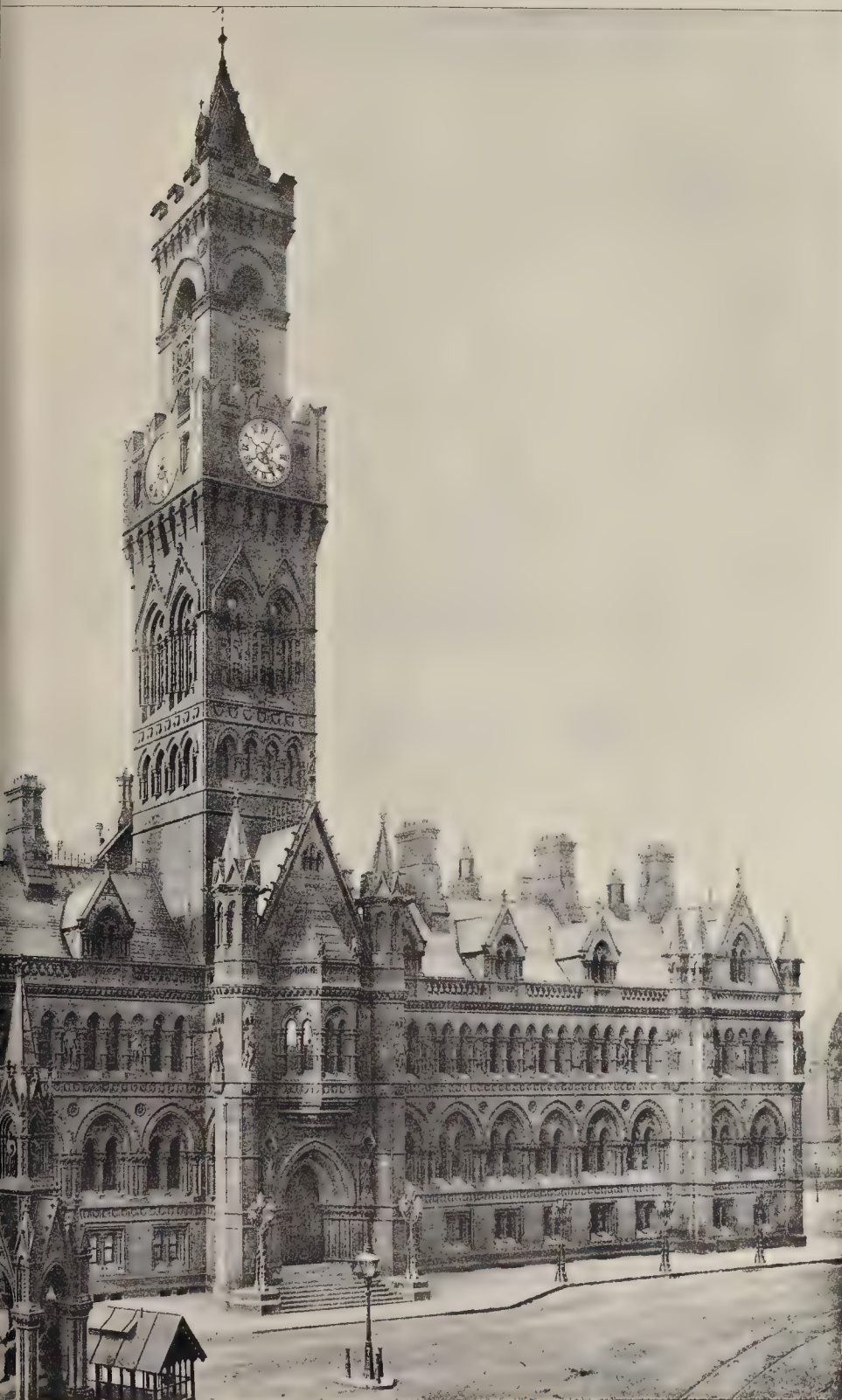
LONDON AND MIDLAND BANK—(MR J. LEDINGHAM.)



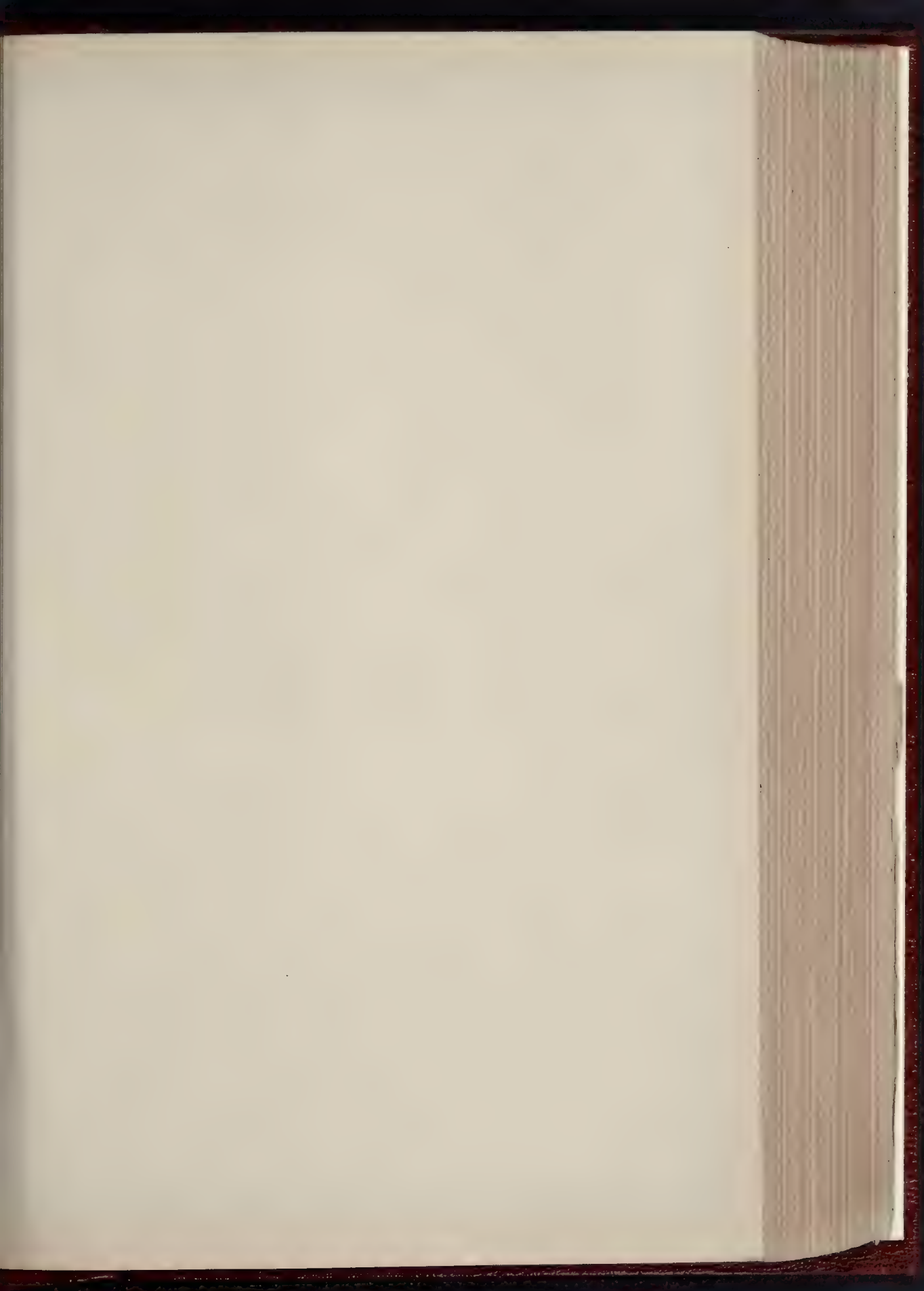


MARKET STREET, SHOWING THE EXCHANGE.





HALL -(MESSRS LOCKWOOD & MAWSON)





ST. JOHN THE EVANGELIST.—(MESSRS. T. H. & F. HEALEY)



THE PRUDENTIAL ASSURANCE BUILDING



THE POST OFFICE



THE MECHANICS' INSTITUTE



(MESSRS. A. WATERHOUSE & SON.)



ALL SAINTS' CHURCH. (MESSRS. T. H. & F. HEALEY.)



(MESSRS. ANDREWS & PEPPER.)



ST. CLEMENT'S CHURCH.—(MR. E. P. WARREN.)

194 P. 10. SPHAGNE A. C. 1. A. S. LAST HARDING STREET KETTER LANE. E. C.

practised we believe by Mr. Whall, of showing sketch in bits of coloured glass, but here is a difficulty in placing it where can be properly seen. Mr. Nelson awson sends a grate and fireirons, which, original in design and excellent as they're in many ways, are wonderfully impractical in some respects. The size and weight of the fireirons, for instance, would render them most useless, and the gilding applied to the grate itself, which adds so much to its appearance in an exhibition, would rapidly become lack when in use. Mr. Longden's exhibit, though rather dull, is more practical, and his grates with enamelled tops—designed by Mr. Ethaby, we believe, although no mention is made of this in the catalogue—are effective. Here is a very numerous exhibit of various vases, panels, &c., by the Della Robbia Co., Birkenhead, but none can be said to be quite satisfactory. Some fail in colour, some in design, and the least ambitious are the best. Here is a very fine set of plaster models, "The Children in the Garden of Joy," designed and modelled by Mr. Stirling Lee, and intended to be carved in wood for the staircase of a London house; but it would have added greatly to their interest if some explanatory plan or drawings had been sent with them showing their sequence and positions and showing their architectural setting. Mr. Krall sends a case full of ecclesiastical metal work, of which the crystal and silver examples are the most telling. But why does Mr. Krall omit all mention of other names than his own? Some very good painted and glazed tiles, designed by Mr. Lewis F. Day, are shown, and some excellent examples of silk damask, manufactured by the English Silk Weaving Company, and designed by various artists, are exhibited by Mr. Robert Christie. An embroidered quilt, designed by the late William Morris, and executed by Miss May Morris, is unfortunately, stored away in a corner, where it may not receive the attention it deserves. An exhibition of this kind would be complete without Mr. Voysey's wall papers and hangings, and many of these, especially the latter, are charming in colour and design. Miss Margaret Hussey's carved and gilded names are worthy of mention, and so is Mr. Robert Hilton's copper panel with its enamelled figure. Altogether the show of applied art is excellent, and it would be difficult to see an equally good one in many provincial towns. Another large room is devoted to the work of the students of the School of Architecture and Applied Art and other schools in Liverpool. Much of the work of the school named is good, and shows that it has kept in view the objects for which it was founded—that of educating students in architecture and in the arts and crafts allied to architecture. Included in its exhibits are designs for houses, churches, &c., and other architectural drawings, many designs for friezes, wall papers, &c., several examples of modelling of panels, &c., a small but excellent collection of wrought-iron work, a few examples of copper work—a branch lately started—and some carved wood panels which are nothing remarkable, although workmanlike. There is a well-arranged collection of photographs in two of the small rooms, and another large room is devoted to representative examples of Indian work, lent by the South Kensington authorities. Last, but not least, is an excellent collection of lithographs by Mr. H. Shannon, of which "The House of Ullia" is especially good.

THE SURVEYORS' INSTITUTION: SURVEYORS AS ARBITRATORS.

An ordinary fortnightly meeting of this Institution was held on the 7th inst. in the temporary premises of the Institution, Savoy-Place, Victoria Embankment, Mr. R. Vigers (ice-President) occupying the chair. The minutes of the last meeting having been read and confirmed, The Chairman called upon Mr. P. E. Piditch to resume the discussion on Mr. A. A. Hudson's paper entitled "Surveyors as Arbitrators," which was read at the last meeting on January 24, abstract of which will be found in our issue of January 29. Mr. Piditch, in supporting the vote of thanks, said that there were a great many cases where arbitration might be suitable, but in the large class of cases where the surveyor had to do with property, the present procedure could hardly be improved. There were two classes:

of disputes under the London Building Act, the first: cases under the party-wall sections, where the procedure was laid down, and where one surveyor was appointed on each side, and another to act as umpire. The other class, which Mr. Hudson had not referred to, were those sent by the Act of 1894 to the Tribunal of Appeal. Most would agree that the best tribunal to settle building cases was where a surveyor, who was also architect, or who had architectural knowledge, was employed. Mr. Hudson had said that where a surveyor was employed as umpire, the costs were frequently as high as if the case had been taken before the High Court. This was the case where a solicitor and one or two counsel were employed to fight out the case, but it was not necessary to fight out every case in this way. One argument against the employment of a surveyor alone was the difficulty of finding one who would decide upon strict legal rules questions of cost. They would probably all admit that the surveyor was much better able to understand technical evidence than a judge, who had not sufficient technical knowledge. The surveyor seemed to him to be able to give a decision on the merits of the whole case, whereas the High Court cases were sometimes necessarily decided, not on the weight of evidence, but on some small point which the judge had been able to understand. He therefore thought a surveyor was the best tribunal in building cases; but all cases could not be taken before a surveyor, as in many a legal point was the whole question, and he thought the surveyor was out of place in settling cases where it was a question of legal liability. Mr. Hudson had suggested that a tribunal should be formed to which certain cases might, as a matter of course, be referred. He had referred to the Admiralty Court, but he (the speaker) thought that this court must be expensive, as experts were there apparently trying the case twice over. Possibly Mr. Hudson would agree to an extension of the present system of setting apart a certain judge to try a particular class of case, as in commercial cases, with a reference to a surveyor to report on the facts only. In aid of this a list of surveyors competent to act in particular kinds of cases might be kept in the Court. He thought this might be done, but he did not think they would get the Government to set up a brand new tribunal.

Mr. T. M. Rickman said that the first thing necessary was that the building should be seen by the person who had to settle the dispute. He thought the court should sit at the building itself, and have before it the matter it had to discuss. In regard to the Institute of Architects, the recommendation of the Institute was that the arbitrator should be a Fellow of the Institute, and not merely a member. The position of an architect where he had had nothing to do with a building, but was called in to arbitrate, was very different from his position where he had been connected with the building by giving orders or otherwise. It must be admitted, he thought, that it was natural for an architect who had had work carried out to have a bias towards the owner; but an outside architect did not have that bias. As to the professional training of men who should be appointed arbitrators, a good deal depended upon a man's early business experience. Men with business experience like quantity surveyors, were naturally preferred by builders, but they must remember that a quantity surveyor not only prepared the quantities, but was also commonly called in to adjust the accounts at the end. He supposed that if an architect were appointed arbitrator between a building owner and a builder, one would be selected who would not be influenced by known feeling for one side or the other. Where an arbitrator was named in a contract, it was not fair for the client to be able to name his architect as final umpire. The arbitrator's name should be mentioned before the contract was made. If one looked at the question of what a technical court would have to do it would be found that such courts must be deputed, among other matters, to settle questions between builders and clients as to work done. The questions that arose as to party or joint walls were much more difficult of settlement in the country than in London, where there is a Building Act. It would probably be of advantage if the right of light in London and party-wall questions could be dealt with by a single mind. The arbitrator should be trained by taking first one side and then the other. If he

worked up from a builder's clerk then he would first take the builder's side, and if he had had a strictly professional training then he would first act for the owner; but he must have practice alternately, and must learn to say the same thing to both sides.

Mr. H. Northcroft said that it was not a question between architects and surveyors which were the more competent to act as arbitrators. That was wholly a question of the strength of character and independence of the man himself. He ventured to point out that Mr. Hudson's paper suggested no interference with professional arbitration as such, but that it drew attention to the crying need of a technical tribunal for building cases. Not more than one-fourth of the disputed building cases came before the Courts, and those were, from the nature of the circumstances, most indifferently dealt with. The technical tribunal would have nothing to do with party-wall disputes: the rules in force under the London Building Act might well apply to the country. The tribunal must consist of at least two members, one legal and one technical, as it was hardly possible that one man could combine in himself the qualifications of both sides, or obtain the necessary training. He should like, if in order, to move a resolution to the following effect:—"That a Committee of the Council be appointed to consider the question of a technical tribunal, and to inquire into the nature of the causes which would be brought before it."

Mr. A. Vernon said that since the Romans there had not been such an honourable Court as our High Court, but he thought that they would all prefer to go before arbitrators, who understood the subject, in the event of a dispute.

Mr. W. H. Strudwick said that when no legal questions were involved the reference of disputed builders' accounts to a surveyor accustomed to act both in the interest of the builder and also of the building owner was the best mode of procedure. He thought the name of the President of the Surveyors' Institution should be substituted for that of the President of the Institute of Architects in the arbitration clause in conditions of contract.

Messrs. C. J. Mann, H. T. Steward, and Arnold Statham having spoken, and the vote of thanks having been put, and carried unanimously,

Mr. Hudson, in the course of his reply, said it had been stated that his was only a scheme, but he was dealing with cases that must go to law, and at present the judge had no power to refer any case to a special arbitrator. They needed some centre to, as it were, deal out these cases. He thought the Surveyors' Institution might well put into the form of contract that the arbitrator should be appointed by the President of that Institution.

The Chairman said that it was now often the case that the name of the President of the Institution was put into the form of contracts. The meeting then terminated.

The annual dinner of the Institution, which was held on Wednesday last week, at the Holborn Restaurant, was attended by upwards of 200 members. Mr. Christopher Oakley, the President, occupied the chair. In the course of the evening, Mr. Wheeler, Q.C., proposed "The Surveyors' Institution," and referred to the steady progress which the Institution had made in recent years. From the numerical standpoint, the Institution now occupied the second place among professional societies, omitting, of course, from this comparison, those ancient corporations, the law societies, and the two branches of the medical profession. They had introduced a system of professional examination of a most practical character, carefully adapted to the requirements of the various branches of the profession, and had actually examined 3,228 candidates in the last sixteen years. Moreover, it had accumulated funds sufficient for the construction of a large building, now in course of erection, in Great George-street, designed by Mr. Waterhouse, R.A., and estimated to cost 30,000.

MISSION CHURCH, HUNSLLET, LEEDS.—A new mission church is being erected at the corner of Low-road and New Pepper-road, Hunsllet. The building has two floors, the upper being intended for use as a mission church, to seat 250 persons, and the lower for Sunday school and other purposes. The dimensions in each case are about 27 ft. by 63 ft. The structure has an apsidal termination to the east. The architect was Mr. J. E. Leak.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Dr. Collins, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Fulham Guardians 2,100*l.* for alterations and additions to the workhouse infirmary; the Wandsworth Guardians 4,200*l.* for drainage works at the St. John's Hill Infirmary; the Paddington Guardians 25,000*l.* for purchasing land upon which to construct more additions to the workhouse; and the London School Board 150,000*l.* for the purchase of sites, erection of new schools, &c.

The Works Department.—The same Committee reported as follows (Paragraph 11):—

"At a recent meeting of the Council our Chairman promised to furnish to the Council a return showing the financial position of all works in course of execution by the Works Department. The manager has prepared and presented to us a return showing the position of all works completed but not reported to the Council under Standing Order No. 189, and of works in progress. We have directed a copy of this return (No. 5), together with an explanatory report by the manager, to be sent to each member of the Council."

The report of the manager referred to in this paragraph is as follows:—

"In presenting to the Finance Committee the appended return of works completed and not measured, and of works in progress, some explanation appears to be necessary, and I therefore, in accordance with the request of the Committee, beg to offer the following remarks:—

Statement No. 1.—Works commenced during the late management, and completed in 1897, but not measured.—It is not yet known what the revised estimates for the two works on this statement will be, but when they are arrived at I shall be able to give full explanations of the causes of the excess which will doubtless appear in the cost of Pimlico river station. It may, however, be said generally that the same reasons for the excess apply in this case as reported by me in the case of Vauxhall (temporary) bridge. In the Battersea river station foundations it will probably be found that the final estimate, and the actual cost, will about balance one another.

Statement No. 2.—Works commenced during the late management, and still in progress.—Dealing first with the artisans' dwellings at Green-street and Gun-street, and at Boundary-street (blocks C, E, and F), I would point out to the Committee that the variations on these works, since their acceptance by the Department, have been so extensive, affecting work of the value of thousands of pounds, that it is quite impossible to offer an opinion as to what may prove to be the final result. One portion of the work not included in the original estimate for Boundary-street, but included in the actual cost, to be transferred to a separate account when the expenditure is complete, amounts to about 1,000*l.* Over two-thirds of this work was executed during the late management. The work in connexion with the Vauxhall temporary bridge approaches was subjected to serious delay due to the alterations to the centre span of the bridge, and the revised estimate of the value of the work under these circumstances will be a matter for the judgment of the Engineer; I am unable, therefore, to express an opinion as to the final result. More than half this work was done before I took control. The first portion of Lewisham sewer, equal to about two-thirds of the whole expenditure, had been executed before my appointment, and I have fortunately been able to arrive at the value of the work executed up to that date. From this it appears that the actual cost at that time exceeded the estimated value of the work done by about 14,800*l.*, and although I anticipate the revised estimate will be somewhat less than the original, from a comparison of the figures it is quite certain that at least there has been no excess over the estimate on the work done since the date referred to, and I am hopeful that in the end it will be found that the excess has been considerably reduced. In justice to the late manager it should be remarked that difficulties were encountered in the first portion of the work which did not occur in the second, but, on the other hand, I found it necessary to reorganise the staff and the entire method of conducting the work, and the result of the change of method was a reduction in the cost of execution of at least 33 per cent. From comparison with prices paid for earlier works of the same nature, I have arrived at the opinion that, had the work been offered to tender, the amount asked would have been upwards of 75,000*l.*, but I further consider that, had the methods been adopted at the commencement of the work which (after very careful and anxious study of the condition in which I found the work on my appointment) have since been adopted, the estimate would not have been exceeded. I can offer no opinion as to what may be the final result, as it will, I think, be necessary to go into the

whole detail of the measurements before any idea can be arrived at as to its estimated value. Nearly 80 per cent. of this work was completed when I took charge. Crossness outfall boiler settings will result in a considerable saving over the estimate, the work being as nearly as possible completed. Almost to per cent. of this work had been executed before my appointment. Crossness outfall extension of pumping arrangements: when this work was taken over by me on my appointment, about 34 per cent. of the expenditure to date had been incurred, but the work was in considerable confusion, and it was found necessary, as at Lewisham sewer, to entirely reorganise the job, and I am happy to say that an excess over the estimate need not now be feared.

Statement No. 3.—Works commenced and completed during new management, but accounts not yet agreed.—On both the works under this head a very fair saving may be looked for. It will be noticed that these are the only two for which I give the approximate revised estimates, the reason being that in the first (Vauxhall temporary bridge alterations) the original estimate has been largely reduced in consequence of modifications in the design; and in the second (Albert and Chelsea embankments repairs to lamps), there has been so little departure from the original intentions that no difficulty in arriving at the probable amount.

Statement No. 4.—Works commenced during new management and still in progress. It is expected that six of these ten works will be completed by the end of this month (February), and that they will, in each case, show a fair saving of cost over the estimate. On one of these, viz., Millbank estate roads and sewers, the saving will be very large owing to certain favourable incidents, which will be fully reported upon on completion of the job. Of the remaining four jobs, the "Central Works"—"Enlarging stores" will show a saving; Boundary-street, Clifton and Molesey buildings is in too early a stage to offer a definite opinion as to the final result, but I have every confidence that the estimate will not be exceeded. In the work of North Woolwich drainage the period of greatest risk has been successfully passed, and I expect the work will be carried out well within the estimate. Peckham Rye refreshment house is completed, and, not having been measured, or the final credits given, I cannot give the exact results; but there may be a small excess of cost over the estimate; if so, however, it will be the only instance in the thirty-two works entrusted to the Department, under the new management, in which this will be the case. It should be borne in mind that the expenditure shown in these returns, as incurred upon work not yet completed, as well as upon those which have been completed, both estimated and jobbing, includes the proper proportion of office, yard, and other general charges, as well as interest on capital outlay and working capital, and the repayment of the capital cost for land and buildings at Belvedere-road and Battersea. The past twelve months has the Department during the time given, not been enough to keep these charges down to what I consider to be the normal percentage; especially was this the case in the early part of the year when the shops were absolutely without work save for the small job at Peckham Rye above referred to; but it is reasonable to suppose that the larger volume of work will tend to reduce the proportion of these charges, and further improve the results of the operations of this Department.

Statement No. 5.—This statement shows works completed, certified and presented to the executive Committees, with my reports on each case, but not yet laid before the Council. The result of each of the works being favourable. I do not think they require further comment from me.—W. ADAMS, Manager.

The returns referred to show that, of the works commenced during the late management and completed in 1897, but not yet measured, the original estimate was 3,375*l.*, and the actual cost, subject to audit, 4,018*l.* 1*s.* 9*d.* The works commenced during the late management, and still in progress, were originally estimated at 166,948*l.* 16*s.* 11*d.*, while the total expenditure and liabilities incurred to December 31 last amounted to 162,501*l.* 17*s.* 5*d.* Works commenced and completed during the new management were estimated to cost 4,023*l.*, and the actual cost, subject to audit, was reported to be 3,434*l.* 7*s.* 8*d.* The original estimate of works commenced during the new management, and still in progress, was 97,414*l.*, and the actual cost and liabilities incurred to December 31 last was 37,389*l.* 6*s.* 6*d.* The concluding table in the manager's report deals with works completed, certified, and ready for inclusion in the next half-yearly statement. The original estimate of these works was 16,066*l.* 16*s.* 8*d.*, the revised estimate 13,788*l.* 17*s.* 10*d.*, and the actual cost 10,438*l.* 10*s.* 9*d.*, showing a cost below estimate of 3,349*l.* 18*s.* 1*d.*

Lord Onslow moved that Paragraph 11 be not received. He said it could be shown that the net result of these works undertaken by

the Works Department was a very large increase in cost over what would have been done by contractors.

Mr. Corbett seconded the amendment.

Mr. Ward said that nobody could judge by the figures what the final and total cost would be, because the jobs were not completed, an extra work was not included. If they expected the manager to carry out the work in a proper commercial way, they should not hamper him by calling for these returns.

Mr. Westcott said that they could not still and receive statements without commenting upon them, especially as they felt that the Works Department had no right to exist unless it could do the work as cheaply and efficiently as a contractor. From all that could be seen it would appear that the accounts of the work completed during the half-year to March next would show a still greater loss than those of the past year.

Mr. Bruce observed that he was not at all surprised that Lord Onslow did not vote the returns, because they showed that with the exception all the works carried out under the new management had had satisfactory results.

Mr. E. White said the manager's statement supported the contention of the Moderate party as to the desirability of not being interfered with by the Works Committee. I maintained that it was quite clear from the returns that there had been a total loss of 35,000*l.* made by the Department during the year.

After some further discussion a division was taken upon the motion, which was defeated 161 votes to 53.

Compulsory Registration of Title.—Mr. Jerrom moved:—"That in the opinion of the London County Council, compulsory registration of title under the provisions of the Land Transfer Act, 1897, would not be desirable in this county." The question was not a party one, and the Act was merely an experiment. A voluntary land registry now existed, and was but little used. Sixty-seven important public bodies in London had voted against the application of the Act, and only fourteen in favour.

Mr. Banning seconded the motion, which after a long debate, was rejected by 73 to 35.

Mr. Beachcroft thereupon moved:—"That the Privy Council be informed that the London County Council relies on the Order applying the Land Transfer Act, 1897, to London being so framed that it shall be made to take effect progressively, and shall not in the first instance be made to apply to more than one-fourth of the county."

Sir A. Arnold suggested that it would be more courteous to the Privy Council to substitute for the terms of the resolution a request to the same effect, but in other words, viz., that the order should take effect "according to the letter from the clerk of the Privy Council January 18, 1898."

This was agreed to, and the resolution amended, was adopted.

Electric Lighting of the Embankment. The Highways Committee recommended scheme of electric lighting on the Victoria Embankment and Westminster Bridge, a capital expenditure of 25,300*l.*, and a year cost of 3,500*l.* This was agreed to.

Instruction in the Arts and Crafts.—The adjourned report of the Technical Education Board contained the following statement:—

"The Board has recently made further steps towards the development of art teaching in relation to the requirements of the various industries for which artistic handicraft is essential. Having begun by encouraging the development of technical sides in the principal art schools already existing, and by placing eleven of these upon the footing of 'technical art schools,' the Board proceeded to endeavour to meet the deficiencies that still existed by establishing institutions where the whole of the art teaching should be directed to industrial processes. To a certain extent the schools of art that have grown up in connexion with the polytechnics have tended in the same direction. The schools of art attached to Battersea Polytechnic and the South-West London Polytechnic and the artistic crafts department of Northampton Institute, have all introduced thoroughly practical element into their art teaching. Again, the establishment of the Lithographic School at Bolt-court supplied an example of what might be done towards providing specialised training to members of a particular craft. It was felt to be of great importance to create a series which should give complete courses of training in various allied arts; and with this object the Central School of Arts and Crafts was founded in Regent

rest in 1896 to provide specialised instruction for those engaged in the various artistic crafts which are related to the building trades. This school formed the first instance of the direct supply of technical instruction by the Board; up to the time of the founding of this school the Board had confined itself to aiding the supply of instruction in institutions not directly managed by the Board. The success of the school has been so marked that the Board has recently had to consider the question of providing enlarged accommodation for the classes, as the resources of the building are sometimes heavily taxed by the large number of students that are in attendance. As many as 146 students have attended on one evening, all of these being persons actually engaged in artistic industries. The classes in silversmiths now form an important feature in the school, there being classes for designers, smiths, engravers, metal carvers, and enamellers. 108 students have joined the silversmiths' classes during the present session. Additional classes have recently been started in bookbinding and in embroidery, while a marked increase has been shown in the class on architectural drawing and design. The further step towards the development of art teaching has been quite recently taken by the Board through the opening of a new School of Arts and Crafts at Camberwell, the Camberwell school of Arts and Crafts. . . . An advisory committee, on which the Vestry of Camberwell has appointed five representatives, have approved the appointment of Mr. C. L. Burns, late of the South-West London Polytechnic, as head master, and of the following members of the teaching staff:—For modelling—Albert Tofts, sculptor; for Architecture and Cabinet Design—A. Wickham Jarvis, R.I.B.A.; for Drawing and Design—Louis Rockwell, formerly of the Birmingham Municipal School of Art; for Design—Thomas Kerr, late of the Cheney School of Art; for Painting and Decorating—Alfred E. Bramley, National Scholar; for Wood Carving, day class—Miss Campbell, of the South-West London Polytechnic; for Wood Carving, evening class—W. Amounier, jun.; for Embroidery—Miss Hewitt, formerly of the Royal School of Art Needlework and the South-West London Polytechnic; for Plasterers' work—A. Young; for Masons' work—W. H. Johnson, of the Westminster Technical Institute. Special facilities are being offered at the school for artisans, learners, and improvers to join the classes, and courses have been arranged specially suited for masons, stonemasons and plasterers, and also for masons and workers in black and white. The same low rate of fees for artisans has been adopted as at the Central School of Arts and Crafts, although at Camberwell day classes are also held at which higher fees are charged.

The following evening classes are being conducted during the present session in connexion with the building trades. Most of the classes are led by the Technical Education Board, the principal exceptions being those conducted in the Finsbury College of the City and Guilds of London Institute, the Finsbury Training School of the Carpenters' Company, the Goldsmiths' Institute, and the East London Technical College.—Building construction, architectural drawing, and workshop drawing, at thirty-eight institutions; builders' quantities and quantity surveying, at eleven institutions; brickwork and brick-cutting, at twelve institutions; carpentry and joinery, at twenty-one institutions; masonry and stonecarving, at ten institutions; painters' and decorators' work, including classes on oils and varnishes, at fourteen institutions; plasterers' work, at nine institutions; plumbing, at seventeen institutions; sanitary science, at three institutions; staircasing and hand-railing, at ten institutions; architecture and architectural design, at seven institutions; electrical fitting, at six institutions.

Widening of Drury-lane.—The Improvements Committee recommended, and it was agreed: "That the estimate of 3,900l. submitted by the Finance Committee be approved, and that, subject to the Strand District Board agreeing to contribute one-fourth of the net cost, the Improvements Committee be authorised to arrange for the widening of the road to 40 ft. at Nos. 95, 96 and 97, Drury-lane, and that, in the event of the owners being unwilling to sell the land at a reasonable sum, the Strand District Board be asked to acquire the property compulsorily under the powers conferred by the Act 57 George III., chapter 29 (Michael Angelo Taylor's Act), on behalf of the Council.

Plans for Cremation.—The Parliamentary Committee reported:—"We have considered the Council's resolution on June 1st, 1897, directing us to take measures with the view of obtaining powers for local authorities under the Metropolitan Burials Acts to provide places for cremation. Before giving instructions for the preparation of a Bill to give effect to the resolution, we consulted the Burial Board authorities throughout the metropolis, and ascertained that they were in favour of the proposal. The matter is one that has to be dealt with by public legislation, and we have accordingly had a public Bill prepared. We

have directed a copy of the Bill to be sent to each member of the Council, and we recommend:—That the Metropolitan Burial Boards (Cremation) Bill, as circulated, be approved, and that the Parliamentary Committee be authorised to take the necessary steps for its introduction." The recommendation was adopted.

Plans and Notices of Drainage Works.—The same Committee reported as follows, the recommendation being agreed to:—

"We have considered the following resolution passed by the Council on November 2, 1897: 'That the Parliamentary Committee be instructed to insert clauses in one of the Council's Bills of next session:—(a) Authorising the Council to make by-laws requiring persons about to construct, reconstruct or alter drains in connexion with buildings, to deposit with the sanitary authority such plans and particulars as may be necessary for the purpose of ascertaining whether such construction, reconstruction or alteration is in accordance with statutory provisions and with any by-laws made under Section 202 of the Metropolitan Management Act, 1855; the proposed by-laws to be subject, for the sake of uniformity, to the provisions of the same Act. (b) Transferring to the Local Government Board the powers of the Secretary of State under Sections 202 and 138 of the Metropolitan Management Act, 1855, and Section 85 of the Metropolitan Management Amendment Act, 1862; and providing that by-laws under those sections shall require confirmation by the Local Government Board and not by a Secretary of State.' We have considered it advisable to deal with the matter by means of public legislation, and we have accordingly had a public Bill prepared. In settling the Bill we have, however, thought it advisable to omit reference to the matter contained in paragraph (b) of the above resolution, as it appears to us that such a proposal should emanate from one of the Government departments concerned, and not from the Council. Should the departments consider it desirable to deal with the matter in the Bill, the necessary addition may be made when the Bill is in Committee. We have directed a copy of the Bill to be sent to each member of the Council, and we recommend: That the Bill to authorise the Council to make by-laws dealing with plans and notices of drainage works, as circulated, be approved, and that the Parliamentary Committee be authorised to take the necessary steps for its introduction."

Result of legal proceedings.—The Building Act Committee recommended, and it was agreed: "That the Superintending Architect and manager of the works department be authorised by the Council to enter upon the premises, No. 50, Eglinton-road, Bow, and, in accordance with the order made by the magistrate on January 6, 1898, to do whatever may be necessary to make the structure, which has been erected at the rear, in advance of the general line of buildings in Vernon-road, conform with the provisions of the London Building Act, 1894."

District Surveyor, Fulham.—The same committee recommended, and it was agreed, that Mr. Moseley, who has been District Surveyor for Fulham for nearly fifty-four years, should be called upon to resign that position.

Raleana-road, Blackwall Tunnel.—The Bridges Committee recommended, and it was agreed: "That the estimate of 2,250l. submitted by the Finance Committee for forming the remaining portion of Raleana-road, the construction of a stores building and approach road, and a boundary wall be approved; that the work be carried out at an estimated cost of 2,250l. by the Council without the intervention of a contractor, and that the drawings, specification, and bills of quantities be referred to the manager of works for that purpose."

The Council adjourned soon after seven o'clock.

THE CLERKS OF WORKS' ASSOCIATION: ANNUAL DINNER.

THE fifteenth annual dinner of the Clerks of Works' Association took place in the King's Hall, Holborn Restaurant, on Monday evening. Mr. W. H. Seth-Smith occupied the chair, supported by Messrs. G. Fellowes-Prynne, H. T. Hare, A. S. Flower, E. Monro, Lewis Solomon, A. R. G. Fenning, H. W. White, G. Elkington, Alan Paul, H. Chaffield Clarke, J. Sheppard, E. Brooks, F. E. Brooks, Stanley Clarke, T. Stirling, F. Stirling, S. Wright, Stanton W. Preston, and others.

The loyal and patriotic toasts having been proposed by the Chairman (Mr. E. Monro responding for "The Navy, Army, and Reserve Forces").

Mr. J. Brady, the Editor of the *Clerks of Works Journal*, proposed the "Architects and

Surveyors," coupled with the names of Mr. G. Fellowes-Prynne and Mr. Alan Paul.

Mr. Fellowes-Prynne, in response, said he felt much pleasure in meeting on that occasion his fellow workmen and those interested in the great science and art of building. Architects felt that in clerks of works they had real helpers in their works. Clerks of works were the eyes of the architect, and they held the reputation of the architect in their hands, for an architect who had much work could not possibly be expected to look after every single detail of that work. In regard to the relationship of the clerk of the works to the architect, he could not help thinking that the highest ideal was unswerving loyalty to the architect—though, of course, the duty of the architect to the clerk of works was equally unswerving—and next to that came the utmost integrity and honesty of purpose—and those who had had most experience would feel that these were essentials for clerks of works. There were also tact and judgment, and last, but not least, a firm but just hand in dealing with builders, architects and clients. A clerk of works could also inspire a certain spirit amongst workmen—the spirit of emulation, which could be inspired by his simple example, by his thorough knowledge of the work, and by his readiness to help a workman who might be in difficulties. The clerk of the works had to deal with exceptional difficulties, many of which were equal to the troubles of the architect—difficulties which arose in dealing with the builder and the client and between the client and the architect, and any clerk of works of experience would know how many petty difficulties there were to face, which tried a man's character greatly. One of the great advantages of an Association like theirs was that it brought together men of the same thought, and it resulted in mutual intercourse which could not but be helpful, especially to the younger members of their Association. The *Journal* of the Association was also a very useful little publication, which must be of great value to the members. He had often felt that clerks of works must be tried a great deal in having to work on a small, almost insignificant, job after working upon a large and important work; but they must remember that it was not the work that made the man, but the man who made the work, and that fact ought to be remembered by them, especially by men who had as their aim good and thorough work. They must feel that, however much, or however little, their names might come forward for the work they did, their reward was the consciousness of having done their best. The highest aim a man could have was in doing some work for the good of the work itself.

Mr. Alan Paul briefly replied for the Surveyors. The clerk of the works, he said, was also the eyes of the surveyor, for the surveyor had to depend upon him very much.

Mr. W. S. Woolcott, past President, then proposed the "Worshipful Company of Carpenters." The Clerks of Works' Association, he said, thanks to the Carpenters' Company, was able to hold its meetings in Carpenters' Hall; its President, for the time being, acted as one of the examiners for the Company; and the members of the Association had the use of the excellent library at Carpenters' Hall.

Mr. Stanton W. Preston, Clerk of the Carpenters' Company, in the course of his response, said that he had represented the Company for twenty-one years, and he had seen it rise from a sort of obscurity to the high position it now took amongst the City Guilds; and that position was due to the manner in which they had used their means. The Company was called the Carpenters' Company, but it might more appropriately be called the Builders' Company. In regard to their work at Stratford they had an organised science school of 160 boys, and evening classes which were attended by about 280 boys. At Titchfield-street they had classes for every trade connected with the building trade, and there were 250 evening students at work there.

The Chairman then proposed the toast of the evening, "The Clerks of Works' Association." Having referred to the work of clerks of works, and to the value to the architect of a competent clerk, he said that this was an age of combinations of labour, and it was very important that they should have definite principles on which to combine. The Royal Institute of British Architects had been accused of being a trades union, but he gloried in that accusation and of being a member of a body which could say

that they were 'trades-unionists'—he meant a body for achieving certain objects. The Clerks of Works' Association existed for self-defence and for the protection of its members from any infringement of their rights. It was very important also that they should unite to establish the standard of fair remuneration, which would secure a man of high character and would prevent bribery—such as was practised in the building trade in Continental towns. The secret of such bribery in foreign parts was that men were underpaid. Another advantage of such Associations was that they led to the establishment of a standard of efficiency among the members, and he was very glad to know that the clerks of works had done this, *i.e.*, only admitted men who had had a certain number of years of experience at their work, and had also made it compulsory for a clerk under the age of forty, who desired to join the Association, to pass the excellent examination of the Carpenters' Company. There were excellent means now for giving young men satisfactory training in every branch of building work, and the education that they received was a guarantee of their thorough mastery of the business. A great pitfall of the workmen's trades unions was that they desired to be paid irrespective of their qualifications, and he was glad to know that the Clerks of Works' Association did not accept that view.

Mr. P. J. King, President of the Association, responded, and said that the Association had been in existence fifteen years, and their membership was now about 150.

Mr. Nightingale, past President, proposed "The Visitors," coupled with the names of Mr. H. T. Hare and Mr. Lewis Solomon.

Mr. Hare having briefly replied, Mr. Solomon said that a clerk of works was often called upon to do work that was not in his province. A clerk of works should possess three qualities, *viz.*, truth, thoroughness, and content. Every good architect wished a clerk of works to do his duty and only his duty, which did not include acting as architect.

Mr. A. S. Flower then gave the toast of "The Press," coupled with the name of our representative, who replied; and the other toasts were "The Hon. Treasurer, Mr. J. Oldrid Scott," proposed by Mr. Spooner, and acknowledged by Mr. T. Edmund, Vice-President; and "The Chairman," proposed by Mr. J. G. Peacock.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At recent meetings of the London County Council, the Building Act Committee brought up the following lists of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Hampstead.—Rebuilding of the "Cock-and-Hoop" public-house, and the erection of two houses with shops on the north side of West-end-lane, near West-end-green (Mr. M. T. Saunders for Reid's Brewery Company, Limited).—Consent.

Poplar.—A one-story addition to No. 102, East India Dock-road (Mr. T. D. Burt and Mr. C. E. Theis for trustees of the Poplar Liberal Club).—Consent.

Finsbury, Central.—Wood and slate pents at Nos. 1 and 3, Middleton-road, Muswell Hill (Mr. T. Waple).—Consent.

Lewisham.—Three two-story houses with two-story bay windows on the north side of Beacon-road, Hither Green-lane (Mr. J. W. Webb).—Consent.

Marylebone, East.—A porch and an additional story to the bay window in front of No. 45, Queen's-road, St. John's Wood (Messrs. Booth & Fox for Mr. T. Richards).—Consent.

Woolwich.—A covered way upon part of the forecourt of No. 43, Rectory-place (Mr. J. O. Cook for Mr. A. Moore).—Agreed.

Peckham.—One-story shops upon the forecourts of Nos. 747, 749 and 751, Old Kent-road (Mr. E. Crosse for Messrs. W. Cooper, Limited).—Agreed.

Wandsworth.—One-story shops upon part of the forecourts of Nos. 153, 155, 157, 159, 161, 163, 165, 167, and 169, Balham High-road (Mr. W. C. Jones for the freeholders and lessees of the property).—Agreed.

Wandsworth.—A conservatory on part of the forecourt of Balham railway-station, Balham High-road (Mr. R. Cruwys for Mr. M. Edwards).—Agreed.

Strand.—A glass and iron shelter to project over the public way in front of the principal entrance to

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

No. 3, Cleveland-square, St. James's (Mr. M. E. Collins).—Refused.

Dulwich.—A one-story shop upon part of the yard at the rear of No. 69, Denmark Hill, Camberwell, to abut upon Selborne-road (Mr. J. A. Ham).—Refused.

Fulham.—A three-story addition to 676, Fulham-road, to abut also upon Rostrevor-road (Mr. W. F. Harriss for Mr. G. Burch).—Refused.

Lewisham.—No. 69, Engleheart-road, Catford, with the flank to abut upon Jutland-road (Mr. J. Lawrence).—Refused.

St. George, Hanover-square.—A bay window, at the first floor level, in front of No. 45, Farm-street (Mr. R. B. Marsh for Mr. J. Innes).—Refused.

Line of Fronts and Width of Way.

Newington, West.—An engine-house and office at the proposed electric generating-station on the site of Nos. 22 to 34, Penrose-street (Messrs. Kincaid, Waller, and Manville for the Vestry of St. Mary, Newington).—Consent.

Rotherhithe.—A wall and buttress at Hanover-buildings, Tooley-street, at less than the prescribed distance from the centre of Fair-street (Mr. J. Harnoll).—Agreed.

Erith.—A one-story addition upon the forecourt of a workshop next No. 1, Station-road (Mr. F. Harmer).—Refused.

Deptford.—A two-story addition at the rear of Nos. 109 and 201, Lewisham High-road, to abut upon Lucas-street (Mr. J. J. Dovnes for Messrs. Haycraft & Son, Limited).—Refused.

Peckham.—A one-story addition in front of a workshop on the east side of Devonshire-grove, Old Kent-road (Mr. E. Crosse for Messrs. W. Cooper, Limited).—Refused.

Strand.—A glass and iron covered way in front of the Loudoun Hotel, Surrey-street, Strand (Messrs. Ventom, Bull, & Cooper, for the Loudoun Hotel, Limited).—Refused.

Width of Way.

Islington, North.—A building on the south side of Bowman's-place, Holloway (Mr. J. J. Connelly).—Consent.

Norwood.—A one-story addition to stables at the rear of No. 221, Gipsy-road, Lower Norwood, at less than the prescribed distance from the centre of way leading out of Hamilton-road (Messrs. Marshall & Nelson for Dr. J. S. Sharman).—Consent.

Poplar.—A shed for storing teak on the west side of New-road, near the South Dock entrance gate, erected partially at less than the prescribed distance from the centre of the road (Mr. H. F. Donaldson for the London and India Docks Joint Committee).—Consent.

St. Pancras, North.—A variation from the plan sanctioned on November 30, 1897, for the erection for the erection of a boiler-house and chimney-shed at the Imperial Steam Laundry, Ingestre-road, Dartmouth-park, so far as relates to the erection of the proposed chimney-shaft (Mr. J. M. Kennard for the London United Laundries, Limited).—Consent.

Hampstead.—An addition to the laundry at Hampstead Workhouse, on the north side of Streteley-place, at less than the prescribed distance from the centre of the road (Mr. K. D. Young for the Guardians of Hampstead).—Consent.

Kennington.—An addition at the rear of No. 106, Ethelred-street to abut upon Gundulf-street (Mr. J. Hamilton for the New London Brewery Company).—Consent.

Hackney, North.—Widening of part of Northwold-road, eastward of Alconbury-road (Mr. C. Cheston).—Agreed.

Linehouse.—Two blocks of buildings, to be inhabited by persons of the working class, at less than the prescribed distance from the centre of Bere-street and Cranford-street, respectively (Housing of the Working Classes Committee of the Council).—Agreed.

St. George-in-the-East.—A dwelling-house, with shop on the north side of Watney-passage at the rear of No. 52, Watney-street, the ground story portion of the new building to abut also upon Winter-street at less than the prescribed distance from the centre of that street (Mr. W. Stewart for Mr. C. Craze).—Agreed.

Woolwich.—A mission hall on the east side of Vicarage-road at less than the prescribed distance from the centre of a street leading from that road into Villas-road (Mr. H. F. Sandford).—Agreed.

Wandsworth, detached.—Widening and laying out for building of part of Croxted-road, Herne Hill, between the London, Brighton, and South Coast Railway and Turney-road (Mr. F. N. Kemp for Mr. H. N. Gressell).—Agreed.

Woolwich.—Buildings on the east side of Henley-road, North Woolwich (Mr. A. E. Salmon for Henley's Telegraph Works Company, Limited).—Refused.

Lewisham.—An addition at the rear of No. 16, London-road, Forest-hill, to abut upon Havelock-street at less than the prescribed distance from the centre of that street (Mr. J. R. Vining for Messrs. Mayo & Co.).—Refused.

Width of Way and Deviation from Certified Plans.

Walworth.—A one-story addition at the rear of No. 41, Walworth-road, Newington, to abut upon Ostend-place, and that sanction be given to certain

deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the erection of the proposed addition (Messrs. Canning & Molins for Mr. W. H. Hurlock).—Consent.

Width of Way and Space at Rear.

Finsbury, Central.—That the application of Mr. F. Swift for Mr. H. Roffey be granted for an extension of the period within which the erection of shops with rooms over on Lots 37c, 39, 40, 41, 42, and 43 of the Council's land in Rosebery-avenue, Clerkenwell, was required to be commenced. —Agreed.

Line of Fronts and Construction of Buildings.

Clapham.—A wood and glass show case at No. 78, Northcote-road, to flank upon Bennerley-road, Battersea (Mr. C. D. Collins).—Refused.

St. Pancras, East.—Temporary stabling on the northern side of Great Randolph-street, Camden Town, partly under the viaduct of the North London Railway (Mr. J. J. Connelly for Mr. P. Hearn).—Refused.

Line of Fronts and Space at Rear.

Hammersmith.—That the Council, in the exercise of its powers under Sections 22 and 73 of the London Building Act, 1894, do not consent to the erection of a block of residential flats, with three story bay-windows, in Addison-gardens, and of a shop with flats over on the north-west side of that street, to abut also upon Blythe-road; and that the Council, under Section 41 of the Act, do not allow nor sanction, the erection of the said buildings, respectively with an insufficient open space at the rear, and with portions of each building to extend above the diagonal line as directed to be drawn by the Act (Messrs. Booth & Fox for Mr. Carr).—Agreed.

Deviations from Certified Plans.

Strand.—Deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "Nag's Head" public-house, No. 31, Foubert's-place, Regent's-street, St. James's (Messrs. Goodwyn & Sons for the Lion Brewery Company).—Agreed.

Strand.—That Messrs. Goodwyn & Sons be informed, with reference to their application for the Lion Brewery Company for the sanction to certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of No. 29, Foubert's-place, Regent-street, St. James's, having regard to the fact that more land is shown upon the deposited block plan as to be occupied by the proposed new buildings than was occupied by the building previously on the site, that application is one which, in the Council's view, has no power to entertain, and has, accordingly, neither considered the application nor given an decision thereon.—Agreed.

Open Space about Buildings.

St. George, Hanover-square.—A three-story addition on part of the open space at the rear of No. 3, Charles-street, Mayfair (Mr. C. Scholfield for Mr. Burrall Hoffman).—Agreed.

Finsbury, Central.—That the Council do, in the exercise of its powers under Section 41 (iv) (a) of the London Building Act, 1894, refuse to permit the erection of buildings not exceeding 30 ft. in height upon part of the open space at the rear of the "George the Fourth" public-house, No. 39, Goswell-road, at the corner of Great Sutton-street (Mr. C. Hubbard for Mr. H. Leach).—Agreed.

Width of Way and Construction of Building.

Greenwich.—A wooden shed at the wharf premises, Bugbys's Hole, East Greenwich (Messrs. Flower & Everett).—Consent.

Camberwell, North.—An open iron van-shed at the eastern end of Bullace-row, on part of the garden in the rear of Nos. 6, 7, 8, 9, and 10, Mazzard-row at less than the prescribed distance from the centre of the road (Messrs. J. Ham & Son, for the Winchester Brewery Company, Limited).—Refused.

Formation of Streets.

Wandsworth.—That an order be sealed and issued to Mr. P. E. Pilditch sanctioning the formation of a new street for carriage traffic, to lead out of the north side of Portsmouth-road, Putney, and the widening of a portion of the road from Roehampton to Wimbledon on the east side of the estate. That the name Heathview-gardens be approved for the new street.—Agreed.

Hackney, South.—That an order be sealed and issued to Messrs. F. Chambers & Son (for Messrs. Longbourne, Stevens, & Powell) sanctioning the formation of a new street for carriage traffic, to lead out of Lea Bridge-road, and the formation or laying-out of a new street for carriage traffic, to lead out of Chatsworth-road, in continuation of Fletching-street. That the names Fletching (in continuation) and Wattisfield-road be approved for the new streets.—Agreed.

St. George, Hanover-square.—That an order be sealed and issued to Mr. F. Balfour (for the Duke of Westminster) sanctioning the formation or laying out of a new street for carriage traffic, to lead out

halford-street into South-street. That the name halfour-mews be approved for the new street.—Agreed.

Bermundsey.—That an order be sealed and issued to Mr. R. Dickens (for Lord Llangattock) sanctioning the formation or laying out for carriage traffic of a street, 40 ft. wide, to lead out of Paragon-road into New Kent-road, the widening to 40 ft. of Paragon-mews, and, on the expiration of a lease terminating at Michaelmas, 1907, the widening of a portion of Paragon-road, St. George-the-Martyr, Southwark. That the name Seales-road be approved for the new street.—Agreed.

Wandswoth.—That an order be sealed and issued to Mr. R. C. T. Gordon (for Messrs. A. & J. Wise) refusing to sanction the formation or laying out of two new streets for carriage traffic, to lead out of the west side of Garratt-lane, and the widening of that lane and Trewent-street, on the Garratt Park Estate, Earlsfield.—Agreed.

Leicisham.—That an order be sealed and issued to Mr. J. W. Webb refusing to sanction the formation or laying out for carriage traffic of two new streets, 40 ft. wide, to lead out of Brockley-road and Brockley-lane respectively.—Agreed.

St. Pancras, North.—That an order be sealed and issued to Messrs. Boehmer & Gibbs (for Mr. A. W. Armstrong) refusing to sanction the formation or laying out for carriage traffic of a new street to lead out of the west side of Highgate-road, the surrender of a portion of the estate for the formation of a street on the east side of Parliament Hill, and the dedication to the use of the public of certain land.—Agreed.

Wandswoth.—That an order be sealed and issued to Mr. E. Berry (for the Earl of Leven and Melville) refusing to sanction the formation or laying out for carriage traffic of a new street, 40 ft. wide, to lead out of and return into the east side of Rochampton-lane, Putney, and the widening of a portion of that lane.—Agreed.

Bermundsey.—That an order be sealed and issued to Mr. W. S. Cooke sanctioning the formation or laying out, for carriage traffic, of an extension of Sun-street, 20 ft. wide, to lead into Riley-street, on behalf of the School Board for London. That the name Sun-street (in continuation) be approved for the new street.—Agreed.

Kensington, South.—That an order be sealed and delivered to Mr. W. G. Hunt sanctioning the formation or laying out of a new street, for carriage traffic, to lead out of Addison-road, on behalf of Messrs. W. and A. Wheeler and Mr. W. Warren. That the name Oakwood-court be approved for the new street.—Agreed.

Lewisham.—That an order be sealed and issued to Mr. W. H. Collier, refusing to sanction the formation or laying out, for carriage traffic, of a new street, 40 ft. wide, to lead out of Wearside-road, Ladywell.—Agreed.

Buildings on Cleared Areas.

Chelsea.—That the Council, under Section 44 of the London Building Act, 1894, do disapprove of the plans and drawings submitted with the application of Messrs. Bouchier & Galsworthy, for Messrs. Holt & Sons, for a modification or relaxation of so much of the provisions of Part V. of the Act as relates to a block of residential flats, seven stories high, proposed to be erected on the east side of D'Oyley-street, on the sites of Nos. 12 and 13, and part of Nos. 11 and 14.—Agreed.

Means of Escape at Top of High Buildings.

Strand.—That the Council, under Section 63 of the London Building Act, 1894, do grant a certificate in respect of the means of escape, in case of fire, proposed to be provided for the persons dwelling or employed on the sixth and seventh floors of No. 49, Pall Mall, St. James's (Mr. M. E. Collins for Mr. H. Lovatt).—Agreed.

Strand.—That the Council, under Section 63 of the London Building Act, 1894, do grant a certificate in respect of the means of escape, in case of fire, proposed to be provided for the persons dwelling or employed in the top floors of Horrex's Hotel, Strand, at the corner of Norfolk-street (Messrs. White & Co.).—Agreed.

Strand.—That the Council, under Section 63 of the London Building Act, 1894, do not grant a certificate in respect of the means of escape, in case of fire, proposed to be provided for the persons dwelling or employed in the two top floors of Clun House, Surrey-street, and in the top floor of an extension of the Howard Hotel, Norfolk-street, to abut upon Surrey-street (Messrs. White & Co.).—Agreed.

Westminster.—That the Council, under Section 63 of the London Building Act, 1894, do not grant a certificate in respect of the means of escape, in case of fire, proposed to be provided for the persons dwelling or employed in the top story of the south block of Artillery Mansions, Nos. 75, Victoria-street (Mr. J. Calder for Mr. J. Carter Wood).—Agreed.

Westminster.—That the Council, under Section 63 of the London Building Act, 1894, do not grant a certificate in respect of the means of escape, in case of fire, proposed to be provided for the persons dwelling or employed in the two topmost stories of the Institution of Mechanical Engineers, Storey's-gate, Birdcage-walk (Mr. A. Bache for the Institution).—Agreed.

Recommendations marked † are contrary to the views of the Local Authorities.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.

At a meeting of the Edinburgh Architectural Association, held in the Royal Institution on the 9th inst.—Mr. Thomas Ross, President, in the chair—a paper on "The Vernacular of the Wren School" was read by Mr. J. A. Williamson. Mr. Williamson gave a short history of the Renaissance of Great Britain from the earliest period of its influence in the reign of Henry VIII. till the beginning of the seventeenth century, when the architectural authority of Inigo Jones became paramount. Sir Christopher Wren, as the acknowledged head of the school, was next dealt with. His several distinct achievements in design were described. Mr. Williamson claimed that Wren founded a strictly vernacular school of architecture, based on the principles of Italian Renaissance, and that never having visited Italy, he approached the study of his great works as a man free from the trammels of precedent, in which perhaps the instinct of the engineer rather than the artist predominated. After a reference to the successors of Wren, including such architects as Hawksmoor and Vanbrugh, the lecturer concluded by referring to the cosmopolitan character of the architecture of the present day, arguing in favour of a return to the best examples of the Wren school. The lecture was illustrated by limelight views.—The Association visited on the 12th inst. the new buildings of the Prudential Assurance Company, Limited, in St. Andrew-square, Edinburgh, under the leadership of Mr. Clark, the clerk of works. The members also paid a visit to the premises of Charles Jenner & Co., Princes-street, where they were conducted over the building by Mr. W. Hamilton Beattie, architect. An inspection was afterwards made of the Edinburgh Stock Exchange, where Mr. P. Maxton Cunningham acted as guide.

ARCHITECTURAL ASSOCIATION OF IRELAND.—On Monday night a meeting of the Architectural Association of Ireland was held at the Grosvenor Hotel. The President occupied the chair, and Mr. Cecil Orr gave a lecture on the "History of Architecture." He first showed the origin of design from natural objects, and the rise of Greek architecture from Egyptian and Assyrian work. He pointed out that Roman architecture was a development of Greek work united to the architecture which they had got from the Etruscans. He next showed how Constantine the Great had transplanted the Roman arts to Constantinople, his new capital, where they became united with the eastern work of the Sassanians and Phoenicians. Here Mr. Orr broke off his treatment of European work with the remark that the native work of Ireland was derived, not from the Byzantine school, but from the common origin with the Phoenicians through Carthage. He then dealt at some length with Moorish architecture. In his second lecture Mr. Orr will deal with the development of Gothic architecture.

COMPETITIONS.

FIRE STATION, &c., BOOTLE.—The award in the competition for a central fire station, firemen's dwellings, and district police station, to be erected at Bootle, has just been made known. The first premiated design is by Mr. C. J. Anderson, 30, Dale-street, Liverpool, the second unpriated design being by Messrs. Briggs & Wolstenholme, Central Buildings, Richmond-terrace, Blackburn.

Correspondence.

To the Editor of THE BUILDER.

EASTLEIGH PUBLIC OFFICES COMPETITION.

SIR,—In your last issue you appear to be surprised at the result of the above being known so soon—and no wonder!

The drawings were sent in on February 7; on February 9 printed letters announcing the result were sent to competitors, and the drawings were returned and delivered in London on the 10th! I enclose the printed letter sent. You will observe no mention is made of the number of sets of drawings received. I shall be interested to hear how many sets of drawings this fair-minded Council considered in the time.

From the conditions of competition, in the light

of after events, the following extracts cannot but prove entertaining:—

Any attempt to unduly influence the decision of any assessor will disqualify a competitor.

The Council will probably call in the assistance of an assessor, but do not bind themselves to do so."

If there is any remedy I should be happy to join any others in taking it. I think the Institute should forbid any members competing where there is no definite undertaking to have a professional referee—and I wish every member of the profession would only compete under this condition. The Council also reserved the right to exhibit the drawings. I enclose my name and address if any other competitors care to communicate with you.

A DELUDED COMPETITOR.

* * We have received other letters on this subject; and certainly the fact that the selection was so quickly made and that (apparently) no professional assessor was called in looks rather as if there was a foregone conclusion.—ED.

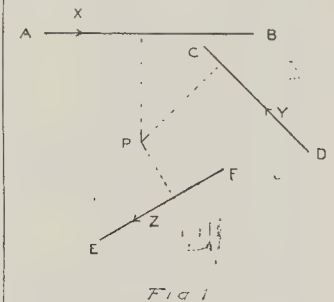
TEXT-BOOKS OF FRENCH ARCHITECTURE.

SIR,—Can you or any of your readers kindly inform me if there is such a thing as an architectural map of France? Further, are there any hand-books specially adapted for a travelling student, and dealing with all the principal monuments of a district from an architectural point of view? If not, is there any little manual other than Corroyer and well-known text-books, which would be specially useful? E. H.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—VIII.

IN introducing to our students the formula for an iron girder, which we gave in Chapter II., we pointed out the limited application which that formula possesses for practical use in the designing of ironwork. More exact calculations, and more satisfactory results, can be obtained by making use of the theory of moments, with which we now propose to deal. The moment of a force is the measure of its activity on any particular point, or, in other words, the moment of a force about a point is the name given to the power which that force possesses to turn anything round that point. If we suppose around any point P a number of forces X, Y, Z, are represented, as shown in the diagram fig. 1, by lines AB, CD, EF, the turning

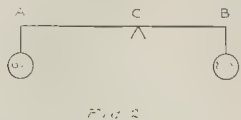


effect which these forces have about the point P is represented in each case by the amount of the force X, Y, or Z multiplied by the perpendicular distance on the lines AB, CD, EF from the point P; so that we may say that the moment of a force about a point is equal to the product of the force multiplied by its perpendicular distance from the point about which it acts.

If the point is at rest or in equilibrium under the action of two or more forces, it can only be so when the effect of those forces which have a tendency to cause it to rotate in one direction is exactly balanced by the effect of those forces, which have a tendency to cause it to rotate in the other direction. To estimate this it must be remembered that the extent of the effect and tendency of each force is represented by its moment.

The theory of moments is the underlying principle governing the action of the mechanical device known as the lever, and the operation of the theory of moments may, perhaps, be best understood by referring to examples of the lever. Let us suppose, in the

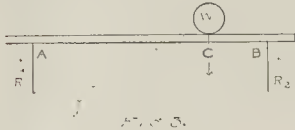
diagram fig. 2, that a rigid bar, whose weight for the sake of simplicity we will ignore, is represented by the line AB, and supported on a point or fulcrum C; let us suppose the



length AC to be 4 ft., and the length CB 3 ft.; then if we have a weight of 6 lbs. at A, we must have a weight of 8 lbs. at C to balance it and keep the lever in equilibrium, as is shown by the equation of the moments:—

$$\begin{aligned} 6 \times AC &= 8 \times CB \\ 6 \times 4 &= 8 \times 3 \\ 24 &= 24 \end{aligned}$$

Let us now apply the principle of moments to an investigation of the action of a load upon a beam. If we suppose, in the diagram fig. 3, that W represents a load AB whose



points of supports are at A and B, the forces which are tending to produce strain in the beam and so to either bend or break it are the load W upon the beam, which acts vertically downwards, and the resistances of the supports at A and B, which act vertically upwards. Our beam, therefore, is a converse example of a lever in which the weight W is a fulcrum and the resistances at A and B are analogous in their action to the weights at the ends of the lever which we were considering above. The effect of the resistance at A is therefore to bend the beam with an amount of power represented by the moment of force; that is, the resistance R_1 at A about a point C at which W is acting. Similarly with the resistance R_2 of the support at B; the bending effect upon the beam is therefore represented by either of these forces or resistances multiplied by its distance from the point C. This is called the bending moment or moment of flexure, and equals

$$R_1 \times AC, \text{ or } R_2 \times BC.$$

Let us suppose the amount of W to be 6 tons, the distance AC 12 ft., and BC 4 ft.

Then R_1 is $\frac{1}{3}$ tons, and R_2 is $\frac{2}{3}$ tons, and the bending moment, or moment of rupture, as it is sometimes called, is

$$\begin{aligned} R_1 \times AC &= \frac{1}{3} \times 12 = 18 \text{ foot-tons.} \\ \text{Or } R_2 \times BC &= \frac{2}{3} \times 4 = 18 \text{ foot-tons.} \end{aligned}$$

In the case of a distributed load the point about which the resistances may be supposed to be acting is the centre of gravity of the load, and this is equally true whether the load is distributed over the whole beam or over a portion only.

The student should be careful to notice that in all cases the sum of the resistances of the two supports is equal to the total load on the beam. In the case of a single concentrated load in the centre, it is quite clear that each of the resistances is equal to half the load. In the case of a concentrated load not central, each support receives a proportion of the load dependant upon its distance from the point at which the load is applied, the load being proportioned between the supports in the inverse ratio of their distances. So that, taking, for example, the instance we have given above, the load of 6 tons is divided between the supports, so that their distances being in the ratio of 12 to 4, or 3 to 1, their shares of the load are in the ratio of $\frac{1}{3}$ to $\frac{2}{3}$, or 1 to 2; or, in other words, the load borne by each support may be found by multiplying the whole load by its distance from the other support, and dividing by the span. In the case of distributed loads, as we have already premised, they may be supposed to be acting at their centre of gravity, and the load may then be apportioned between the two supports in the same way as if a concentrated load of the same amount as the distributed load were placed at this centre of gravity. When the student has to deal with a number of loads, whether these be concentrated or distributed, or partly concentrated and partly distributed,

and whether equal or unequal, the simplest way is to deal with each load in turn and apportion a proper share of each load to each support; then the sum of the apportionments in each case will represent the load carried by each support, and, therefore, the amount of the resistance of these supports, from which the bending moment can be obtained at any particular point in the beam, such bending moment being, of course, equal to the amount of resistance of the support multiplied by its distance from the point about which the moments are taken, thus representing the effect at any particular point of any number of loads however disposed.

As the bending moment is the measure of the bending or breaking force, there must be in any stable condition of a beam some resisting power which is sufficient to balance and keep in equilibrium the force or forces constituting the bending moment. This resisting force is, of course, in other words, the strength of the beam, and its efficiency may be expressed in terms of a moment which is called the moment of resistance, and when the beam is in equilibrium and on the point of breaking, the moment of resistance equals the bending moment or moment of rupture.

In actual calculations dealing with a safe load, due regard must, of course, be given to the factor of safety, and a multiple of the moment of rupture, three, four, or five times, as the case may be, is taken to represent the bending moment, an equivalent moment of resistance to which is to be sought.

In dealing with the bending moment or moment of rupture of beams we have taken no account of the shape of the beam, for in every case the bending moment depends entirely upon the amount and position of the load, and is not affected by the form of the beam exposed to the load. But when we come to consider the moment of resistance of the beam the form of the beam is of very vital importance in determining the moment of resistance. We will first consider those beams in which each fibre throughout the entire cross-section may be regarded as opposing the bending moment by a horizontal or longitudinal resistance. This is always the case in beams of solid cross-section, whether of rectangular, circular, oval, or other such form; and also, strictly speaking, in those with thin solid webs, as rolled-iron joists and rivetted plate girders; but in plate girders it is a very common practice on the score of safety, and also on account of the small cross-section of the web, to neglect its share of the resistance and consider that only of the flanges.

In a beam of solid cross-section, then, each fibre throughout the section of the beam opposes the bending moment of the load by a resisting moment, or moment of resistance of its own. And the moment of resistance of each fibre is its resisting force or strength multiplied by its distance above or below the neutral axis, which may be taken as the point about which the force represented by the strength of each individual fibre is acting. From what has already been said on the subject of moments, the student will at once perceive that the resisting factor or moment of resistance of those fibres or parts of the beam which are furthest from the neutral axis is greater than that of those which are nearest. So that the moment of resistance of the fibres is in a constant and regularly decreasing ratio dependent entirely upon the distance of each fibre from the neutral axis or point of rotation; for we must necessarily assume that the strength or resisting force of each individual fibre is the same throughout the material. It is quite true that the strength of the individual fibres is not exactly equal, but, as we have explained in Chapter III, this lack of homogeneity is one of the reasons for the adoption of a factor of safety, and as we are always prepared to adopt the factor of safety in determining the amount of our safe loads, we are justified in assuming that the various fibres may be regarded for the purposes of our calculations as possessing uniform strength.

The fibres which are furthest from the neutral axis may be taken as exerting their ultimate or greatest strength when the beam is at the point of rupture, but from what we have already said it follows that the resistance of any other fibres depends upon their distance from the neutral axis, or, in other words, is a proportion only of their ultimate strength or resistance. This ultimate strength of each particular fibre we may call the co-efficient of resistance.

BOOKS RECEIVED.

SPECIFICATIONS IN DETAIL. By Frank W. Macey. (E. & F. N. Spon.)
LAXTON'S BUILDINGS. PRICE - BOOK, 1898. (Simpkin, Marshall, & Co.)
RAILWAY MAXIMUM RATES AND CHARGES. Second Edition. By B. M. Cotsworth. (Benrose & Sons.)

GENERAL BUILDING NEWS.

ALL SAINTS' CHURCH, EXMOUTH.—This church just opened, was designed by Messrs. Tait & Harvey, of Exeter. It is built of Barryhead limestone, with windows and doorways of Bath stone. The piers of the arcades are of polychrome stone, polished; the flooring of the chancel is of marble mosaic, and solid wood blocks form the flooring elsewhere. The roof is open timbered, and is covered with Broseley tiles. The church consists of a nave, north and south aisles, and transepts, morning chapel, chancel, baptistery, organ-chamber, and vestries for clergy and choir. The tower has not yet been built. The cost of the work so far has been about 8,000. Seating accommodation is provided for 700 people. Messrs. Luscombe & Son are the builders.

LEAMINGTON PARISH CHURCH COMPLETION.—Additions to and alterations in the Parish Church of Leamington Priory are being carried out according to plans prepared by the architects, Sir Arthur Blomfield & Sons. The proposed works are as follows, namely, to restore the clearstory windows and certain decayed masonry in the existing fabric, to extend the nave westward by two bays, to erect a tower for the reception of the bells at the south-west angle of the nave, to refloor the present nave with wood blocks, and to re-arrange the seats. The work is being dealt with in sections, and the enlargement will increase the accommodation by about 400 sittings.

NEW CHANCEL, ST. JAMES'S, GUNNERSBURY.—The new chancel, which was consecrated on Nov. 10, is in the same nave, with vestries and organ-chamber on the north side. It has been carried out in the Early Pointed style, in harmony with the rest of the church, but the work in the arches, traceried windows, and credence is somewhat richer in character. In the east wall are six large lancet lights, in pairs, which will eventually be filled with painted glass at present only the two outer lights are so completed. These are the work of Messrs. Clayton & Bell, the subjects being "The Man of Sorrows," and "The King of Glory." The screen dividing the chancel from the nave is of light, open oak work. The nave of the church has had extended pew accommodation added. The old choir stalls and choir rail have for the present been fitted up in the new chancel, and the existing organ has been moved to its new position on the north side. The building work has been executed by Messrs. Dorey & Co., of Brentford; the oak screens and reredos by Mr. Caldwell, of Durham; and the tile floors by Messrs. Carter, Johnson, & Co., of the works of the Earl of Arundel, carried out from the designs of the architect, Mr. Howard Chaffield Clarke. The cost has been about 2,750.

REOPENING OF ST. MARGARET'S CHURCH, MOUNTAIN ASH.—The Lord Bishop of Llandaff has just consecrated the additions which have been made to St. Margaret's Church, Mountain Ash. The work was commenced six months ago, and under the superintendence of Mr. Bruce-Vaughan, Cardiff Diocesan Architect, a nave, chancel, organ-chamber, vestries for clergy and choir, tower with six bells, and further accommodation for 250 persons have been added to the church, at a cost of 3,300.

PROPOSED NEW CHURCH OF ST. BARNABAS, MORCAME, LANCAIRE.—The contract for the new St. Barnabas Church has been let to Mr. John Edmondson, and the first portion of the work, which is to cost 3,572, includes the erection of three bays of the nave, the chancel, and the north aisle. To complete the church two more bays of the nave, the south aisle, and the tower will have to be built, but this portion will not be proceeded with at present. The architects are Messrs. Austin & Paley, of Lancaster. This church, when completed, will consist on plan of a nave of five bays, 72 ft. 6 in. long by 24 ft. wide, chancel 35 ft. by 24 ft. (both nave and chancel being the same height, 43 ft. to ridge) north and south aisles 18 ft. and 11 ft. wide, chape 20 ft. by 15 ft. on the north side, opening into chape by two arches, and having a porch as entrance, and an organ transept on the south side. The vestries will be at the east end, with separate porch. At the west end will be a tower 20 ft. square externally, rising 66 ft. to parapet, with porches on the north and south sides of same. The church will be lighted by five four-light tracery windows in aisles, east window of five lights, and the west window of three lights. The roofs and seats will be of pitch pine, the chancel stalls, altar rails, and table being of oak. All roofs (except aisles and towers, which will be leaded) will be covered with Ruabon red tiles. The aisles passages and porches will be flagged, and the chancel tiled. The heating will be by low-pressure hot water.

RESTORATION OF STRATFORD-ON-AVON CHURCH.—An interesting discovery during the restoration work at Stratford-on-Avon Collegiate Church is says the *Leeds Mercury*, that of the undoubtedly

entire Early English lancet window in the south transept. For the purpose of placing some portions of the organ in the transept, an archway communicating with the south aisle was being formed, and when cutting through the massive stone wall the workmen came across the pointed window mouldings embedded in the masonry. The whole of the window was then gradually and carefully uncovered. Unfortunately, it is to some extent mutilated, the projecting mouldings on the inner side having been cut away to obtain a level surface for the wall. The window, which exactly matches one near it overtopping the churchyard, was blocked up about the year 1320, when John de Stratford, Bishop of Winchester, afterwards Archbishop of Canterbury, built the south aisle of the church, the east end of which butted upon the transept, completely obliterating the window. Other interesting discoveries have been made. In getting through the foundations of the side walls for the hot-air pipes some beautifully-moulded stones, believed to be the remains of the monastery which occupied the same site some 300 or 400 years before the Conquest, have been found, together with a few monastic tiles and plain quarries and a quantity of sun-dried bricks of later period, which were brought to light in the excavations in the nave and aisles. The bricks are only about 1½ in. thick, and are said to be at least 600 years old. Fragments of curiously-carved stones of the Elizabethan era have also been found, together with others, believed to be the foundations of the ascent to the altar in the chapel dedicated to the Blessed Virgin at the east end of the north aisle, now filled with tombs and monuments of the Clopton. Near the west end, at the foot of one of the columns of the nave, embedded in the foundation, the workmen came upon a worked stone, believed to be the base of the holy water stoup, which was probably transferred from the church at the time of the Reformation. The work of restoration is being carried out under the supervision of Mr. Bodley.

RESTORATION OF CHANCEL, BOURNE ABBEY CHURCH.—Bourne Abbey Church has just been reopened after restoration to the chancel. The walls and stonework of the chancel have been cleaned down and replastered. The memorial mural tablets have been raised, to give way to oak-paneelling, which now extends the entire length of the chancel. The seating is of English oak. The eight terminals of the new choir benches carry emblems of the sacrament of the Lord's Supper. The screen dividing the nave from the chancel is of English oak tracery, bearing effigies of the four Evangelists, with their emblems. The four three-light brass pendants (incandescent lights) are the work of Messrs. Elgood, Leicester. The builders' work has been carried out by Messrs. Roberts Bros., Stamford. The carved work, the emblems, and the screen, are by Messrs. Harry Hems Bros., Leicester. Mr. J. C. Traylen, of Stamford, was the architect.

PROPOSED TECHNICAL SCHOOL FOR MACCLESFIELD.—The Macclesfield Town Council have adopted the minutes of the Technical Instruction Committee, sanctioning the erection of a new technical school on the site of the Useful Knowledge Society's premises on Park Green, which have been bought for 2,000l. The total cost will be about 2,000l. Mr. James Stevens, of Manchester and Macclesfield, is the architect.

PROPOSED TECHNICAL SCHOOL, GLOSSOP.—At the meeting of the Glossop Town Council, on the 10th inst., plans were submitted of a technical school, which Lord Howard proposes to build on a site opposite the Free Library. The architects are Messrs. Douglas & Minshall, of Chester. The school will be three stories high.

INFANT SCHOOL, LEEDS.—The new infant school in Hunslet Hall-road, Leeds, was opened on the 10th inst. The building is built of brick, with stone dressings, and is intended to take the place of the present Beverley-street Infants' School. The site contains nearly 7,000 square yards, and is bounded on three sides by wide streets. The school is arranged for 750 infants, who will be accommodated in eight class-rooms (sixty each) and two large rooms, each containing accommodation for 120. These latter rooms are to be used for babies only, and are provided with open fireplaces. A large assembly hall is provided, into which the classrooms will open direct. Three entrances are provided, with cloak-rooms adjoining, and there are large playgrounds, separate buildings for manual training and a playground for a manual training workshop and class-room, which will take the place of the Beverley-street School workshop. The dados inside the school are glazed brick; all the inside woodwork is pitch-pine varnished. The total cost of the site, buildings, and fittings (including workshop fittings and caretaker's house) is 3,000l. The material has been selected from plans prepared by Mr. Brathwaite, the architect to the board. The contracts for the work have been carried out as follows:—Stone and brickwork, by Mr. William Airey; joiners' work, by Mr. B. Wood; plumbing work, by Mr. J. E. Bedford; plastering work, Messrs. Pennington & Son; slaters' work, Messrs. Watson & Worsnop; painting work, Mr. Cameron; concuring work, Mr. McFarlane; ironwork and heating arrangements, Messrs. Holmes & Co.; gas-fittings and cloak-rooms, Messrs. Longfield & Co.

PROPOSED OPERA HOUSE, ILKLEY.—The erection of an opera house is included in what has now become known as the Ilkley Winter Garden scheme. Plans have been prepared by Mr. F. Matcham, of London. The building, which will have a frontage to Wells-road, is estimated to cost about 13,000l., and, in addition to the opera house, it has been decided, since the plan was prepared, to add a large dining-room. The opera house itself is to seat about 1,500.

BUILDING IN ABERDEEN.—The Plans Committee of the Aberdeen Town Council have sanctioned plans of the following:—New shop front at No. 80, Waterloo Quay, for Mrs. Joss, per Mr. William Smith, architect; two dwelling-houses on the south-west side of Elmfield Avenue, for Mr. Robert Mitchell, builder, per Mr. James Mitchell; seven dwelling-houses on the south side of Victoria-road, Torry, for Mr. Isaac Emslie and Mr. John W. Forbes, per Mr. William Ruxton, architect; dwelling-house, milk-shop, stable, and coach-house on the south side of Belvidere-place at its junction with Craigie Leatings, for Mr. Alexander Hall, per Messrs. Walker & Duncan, architects; four dwelling-houses on the west side of Blenheim-place, for Mr. John McGregor, builder, per Mr. William Beattie, architect; alterations in connexion with property at the corner of Back Wynd and Gaelic-lane, for Mr. William Reid, per Messrs. Brown & Watt, architects; provision works on the west side of a new street running northwards from Links-street, for the executors of the late Mr. William Bruce, per Mr. Alexander Mavor, architect; three dwelling-houses on the west side of Ann-street, for Mr. Hugh Macdonald, per Mr. Duncan Hodge, architect. The committee had before them the plan of a stone-polishing mill, &c., on the north side of an intended new street running eastward from King-street, for Mr. Thomas J. Blann, per Mr. William Smith, architect, but could not sanction the plan, as the proposed street has not yet been sanctioned by the Town Council.

BUILDING IN BOLTON DISTRICT.—The monthly meeting of the Rural District Council for the Bolton Union was held on the 2nd inst., at the Poor Law Offices, Mawdsley-street, when the Clerk submitted the proceedings of the General Purposes Committee, which includes various departments, during the past month, and they were agreed to by the Council. During the year 229 plans were submitted, against 207 last year. Those approved totalled 185 against 168, and those disapproved numbered 44 as against 30. The plans which have been submitted are for the following amongst other purposes, viz., the erection of 522 dwelling-houses; additions to dwelling-houses, 75; additions to farms, 12; additions to bleachworks, 4; and for new dyeworks in Brightmet; and new Board school at Belmont. Of the 522 dwelling-houses, the numbers in the respective townships are as follows:—Smithills 167, Tonge 125, Great Lever 83, Middle Hulton 65, Over Hulton 37, Heaton 21, Harwood 20, and Lostock 4.

BUSINESS PREMISES, MAIDENHEAD.—A new furniture depository has been erected in Bell-street, Maidenhead, for Mr. Truscott. The building is of red brick, and was erected by Mr. John Wells, from plans prepared by Mr. C. A. Vardy.

PROPOSED ENLARGEMENT OF MCHEYNE MEMORIAL CHURCH, DUNDEE.—Mr. Sidney Mitchell, Edinburgh, has prepared plans for the enlargement of this building. The cost of the enlargement will be about 2,000l.

NEW BUILDING FOR THE ROYAL INSURANCE COMPANY, LIVERPOOL.—The corner-stone of a new building for the Royal Insurance Company has just been laid in North John-street, Liverpool. When the directors of the company decided upon raising a new building, competitive designs were invited, and the architect chosen was Mr. J. Francis Doyle, of Liverpool, whose plans were put first by the assessor, Mr. Norman Shaw, R.A. The style is Classic, adapted to modern requirements. The sub-structure is composed of grey Aberdeen granite to a height of 30 ft. above the pavement level. The superstructure will be composed of white Portland stone, and roofed with green slates. To the Dale-street front will be a gable rising 110 ft. above the pavement. In North John-street will be placed the main entrance, which will be surmounted by a tower 150 ft. high. At the south end will be the entrance for tenants, which also is embellished by a tower. A feature in the building is the steel construction, mainly introduced to obviate the necessity of columns on the ground floor, which, for fire reasons, will be utilised as the general offices of the company. The main weight-carrying girders are placed upon the third floor, resting at the ends upon steel stanchions built into the walls, and from which are slung the two floors immediately beneath. Internally, it is intended very largely to utilise marble tiance or panelling for the walls in lieu of the ordinary plaster, this material being reserved for ceilings only. The building, rectangular in shape, will be about 220 ft. long by 52 ft. wide, and on the ground floor the general office will be of the dimensions of 104 ft. long, 48 ft. wide, and 21 ft. high. The private offices will also be on this floor, facing Dale-street, and only separated from the general office by a hall 20 ft. square. On the floors immediately above will be arranged the various official departments required for the company's business, including an apartment for the board of directors. It is also intended on the top floors to

provide dining accommodation for the staff, the whole of the basement being reserved for the strong rooms and store space for books, &c. On the upper floors, at the south end of the building, will be offices arranged for letting purposes. It is proposed to heat the whole of the interior by hot water on the low-pressure system, and to light it by electricity. Elevators will be provided in both entrances. The new building will extend from Dale-street to the return side street, a distance of 212 ft., but the present operation only consists of two-thirds.—*Liverpool Mercury.*

THE GUILDHALL ART GALLERY.—The Corporation of London have recently sanctioned a scheme for the extension of the Art Gallery at the Guildhall at an estimated expense of 1,600l. The plan which has been prepared by Mr. A. Murray, the City Architect, shows the absorption of the ground-floor offices of the Land Tax Commissioners and the Mayor's Court in Guildhall-yard. The newly-acquired space will consist of three rooms connected with each other and lighted with separate skylights, a connexion with the existing galleries being made. The total floor area of the additional rooms is about 1,700 sq. ft. superficial. Accommodation has been arranged for the Mayor's Court officials by utilising space now occupied by the Land Tax Commission. It has, however, been decided that no steps shall be taken to carry the scheme into effect until equivalent accommodation at the existing rent has been provided in or about the Guildhall for the Tax Commission, whom the proposal would displace.—*Times.*

BANK PREMISES, WORTHING.—The Capital and Counties Bank, Worthing, having secured a large block of premises adjoining the Municipal Offices in South-street, the principal street in the centre of the town, have rearranged the whole of the basement, ground, first, second, and third floors. The ground floor has been reserved for banking business, having red polished and fluted granite pilasters, with blue pennant stone, moulded bases, and carved capitals. The work has cost about 3,600l., and has been executed by Messrs. Frank Sandell & Sons, of Worthing. The work of warming by hot water was carried out by Mr. John Phillips, of Brighton; the wood block flooring in tank and oak by Messrs. Loundley & Charteris, of Crawley, Sussex; the marble mosaic pavement by Messrs. Mainzer & Co.; the brass and ironwork by Messrs. Hardmann, Powell, & Co.; the strong room fittings by Messrs. Chubb and the Ratner Safe Company; and the fireproof flooring by Mark Fawcett & Co. Mr. R. Singer, of Worthing, was the architect.

SANITARY AND ENGINEERING NEWS.

BRIDGE ACROSS THE TAWE.—A new bridge, erected by the Swansea Harbour Trust to supersede the bridge that has provided means of access between Swansea proper and St. Thomas, has just been opened. The bridge has cost about 30,000l., and was designed by the engineer, Mr. Schenk, the contract being given to Messrs. Handyside, of Derby, with sub-contracts to Messrs. Armstrong and other firms. The bridge provides for two lines of road traffic, one of railway traffic, and two for foot-passengers. The old bridge was a drawbridge, and this one is a swing bridge. The drawing portion of the structure is 72 ft. long on the land side from the centre of rotation, and 92 ft. 6 in. measured from the same point over the navigable channel, while there is a fixed portion on the eastern side of the swinging span 70 ft. 9 in. long, making the total length from side to side 234 ft. 6 in. The total width of each roadway for vehicular traffic is 7 ft. 6 in.; the width of each footway 6 ft. 3 in., and the width of the railway 5 ft., making, together with the necessary clearances, 45 ft. over all. The main girders are 27 ft. apart in the clear, braced together overhead at the centre of the swinging span, this giving a height in the middle of 20 ft. clear. The bridge swings up stream, and is made to revolve by hydraulic machinery placed in a house on top of the main girders in the centre of the bridge, the gear being under the control of one man. The bridge is protected when open by a timber dolphin, composed of piles driven into the bed of the river, and braced together on the Channel side with continuous vertical tenders.

WATER SUPPLY TO COUNTY ASYLUM, MORPETH. At a meeting of the County Council of Northumberland and the report of the Committee of Visitors regarding the proposed water supply to the County Asylum at Morpeth was unanimously adopted. The scheme provides for the conveying of water in a 6 in. main from a spring at Doe Hill in the Witton Shields district to the Asylum, a distance of over seven miles. The mains are to be of cast-iron pipes, properly coated, and to be tested to a head of 600 ft. at the maker's works, and, after being laid and jointed in the trenches, are to be tested to a pressure of 50 per cent. more than the working head, thereby minimising any chance leakage. Sufficient stop, scour and air valves will be placed on the system. The spring, which can give the quantity of forty gallons of the Asylum 100 gallons daily per head, being much in excess of the quantity of forty gallons required by the Lunacy Commissioners, is subject to very slight seasonal variation. At the source an iron cylinder will be sunk down to the level of the spring, the water then being conveyed to a storage-

facilities of tuition they have afforded be extended. One of the causes which have militated against the financial success of the Palace has been the inadequacy of the railway facilities. It is an essential element of the new scheme that great improvements will be made in this respect. The announcement appears to be rather vague, but we hope it is true.

SHOREDITCH ELECTRIC LIGHT AND DUST DESTRUCTOR UNDERTAKING.—At a meeting of the Shoreditch Vestry recently, Mr. H. E. Kershaw, Chairman of the Electric Light Committee, said that owing to the unprecedented success of the Vestry's efforts in the combined scheme for the generation of electricity from the steam supplied by the dust destructor, the Committee recommended the Vestry to reduce the charge for electricity from 6d. per unit for the first two hours and 4d. per unit for the surplus to 6d. per unit for the first hour and a half and 2d. per unit afterwards. This would work out to consumers of electricity using the light for three hours per day at 4d. per unit; four hours per day, 3d. per unit; six hours per day, 2d.; and so on, reducing the cost in proportion to the number of hours the light was in use. After existing for six months only, they were supplying electricity, within a little, as cheaply as any municipal installation in the country. During the past quarter they had sold 95,000 units of electricity, and the engineer's estimate for the current quarter was 150,000 units.

THE COST OF BUILDING.—On the 31st ult. Mr. George Eadie, builder, lectured under the auspices of the architectural section of the Glasgow Philosophical Society. The lecturer, who took for his subject "The Cost of Building Forty Years Ago and Now," compared the cost of erecting a four-story tenement (having a frontage of 356 ft.), consisting of three houses on a stairhead, each consisting of a room and kitchen, and one of a single apartment. In 1857 the mason and brick work of such a tenement cost 953l. 9s. 4d., while now the cost would be 1,310l. 7s. 10d. The mason and brick work then cost 826l. 17s. 6d. for such a building; now it cost 868l. 6s. The slater work then cost 28l. 10s. 2d., against 49l. 7s. 8d. now; plumber work then cost 41l. 19s., against 17l. 12s. 8d. now; plaster work then cost 168l. 10s., against 240l. 12s. 10d. now; painting and paperhanging then cost 70l., against 85l. now; other tradesmen's work amounted to 74l. then, as against 80l. now. The total expense of erecting such a building in 1857 was 2,273l. 18s., while a building of the same class to-day cost 2,751l. 7s., an increase of 21 per cent. Wages had doubled within forty years, and he reckoned that workmen's wages showed a total increase of 80 per cent. Materials had risen in cost 58 per cent. A house rented at 8l. 15s. forty years ago would now bring 10l. 15s.; a two-room-and-kitchen house costing then 15l. would now bring 22l.; and a three-room-and-kitchen house costing then 24l. would now bring 28l. He attributed the increase to the building regulations now in force and to the greater conveniences and ornamentation in present-day houses. He held that rents were very much less to-day than they ought to be, and that was due to interest being cheaper now than it was forty years ago.—*Glasgow Evening Times.*

IRISH SHRINES.—A lecture on Irish shrines was given recently in the Science and Art Museum, Dublin, by Mr. George Coffey, the Curator of the collection of Irish antiquities. Mr. Coffey, in introducing the subject, explained that while Irish history—as it appeared in contemporary records—appeared to consist mainly of wars and rumours of wars, the examples of Celtic art which have been handed down to us prove that there must have been in the country an ordered civilisation persisting throughout many centuries, and that so far from confusion being the prevailing condition, an environment must have existed which was eminently suited for the production of fine works of art. The pre-Christian Celtic artists and craftsmen made very great use of what is known as the "Trumpet Decoration"; this was composed of interwoven spiral ornament combined with almond-shaped decoration. In the course of time this spiral decoration gave way to what is known as interlaced, or ribbon work decoration, into which grotesque figures of animals were frequently introduced. The shrines in the collection of Irish antiquities were then dealt with in detail by the lecturer. Most of these belong to the eleventh and twelfth century, but one—the shrine of St. Molaise—was assigned to a considerably earlier period. The Irish inscriptions on the shrines are usually found to consist of prayers for the prince or king under whose direction the work was accomplished, the artificers engaged in the work, and the "keeper" of the shrine. It was explained by the lecturer that these shrines were usually entrusted to the care of some family, and passed on from father to son. The history of all the shrines in the Irish collection is well known, and the links which bind these beautiful art objects to the historic past of our country are perfectly clear. In most cases they came from the family of the "keeper of the shrine" into the possession of some antiquarian, and were then presented to, or purchased by, the Royal Irish Academy. In conclusion, Mr. Coffey hoped that all those who were present would be led to take a real interest in the beautiful Irish decorative work, of which so many fine specimens were to be seen in the museum—one of these, the Tara brooch, being the finest piece of work of its kind in the world; and he also advised all Irish artists who wish to "revive" Celtic art to

endeavour to get inside the spirit of the time in which it was produced, and not to be content with mere imitation, which could never lead to the production of really good work.—*Freeman's Journal.*

ELECTRIC LIGHTING IN LIVERPOOL.—A meeting of the Lighting Committee of the Corporation was held on the 4th inst., in the Municipal Offices, Dale-street, when the electrical engineer was empowered to proceed with a portion of the extension of the mains provided for by the estimate for the current year. The work in question embraces a trunk main from Paradise-street via Hanover-street to Renshaw-street, and a trunk main from the residential districts of Wavertree, Smithdown-road, Allerton-road, and Green-lane, a main to join the Mossley Hill district by Penny-lane and Sefton Park district via Greenbank-drive, mains in Wavertree-road, Tunnel-road, Lodge-lane, and Bentley-road, joining to Lark-lane Station; and mains in Byrom-street and Scotland-place connecting with mains already laid. The estimated cost of this work is 16,947l.

EXCAVATIONS AT CARDIFF CASTLE.—Excavations are now taking place in the knoll that forms the north-eastern extremity of the castle walls. For many centuries the trees have grown unmolested upon this spot, but within the past few weeks six or eight of the largest of them have been cut down. Their removal has been necessitated by the excavations which are taking place. It is common knowledge that the Marquis of Bute has for some time past been reconstructing the old castle wall from a point at the rear of Duke-street for a distance of a hundred yards parallel with the North-road. The wall has now been erected to within thirty yards of the corner, at which it will meet the other old castle wall at right angles. In all probability a large tower will be erected at the N.E. angle at which the walls will meet. For centuries the earth at this corner has sloped upward from the canal bank to a height of about 30 ft. What formerly existed at that corner has never been known, but the excavations of the past few days have brought to light the fact that in the very heart of the huge earthwork there has laid buried for many centuries what appears to be the rubble foundation of an angle tower of undoubted Roman origin. An examination of the excavation, as at present made, shows that at the left-hand side of the mass of masonry now laid bare may be seen portions of the old ashlar facing of the tower. The mass of rubble behind this clearly displays the method of building resorted to by the Romans in erecting walls of great thickness and strength.—*South Wales Daily News.*

NEWCASTLE SOCIETY OF ANTIQUARIES.—The eighty-fifth anniversary meeting of the Newcastle Society of Antiquaries was held at the Castle on the 26th ult. Mr. Cadwallader Bates presiding, in the absence of the President, Lord Ravensworth. The annual report stated that, though very inadequately supported by the Northumbrian public, the Northumbrian Excavation Committee continued its operations last year, and had achieved some interesting results. The Roman camp of Aesica (Great Chesters) has again been the scene of the excavators' labours. A large building outside of the camp on the south-east has been excavated and reveals several chambers, some of them furnished with hypocausts; this was probably the home of one of the officers of the garrison with his family, or, from the size of the building, we may conjecture that more than one distinguished family has here taken up its quarters. Excavations have also been made in the centre of the camp, which have at last brought to light some inscribed stones. Three fine examples have been discovered. Other Roman inscriptions recently discovered include the slab at Chesters recording the supply of water to Cularnum while Ulpian Marcellus was governor of Britain, and whilst the second cohort of Asturians was in garrison, and an altar at South Shields, naming Julius Verax, a centurion of the sixth legion. The eastern portion of the late sixteenth century pele of Doddington, the most prominent object in the village, and a picturesque building, and "one of the most charming remains of Border architecture," fell down during a storm in the early part of the year; the remaining portion is in danger of sharing the same fate. It has been asserted that there is neither written history nor tradition about the tower, but, as has been truly said, its history "was clearly written on its walls." In 1584 Sir Thomas Grey was obliged to build a strong house of this description for the protection of his tenants at Doddington, but art and industry had so decayed on the Border that he was unable to build it of better masonry. It is of great importance to keep up this unique building now that its counterpart at Kilham is gone. The members of the Armourers Company have granted a repairing lease of the Herber Tower to the Corporation of Newcastle for a long term, so that this interesting and valuable building, the most complete of the few wall towers remaining, is now saved from destruction.—It was agreed to promote an exhibition of old silver secular plate in private possession in the Northern counties.—*Newcastle Leader.*

CAPITAL AND LABOUR.

RUGBY CARPENTERS AND JOINERS AND THEIR WAGES.—In January last the carpenters and joiners of the town unanimously decided to ask the masters to raise the standard rate of wages from 7½d. to 8d. per

hour, to provide lock-up places for the safe keeping of tools on all buildings in course of erection, and that they should have payment for overtime at the rate of time and a quarter after ten hours' work, instead of after eleven as hitherto. The masters have decided to increase the rate of wages and provide the lock-up places, but they decline to accede to the request of the men as to overtime, and at a meeting of the men it was unanimously decided to accept the master's terms. The arrangement affects nineteen employers and some 200 workmen, and will come into force on March 31.—*Rugby Advertiser.*

CARDIFF MASONS' STRIKE.—Masters and men in the building trade of Cardiff met in conference on the 9th inst., the former at the Royal Hotel and the latter in the Gladstone-hall. Earlier in the day a joint conference was held, between the representatives of both sides, lasting from eleven till one and from two till 3.30, but no decision was arrived at. The representatives from both sides submitted the proposals to a general meeting in the evening, and the masters' association confirmed the proposals made by their representatives. The employers' meeting closed at ten o'clock. The men's meeting was more protracted, and it was adjourned.

LEGAL.

MASON & CO. V. WOODTHORPE.

At the Guildhall a few days ago, before Mr. Alderman Truscott, Mr. Edmund Woodthorpe, District Surveyor of the northern division of the City, appeared to a summons at the instance of Messrs. Mason & Co., of the Barbican, the building owners of certain work to be done on the premises at 19, Australian-avenue and 1, Cotton-street, who were stated to be dissatisfied with his decision as to certain work to be done upon the premises, which was alleged to be in contravention of the London Building Act, 1894. Mr. J. R. Atkin appeared for the appellants, and Mr. Woodthorpe conducted his own case.

Mr. Atkin said that Messrs. J. B. Coates (the Central Agency) were the occupiers of the basement and the first and second floors of 1 and 3, Cotton-street, and as the business expanded they wanted to take the ground floor of No. 18, Australian-avenue, and in order to do so, though these were originally separate buildings, they were desirous of having only one ground floor. To this Mr. Woodthorpe had given notice of objection, arguing that the place was only fit for one occupation. Now, the only object of this particular section of the Act was protection against fire. He submitted that the taking of a room at 18, Australian-avenue would in no way increase the danger in case of fire, and the premises were adapted for one occupation, thus making the construction of the Act.

Mr. Flint, A.R.I.B.A., was called, and said these premises could be made to connect, and were adapted for one occupation. The risk by fire would be no greater with the iron door it was proposed to place in the room.

Mr. Woodthorpe held to his original notice. The Alderman remarked that he had paid great attention to this matter. He had visited the premises, and had left nothing undone that would assist him in arriving at a right decision. He came to the conclusion that he must uphold the notice of the District Surveyor, but did so with considerable regret. He would be glad to state a case on the point, as the Building Act seemed to him a difficult problem.—*Times.*

THE CLAIM AGAINST THE ST. PANCRAS GUARDIANS:

THE DAMAGES ASSESSED.

The case of Drew-Bear and others v. The Guardians of the Poor of St. Pancras came before Mr. Justice Ridley, in the Queen's Bench Division, on the 10th inst., for judgment as to the damages to be paid by the defendants to the plaintiffs in respect of the breaches of contract found by the Court of Appeal in connexion with the building of the St. Pancras Workhouse. The history of the case has been fully reported in former issues (see the *Builder* for November 21 and 28 and December 5, 1896; January 23 and 30, March 6 and 13, April 17, May 22, and November 6, 1897; and January 15, 1898).

Mr. R. M. Bray, Q.C., and Mr. A. A. Hudson appeared as counsel for the plaintiffs; and Mr. English Harrison, Q.C., and Mr. Wm. Moyes for the defendants.

Mr. Justice Ridley, in giving judgment, said that the case was one in which he had to assess the damages to which he might think the plaintiffs entitled according to the judgment of the Court of Appeal. As he understood it, the judgment of the Court of Appeal laid down that the plaintiffs were entitled to damages by reason of the contractor not having been allowed to get possession of the site in question, but that they were not entitled to anything in respect to the acts of the architects; therefore it was not a case in which it could be said that the whole of the contract was at an end, and the plaintiffs were entitled to quantum meruit, but the amount of damages they were entitled to must be ascertained in respect of such injuries as resulted to the contractor in not having possession of the site given to him by the Guardians. The evidence which

had been called before him (his Lordship) on the different heads of damage was of a general character, the witnesses examined before him speaking in their experience as surveyors and builders, and giving their opinion as to what percentage a builder would find his cost increased if he did not get possession of the site. That, he thought, appealed to anyone's sense. If a contractor had four or five blocks of buildings to be erected anybody could see in a moment it was of the greatest consequence that the whole site should be clear so that the builder could map out his work and get it pushed forward so that each part helped the other. If the contractor was obliged to build one portion at a time the work became dislocated, and the more buildings he had to put up the worse it was. That was the nature of the present case as it seemed to his Lordship. It was, indeed, some time before he personally arrived at the conclusion that it was of so much importance in the case. No doubt interference by the architect did cause delay to some extent, but he thought that the real cause of the mischief which upset the calculations of the contractor, and the expectation of the Guardians as to the completion of the work, was mainly due to the fact that possession was not given of the site. That was the way the contract was broken. On the other hand, it must not be forgotten that on the previous occasion it was the plaintiffs who contended, for the most part during the inquiry, that the architect was the person who had prevented the job being carried out, and certainly he did interfere far more than usual in respect to materials brought on the job and to work done on the job. In the second inquiry, as to the damages, the case was reversed because the plaintiffs were formerly contended that by reason of that interference the job was prevented from being carried out, said that the real cause of the injury was not getting possession of the site. The truth of it was, that although there was some delay caused through the interference of the architect, one's sense told one that the real cause of the delay was not getting possession of the site. It was very unfortunate that this was not done. It was necessary to deal with the different heads of damage put forward. He did not mean to go through the whole history of the case again. He had considered the matter as well as he was able on the materials before him. The first head of damage claimed was in respect to the increased cost of the labour by reason of the delay in getting possession of the site. The witnesses called by the plaintiffs had calculated this at the large sum of 6,357l. That was established by a strong body of evidence as the ratio or proportion which, in the trade, would be attributed to the failure of getting possession of the site. On the other side there was no evidence whatever of any account. There was no contradiction of it, and nobody called or put forward to say it was not so. The position the defendants took was, that it was not right, according to the judgment of the Court of Appeal, that this should be taken into consideration, but his Lordship thought it was. He thought that, dealing with such a case as the present, he ought to be guided by the opinion of those who understood the trade. He thought it was within the decision of the Court of Appeal that he should assess the damages to the best of his ability on the materials put before him. The percentage given by Mr. Chippell and other witnesses was not contradicted. He did not mean to say he was prepared to accept it to its full extent. He did not think that the interference upon the roads by the traffic of the Guardians was made out by the plaintiffs. What he had been able to arrive at on this head was, that in place of the 6,357l. claimed, the plaintiffs were entitled to 4,000l. Then there was the claim for increased price of labour, from and after September 1, 1893. That he had included in the sum of 4,000l., and he added nothing for that. In the same way as to the profit of 10 per cent., that also was included in the sum of 4,000l. As to the claim from interference by sub-contractors, he thought, looking at the evidence given, it was exaggerated, and the sum of 250l. was as much as the plaintiffs were entitled to in respect to that matter. Then on the claim as to the increased price of materials from September, 1893, although somewhat in dispute, he thought, on the whole, that the prices of materials were raised a good deal then. He could not, however, put the loss on that head as high as the plaintiffs had done. He thought they ought to have 500l. for that. As to the claim for establishment charges, &c., he allowed 1,250l. The charges as to loss of profit and failure to get possession of the capital outstanding he put together and allowed 1,000l. upon those heads of claim. The total of all these sums was 7,000l.

Mr. Bray: Your Lordship will give us judgment for this amount with costs?

His Lordship: Yes, I think the damages ought to be assessed at 7,000l.

Mr. Bray: The amount paid into Court by the defendants was 2,500l., so, therefore, I am entitled to costs.

His Lordship: I think you are entitled to the costs of this hearing. The Court of Appeal has dealt with the other costs.

Mr. English Harrison: Then, technically, judgment will be for 4,500l. in addition to the sum paid into Court?

His Lordship: Yes.

Mr. English Harrison: Will your Lordship allow me a stay of execution for about three weeks to consider the effect of your Lordship's judgment? The money is absolutely safe.

Mr. Bray: Have we not had enough of this? His Lordship: I think so. I will not stay anybody's execution in this case. I do not wish to stop people taking appeals, but has there not been enough litigation? This is the best I can do for you.

Mr. English Harrison: I would like a stay for three weeks if your Lordship please. I do not think it is unreasonable under the circumstances. Does your Lordship refuse it or not, because I would rather have it in a proper form and then we know where we are.

His Lordship: Stay of execution for a fortnight. The plaintiffs will be entitled to the 2,500l. in Court in part satisfaction of their judgment.

AN OFFENDING SUMMER-HOUSE AT FOWEY.

THE case of Purcell v. Chinnock came before Mr. Justice Kekewich in the Chancery Division, on the 11th inst., on a motion by the plaintiff for an *interim* injunction to restrain the defendant from permitting to remain erected, and for a mandatory order to pull down, a certain building on a plot of land situated on the Esplanade at Fowey, in the county of Cornwall. It appeared from the statement of Mr. Warrington, Q.C., who appeared in support of the motion, that the plaintiff and defendant were neighbours in Florence Villa, Fowey, the front of those villas there was a narrow strip of garden where the defendant (who was the joint tenant with the plaintiff under a lease) had erected a summer-house which, it was alleged, obstructed the plaintiff's view of the harbour.

In the result, his Lordship refused to make any order on the motion, except that the costs should be costs in the action.

IMPORTANT ACTION AGAINST A GAS COMPANY AND CONTRACTORS.

THE case of Jordon v. the Sutton Southcoates and Drypool Gas Company and others was an action which has occupied the attention of Mr. Justice North in the Chancery Division for several days, it being an action brought by the plaintiff with respect of injury to some small houses belonging to him during the construction of a large gasholder close to such houses, and of prospective obstruction of access of light to the windows of such houses. Although the houses were of a poor class, being let to weekly tenants, the case raised important points of law as to the right of a person to abstract water, or water and silt, by works on his own land from a sub-stratum of his neighbour's land and so let down the surface to the injury of buildings thereon. The material facts were as follows:—The plaintiff is the owner of some twenty-four cottages in Hull which adjoined the premises of the defendant company. In July, 1896, the gas company, through their contractors, Messrs. Holme & King (also defendants), began to excavate for the purpose of constructing a sunk gasholder tank in which to receive and seal with water a very large telescopic gasholder, intended to rise when fully inflated to over 100 ft. above the ground level. The circular tank, which the contractors made to build the enclosing wall of the tank was only a few feet from the back wall of the nearest cottage. The trench was carried down to a depth of about 30 ft., and the work had to be carried through a variety of strata, one of which, called silt, was very difficult to deal with. This stratum, about 6 ft. 6 in. thick, was immediately followed by a thin layer of soft clay, and below that there was a firm basis of impermeable gault clay. The plaintiff's case was that cracks on his land and in his cottages had occurred through subsidence caused by the withdrawal of water and sand in suspension from the running silt bed; he further alleged that the contractors had not adopted the best known methods of damming back the water and silt during the operation of constructing the tank, and therefore they had been guilty of negligence. On this part of the case his Lordship heard a mass of contradictory expert evidence as to what the best mode of making an effective dam was. Another question of importance was whether, on the construction of the company's special Acts, coupled with the incorporated Gas Clauses Acts, the case was within the decision of "The Metropolitan Asylums Board v. Hill," in which the House of Lords held that the plaintiffs could be restrained from erecting a small-pox hospital on land bought for the purpose in a residential neighbourhood; or a later decision of the House of Lords in the case of "The London and Brighton Railway Company v. Truman," in which it was decided that the railway company were entitled to use land bought under power to purchase additional land by voluntary agreement for cattle sidings and yards to the annoyance of the inhabitants of a residential district at Croydon. The defendants in the present case contended that they had a common law right to remove water even if in doing so they abstracted matter in solution, and that any damage caused to neighbouring property was not actionable. Another contention was that the subsidence which took place was due entirely to the abstraction of water alone, and

that no appreciable subsoil had been abstracted. The defendant company also contended that they were given powers for public purposes, coupled with a duty to supply gas, which could only be fulfilled by the construction of the gasholder in question, and that, apart from the question of negligence in doing the work, they were entitled to interfere to the extent they had done, and proposed to interfere, with the rights the plaintiff would otherwise have had.

Mr. W. H. Upjohn, Q.C., and Mr. Dighton Pollock were counsel for the plaintiff; Mr. Haldane, Q.C., the Hon. C. Macnaghten, Q.C., and Mr. Boon for the Gas Company; and Mr. Rawlins, Q.C., and Mr. Heckscher for Messrs. Holme & King, the contractors.

Mr. Justice North, on the 15th inst., the arguments of counsel having concluded, said there were certain points in the case upon which he proposed to reserve his judgment, as they were questions of law. There were, however, questions of fact which had been gone into at great length, and which had better be disposed of while they were fresh in his memory. The first was as to the question of light. He had not the least doubt whatever that there would be a very considerable interference with the light of the plaintiff's cottages if the gasholder were carried to its full height. If he found in favour of the defendants on the whole case, he should deduct from their costs any costs raised on the issue of light, because they had failed on this point. The other question of fact had reference to the subsidence, and on this point he found that the defendants' work had been carried out carefully and skillfully; that there was no negligence, and that the plan adopted was the best.

His Lordship was therefore reserved on the questions of law only.

LETTING UNCERTIFIED BUILDINGS.

AT the Second Court of the Sheffield City Police on the 8th inst., before Mr. W. Chesterton and Alderman W. R. Carter, Mr. T. H. Cuckson, builder, 148, Bradley-street, was summoned for allowing two houses, Nos. 87 and 89, Eldon-street, to be occupied before obtaining certificates of fitness from the City Surveyor. Mr. W. S. Collingwood, of the Town Clerk's Department, who prosecuted, said the proceedings were taken under Section 74 of the Sheffield Corporation Act of 1890, and charged defendant with having allowed two houses to be occupied without having obtained the certificates of fitness. Mr. Cuckson knew the building regulations very well. The majority of the builders gave the City Surveyor no difficulty, but some gave a great deal of trouble. The custom was, when a building was completed for the builder to send a notice to the City Surveyor, who inspected the building within fourteen days. If anything was found wanting the inspector pointed it out, and until the matters were put right he withheld the certificate of fitness. Mr. Cuckson gave notice to the City Surveyor's Department with regard to these two houses, and they were inspected on December 6. The inspector found that there was no proper water supply, and the drains were not connected with the sewer. He pointed these things out, and when he went afterwards he found that one of the houses was occupied.—Mr. A. J. Dickinson, building inspector, said when he inspected the houses the water supply was not laid on, and the drains were not connected with the sewer. When he inspected them on December 14 he found that they were just making the connection with the sewer, and the men from the water department were just putting the water in. The water installation was not completed until December 20, whilst two of the houses were occupied. Defendant said he gave the people the keys in order to let them clean the houses, and they got their furniture into the houses without his consent.—The Chairman said defendant was a professional builder, and should have known better. He would be fined 1l. and costs in each case.

MEETINGS.

FRIDAY, FEBRUARY 18.

Incorporated Association of Municipal and County Engineers.—Metropolitan District meeting, to be held at the Offices of the Institution of Civil Engineers, Westminster. 7.30 p.m.

SATURDAY, FEBRUARY 19.

Sanitary Inspector Association.—Annual Dinner, King's Hall, Holloway Restaurant. 8.30 p.m.
Architectural Association of Ireland.—Special Visit to the Science and Art Museum, Kildare-street. 2.30 p.m.

MONDAY, FEBRUARY 21.

Royal Institute of British Architects.—Mr. J. Taverer Perry on "The Medieval Campanile at Rome." 8 p.m.

Surveyors' Institution.—Mr. T. W. Wheeler, Q.C., on "Legal Liability for Professional Opinion." 8 p.m.

Carpenters' Hall, London.—Lecture on "Lectures on Matters connected with Building."—Professor Sylvanus P. Thompson on "Electric Motive Power," with experiments. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Hugh Stannus on "The Principles of Design in Form." II. 8 p.m.

Sanitary Institute.—Dr. Louis Parkes on "Blots in our System of Sanitary Administration: Why Epidemics occur." 8 p.m. The Lecture is an introduction to the twenty-fifth Course of Lectures and Practical Demonstrations in Sanitary Science for Sanitary Officers and Students.

Liverpool Architectural Society.—Paper by Mr. E. P. Edwards, entitled "Notes on St. George's Hall," at 8 p.m. Illustrations.

TUESDAY, FEBRUARY 22.
Institution of Civil Engineers.—Dr. Jean Paul Richter on "Some Italian Pictures at the National Gallery." III. 3 p.m.
Society of Arts (Applied Section).—Mr. Cyril Aspinwall on "The Regalia of England." 8 p.m.
Antiquaries' Institute.—Mr. W. Roland Peck on Furniture: Past and Present. 8 p.m.
Royal Victoria Hall, Waterloo-road, S.E.—Miss Routledge on "Old London." 8.30 p.m.
Leeds and Yorkshire Architectural Society.—Discussion evening. 7.30 p.m.
Architectural Association of Ireland.—Mr. Cecil Orr on "The History of Architecture." II. 8 p.m.

WEDNESDAY, FEBRUARY 23.
Architectural Association: Discussion Section.—Mr. L. Marks on "Correct Principles of House Planning."

THURSDAY, FEBRUARY 24.
Society for the Encouragement of the Fine Arts.—Mr. H. Evans on "Wells Cathedral." Linelight illustrations. 8 p.m.
Society of Antiquaries.—8.30 p.m.
Antiquaries' Institute.—Dr. Jean Paul Richter on "Some Italian Pictures at the National Gallery." III. 3 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. H. Manley on "Sanitary Law: English, Scotch, and the General Principles of Public Health Act, 1875; by Dr. By-Laws, &c." 8 p.m.
Institution of Electrical Engineers.—Mr. G. Binsanger on "The Manufacture of Lamps and other apparatus for incandescence." 8 p.m.
Northern Architectural Association (The Students' Sketching Club).—Annual Social Gathering: the Grand Assembly Rooms, Barras Bridge. The prize drawings made by the Institute will be on view, also other drawings. The President, Mr. Frank W. Rich, will open the proceedings at 8 p.m.

FRIDAY, FEBRUARY 25.
Architectural Association.—Mr. F. W. Troup on "Leads, Work, Plain and Decorative" (with practical demonstrations). 7.30 p.m.
Royal Institution.—Captain Abney on "The Scientific Principles of Modern Colour Photography." 9 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. C. E. Wolf on "The Problem of Train Resistance." 8 p.m.

SATURDAY, FEBRUARY 26.
Sanitary Institute (Demonstrations for Sanitary Officers).—8 p.m.
Builders' Foremen and Clerks of Works Institution.—Annual Dinner, King's Hall, Holborn Restaurant. 6 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until March 26.

[1895] 29,212.—**CEMENT: Petrifite, Limited.**—Magnesian chloride (about 30 per cent. by weight) is boiled with water for about nine hours. After it is cooled, the mass is finely ground, and with the powder are mixed finely powdered magnesia (about 60 per cent. by weight) and a powdered lead salt—say, lead acetate (about 5 per cent. by weight).

[1897] 3,810.—**TRACING-LINEN, OR CLOTH, &c.**—*Sackville & Co. Swallow.*—The fabric is passed around a rubber roller similar covers "bowl" applying the size, colour, or fluid matter by an engraved roller, pressing the size or colour into the fabric by a thin plate, and passing it on to the drying cylinder—thus the effect of "lapping," "blanketing," and "backgreys" are dispensed with, being replaced by a "pad" roller, which rolls "low" and "doctor" or scraper, which presses the colour or size into the pores of the fabric as it comes from between the cylinder and "pad" roller.

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vance consists of a box having horizontal openings equal in number to that of the floors, and a band-rotating prism behind each opening, which has as many faces as there are separate apartments on that floor—the tenants' names are placed upon the faces of the prism.

7,945.—**LOCKER AND LATCH: H. D. Bailey.**—The handle's rotary movement is transmitted to a sliding bar by a lever which has two or more arms secured to the spindle. The bar is connected with the bolt either directly or through the medium of a coin inserted in the lock or latch.

13,591.—**EMBOSSED RAISED PAPER FOR WALLS, &c.: J. Holden & Co.**—For this is employed a certain sponge paper (Jasper's Patent, 2,495—1893) which is joined with ordinary paper as it passes along the paper-making machine; the duplex material is then embossed with the pattern; the raised paper can be made with or without "scrim" or threads.

21,465.—**LOCKER AND THE LIKE: A. Stenstrom.**—The locks have two shanks, connected by pivots, to clasp or hold the lock mechanism, placed between the shanks, consist of two or more springs projecting from one shank on the free end of which are clutches which, when the shanks are pressed together, can enter between the projections on the opposite shank; one of these by means of a lever carries the clutches by the clutches, so that the lock can be opened only by a key of form of the clutches.

25,797.—**MOULDING BRICKS, TILES, &c.: D. Black.**—The machine comprises a wheel rotating within a stationary casing, upon a horizontal stationary axle, and having moulds or pockets on its periphery, plungers on their bottoms give the desired pressure and eject the moulded bricks or tiles from the shafts. The tops of the moulds are formed by pallet or delivering boards led into the moulds carried round by the wheel in contact with the casing; also the combination of a race or hopper from which the pallet boards are fed into the moulds; and the arrangement of a scraper or "doctor," adapted, during the mould-wheel's rotation, to be lowered into, or raised out of, the moulds or pockets by the action of projections in the wheel upon bell-crank levers or threads.

27,037.—**MOULDERS' PATTERNS: C. Leuchter.**—On the inner side of a disc are points which engage in the wood of the pattern; a disk, having points on its lower edge, is held fast in the pattern by a central screw, which also has points for penetrating the wood; also a releasable handle, for use with the foregoing contrivance, having a holding-bolt with a wingnut. The bolt engages in a hole in the box, held firmly in the pattern by the central screw.

29,775.—**FENCE POSTS: B. G. Bracey.**—A terra-cotta cylinder formed with radial ribs and with a central core is inserted into the soil; the fence post is a metallic plate bent at its centre to a right-angle, forming an angle-bar which fits into the cylinder's core and is held in position by the edges abutting against the sides of the opening.

29,909.—**STONE-BREAKING AND ORE-CRUSHING MACHINES: W. H. Baxter.**—The machine—crushing-jaw is actuated by a central rocking arm or lever, between toggles; the toggles are placed at a point above the jaw on which the lever moves, from the back of the crushing-jaw, at a point below its connection with the toggles, extends a rod connected to the lower end of a double-ended vertical lever pivoted to a beam fixed transversely to the framework of the machine; a second rod, joined to the lower end of the rocking lever, is adjustably connected with the double-ended lever's upper end; the two rods transmit the return motion to the crushing-jaw (or movable jaw-stock). The inventor points out that hitherto all the strain both before and during the passage of the rock or crust for the crushing operation has been on or below the centre or axis upon which the central rocking-lever works.

NEW APPLICATIONS.

For week ending February 5.

2,430. W. Bevan, A Window-wedge. 2,440. W. Besselmann, Metal-shearing Machine. 2,444. Vendons, Purification of Gas. 2,446. F. W. Haywood, Water-gauge. 2,449. J. Kempter, Gradometer Hand-level. 2,471. C. F. Kite, Hot-air Ventilating Stoves. 2,475. C. P. Kinell, a Sanitary Hospital Ventilating Radiator. 2,483. Shorey and Others, Glass Broom. 2,485. C. Oliver Electric Air Lamps. 2,490. J. T. Seck, Plastic Compositions for Tiles, Plates, and Blocks—for Walls, Floors, Ceilings, &c. 2,491. I. Silverman, Locks and Keys. 2,496. A. R. Verrier, Screwing Apparatus. 2,505. R. Dahmann, Automobile Wood Screw-cutting Machines. 2,524. W. Brookes, Combined Revolving Ratchet Braces and Spanners. 2,526. Bennett & Kossig, Drawing Instruments. 2,527. W. C. Massier, Dustless Cinder Sifter. 2,530. Thom & Anderson, Binding Rotary Grinding and Polishing Tools. 2,531. W. Curbstone, Glazing Bars. 2,541. W. C. Piper, a Power Mortising Machine. 2,548. Singer Manufacturing Company, Blade Grinders. 2,556. W. Buckley, Lathe Driving Gear. 2,558. W. Saint, Furnaces or Destroctors. 2,566. Hall & Gowdy, Automatic Lathes. 2,567. Hammond & Flint, Solder and Flux for Aluminium. 2,569. Kathleen Vickers, Impression Wood-panelling. 2,577. C. A. Bailey, Pipe-threading Implements. 2,578. W. A. La Fave, and 2,583. Florence Carman, Disinfecting Apparatus. 2,586. W. Jones, a Fire Escape and Lifting Ladder. 2,590. F. Birch, Folding Ladders. 2,594. V. Royle, Bevelling Machines. 2,604. J. W. Suetterli, Automatic Distributing Nozzles. 2,613. J. S. Williams, Devices for Washing, Cleaning or Dusting Windows, Ceilings, Chimneys, Floors, &c. 2,634. G. Heath, Railway Platform and other Lamps. 2,647. Swinburns, and 2,660. H. Kamp, Cocks, Taps, and Valves. 2,676. C. B. Horrell, for Grouping Metallic Tubes or Rods. 2,683. J. Ogletrother, a Combined Safety Hook and Rope Shackle. 2,686. E. Dresen, a Portable and Inodorous Water-closet. 2,697. H. Beach, Oil Cans. 2,702. Lomich and Others, Wax-wheels. 2,721. Deyuan & Arnold, Combination Tools. 2,723. J. Reid, 2,834. C. Swinden, and 2,866. H. Lane, Brushes. 2,719. L. Delaunay-Belleville, Pumping Apparatus and Compressors. 2,720. H. W. Ward, for Grouping Metallic Tubes or Rods. 2,725. J. Ogletrother, a Combined Safety Hook and Rope Shackle. 2,686. E. Dresen, a Portable and Inodorous Water-closet. 2,697. H. Beach, Oil Cans. 2,702. Lomich and Others, Wax-wheels. 2,721. Deyuan & Arnold, Combination Tools. 2,723. J. Reid, 2,834. C. Swinden, and 2,866. H. Lane, Brushes. 2,719. L. Delaunay-Belleville, Pumping Apparatus and Compressors. 2,720. H. W. Ward, for Grouping Metallic Tubes or Rods. 2,725. J. Ogletrother, a Combined Safety Hook and Rope Shackle. 2,686. E. Dresen, a Portable and Inodorous Water-closet. 2,697. H. Beach, Oil Cans. 2,702. Lomich and Others, Wax-wheels. 2,721. Deyuan & Arnold, Combination Tools. 2,723. J. Reid, 2,834. C. Swinden, and 2,866. H. Lane, Brushes. 2,719. L. 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COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Prizes.	Designs to be delivered.
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*Public Baths	Winchester Corp.	250. First and 150. Second	Mar. 31
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CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Wood Pavine Works	Mile End Guardians	C. F. Burden, Workhouse, Bancroft-road, E.C.	Feb. 21
*Repairs at Workhouse and Smith's Work	do.	do.	do.
Sewage Works, Rodington, Notts.	Bastard R.D.C.	H. Walker, Engr. Newcastle-square Nottingham	do.
Additions to Railway Station, Lurgan, Ireland	G.N. Ry. Co. (Ireland)	T. Morrison, Amiens-st. Tinsbury Dublin	Feb. 22
Additions to Workhouse	do.	Young & Mackenzie, Archt. 7, Donegal-square East, Belfast	do.
*Road Works, St. Mark's-road, Lower Sydenham	Lewisham B. of W.	E. Wright, Lewisham Town Hall, Catford, S.E.	do.
*Paving Works, Glen View-road, Lewisham	do.	do.	do.
*Wood Paving Works	do.	do.	do.
Warehouses, &c. Cleuth House Mills, Huddersfield	do.	H. M. Malt, Town Hall, Manchester	do.
Water Supply, Old Park	do.	K. K. & Sons, Archt. 1, St. James's, West. Water Office, Belfast	do.
Additions to Schools	Rusham U.D. Sch. Bd	A. Hewitt, Archt. 15, King-st. Great Yarmouth	Feb. 23
Additions to No. 20, Greenlands, Kendal	do.	S. Shaw, Archt. Kendal	do.
Three Shops and Houses, Kirkland, Kendal	do.	J. Stalker, Archt. Kendal	do.
House, Eskdale, near Lancaster	do.	Vickers, Son, & Martin, Ltd.	do.
Additions to Factory, Fletcher-street, Workington	do.	P. B. Partridge, Engr. Victoria-bridge, Workington	do.
Rathenware Pipe Sewer, Thuram Hall-lane	do.	R. & B. Scott, C.R. Town Hall, Belfast	do.
Additions to School, Grange-road	do.	J. M. Bottomley, Archt. 25, Albert-st. Middleborough	do.
*Works and Materials	Hackney Vestry	J. Lovegrove, Town Hall, Hackney	do.
Road Metal, &c.	Barnet U.D.C.	Borough Survey Municipal Offices	Feb. 24
Severing, Draining, &c. Crockett-rd. and several others	Westington U.D.C.	G. E. Newton, Engr. Market-place, Weston	do.
Pipe Sewers, Mount Pleasant	Denton (Lancs.) U.D.C.	A. C. Torley, C.E. Works Hall, Eccles	do.
Concrete Sewer, &c.	do.	R. F. Hooley, Shire Hall, Bolton	do.
Granite Slag, &c.	do.	J. Galliey, Bury, Park-terrace, Annan, N.B.	do.
Road Metal, Annan	do.	Mr. Bower, Bury, Old Cottage, Berwick	do.
Road Works, Berwick	do.	J. Forrester, Bury, Thistle, near Reading	do.
Warehouses, Clifton Mills, Ballifry, Bridge, Yorks.	do.	J. P. Walsh, Archt. 1, E. Y. Bank-bridge, Halifax	do.
Brewery and Offices, Victoria-square, Halesley	do.	R. Barver & Sons, Archt. 1, Victoria-square, Halesley	do.
Additions to Schools, Farwell	do.	W. H. Haskins, Archt. 1, Branch-road, Halesley	do.
Additions to Church, Marston, near Huddersfield	do.	J. Kirk & Sons, Archt. Dewbury	do.
Beverage Works, Paynter	Conway R.D.C.	Conway	Feb. 25
Memorial Church, Placard, Elgin, N.B.	do.	Edgill	do.
School, Wesleyan Reform Chapel, Mountain, Queensbury, Yorks.	do.	H. Hodgson, Archt. Old Bank-chambers, Bradford City Surveyor, 28, St. Margaret-st.	do.
Electricity Station, &c.	do.	D. Rose, Bury, Glebe-st. Kirtlington, N.B.	Feb. 26
Stone Bridge over South Esk, Clava ..	Forfar Dist. Committee ..	R. Rose, Bury, Glebe-st. Kirtlington, N.B.	do.
Six Cottages at Asylum, Cupar, N.B.	do.	W. G. Scott & Co. Archt. Victoria-bridge, Workington ..	do.
House, Belle Isle-street, Workington ..	do.	S. Shaw, D.E. Dewbury 15, Greenhalgh, Archt. 15, Bolton Union	do.
Pine Sews, &c. near Leeds	do.	J. Stalker, Archt. Kendal ..	do.
Additions to Workhouse, &c.	do.	J. W. S. Bartlett, Bury, Pennine, Bridport ..	do.
Shop and House, Chapel Close, Beas, Rensley, Kendal	do.	J. Davies, Leighton House, Penryn, Landisville ..	do.
Road Works, Bridport, Dorset	do.	W. Sheppard, Bury, Tow-terrace ..	do.
Road Materials	do.	G. J. Oliver, Archt. 1, Lower-street, Carlisle ..	do.
Public Hall, Kirkpatrick Fleming, N.B.	do.	J. Mansfield, & Victoria-street, S.W.	do.
*Oil Engine, &c. Pump	do.	R. W. Cass, Bury, Parham, Surrey ..	do.
*Crushed Granite or Granite Screwing ..	do.	do.	do.
*Laying-out Site and Erecting Buildings, Pavilion, &c.	do.	do.	do.
8 Roads (Fries), Banger, N. Wales ..	do.	do.	do.
Enlarging Convalescent Home, Moretonhampstead	do.	do.	do.
Additions to School	do.	do.	do.
Additions to Asylum, Devone-road, Brunley	do.	do.	do.
Street Works, the Point	do.	do.	do.
Additions to Institution, Victoria-street, Windsor	do.	do.	do.
Sanatorium, Banger, &c. Great Malvern	do.	do.	do.
*Road Materials, Watling & Cartage ..	do.	do.	do.
*Hops and Sheds	do.	do.	do.
*Paving, &c.	do.	do.	do.
*Paving, &c.	do.	do.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Well and Heading Engine, Pump House	Deesborough U.D.C.	J. E. Eversard, 6, Millstone-lane, Leicester	Mar. 1
*Engine Shed, Coalbrookdale, &c. Blaydon-on-Tyne	N.E. Ry. Co.	W. Bell, Central Station, Newcastle-on-Tyne	Mar. 2
*New Wing, Pier Head, and Refraining and Waiting Rooms	Southdown Sea Corp.	A. Piller, Bury, Eng.	do.
*Making Up and Paving Road	Salham Vestry	C. Bitterell, Vestry Hall, Walsham Green	do.
Pipe Sewer	King's Lynn Corp.	P. W. Ricketts, C.R. King's Lynn	do.
Main Sewer, Alexandra Park	Oldham Corp.	S. A. Pinner, C.R. Oldham	do.
Alterations to Museum	Norwich Union	J. B. Pearce, Bury 15, Upper Kings, Norwich	do.
*Iron and Pipe Sews	Watford U.D.C.	Office, 14, High-street, Watford	do.
*Cast-iron Rocket Pipes	Ryde Corp.	C. Mathew, Town Hall, Ryde	do.
*Sub-Police Station, Worthing	County of W. Sussex	R. H. Hyde, Kriwell-road, Worthing	do.
Residence, near Galbally, Ireland	Mitchelstown Union	R. Fitzgibbon, The Work-house, Mitchelstown	Mar. 3
Road Materials	Brissworth R.D.C.	W. C. Woodford, 18, Market-street, Northampton ..	do.
Two Schools (and Addition), Old-road, St. Paul's	Llanelli Sch. Bd.	W. C. Woodford, 18, Market-street, Northampton ..	do.
Church, Gortin, co. Tyrone	do.	Llanelli Sch. Bd.	do.
Villa, Greenyard Estate, Skidroad, Haverhill, Bedfordshire	Salford Corp.	G. Buckley & Son, Archt. 1, Haverhill, Bedfordshire ..	Mar. 4
Bridge Abutments, &c.	do.	do.	do.
*Sewerage Materials, Maidstone	do.	do.	do.
*Erecting a Building at Post Office, Birmingham	Commrs. H. M. Works	do.	do.
*Various Materials	Barnesbury Vestry	Vestry Clerk, Spad. S.E.	Mar. 5
*Driving Road Hole	do.	do.	do.
*Fire Engine Station, Lewisham	London County Council ..	do.	do.
Villa, Skidroad Green-road, Halifax ..	do.	do.	do.
*Technical Institute	Norwich Corp.	do.	do.
*Buildings, Walling, &c.	Dartford Union	do.	do.
*Articles, Works, &c.	Rotherhithe Vestry	do.	do.
*Erection of Superstructure of Asylum with Offices, &c.	County Borough West Ham ..	do.	do.
*Electricity Works	Watford U.D.C.	do.	Mar. 11
*Quarrying Granite, also Cartage of Granite	Middlesex C.C.	do.	do.
*Infringement Works and Buildings ..	do.	do.	do.
*Works and Materials (various)	do.	do.	do.
Beller House, &c. Bradford	do.	do.	do.
Two Houses, Victoria Park Estate, Huddersfield	do.	do.	do.
Offices, Albert-chambers, Harrogate ..	J. Smeetham	do.	do.
Alterations, &c. to Premises, Highgate, Kent	do.	do.	do.
Cottages, Barton Close, St. Cross, &c.	do.	do.	do.
Hall, Clarence-road, Newport, I.W.	do.	do.	do.
Several Houses, Wood Lost, Belfast ..	do.	do.	do.
Pipe Sewers, Woodhouse-rd. Kestley	do.	do.	do.
Fire-alike Refractors, &c.	Chorley Corp.	do.	do.
Additions to Boyle Hall, West Ardara	do.	do.	do.
Stone Church, Saville Town, Dewsbury ..	do.	do.	do.
*Club Premises	do.	do.	do.
*Steam Main, Valves, Pumps, &c.	W. Riding C.C.	do.	do.
Detached Residence, Gosforth	do.	do.	do.
*Two Houses, Herby Bay	do.	do.	do.
Additions to Church, Ashington	do.	do.	do.
Cottage Homes, Middlewood, nr. Wakefield	do.	do.	do.
Shop Premises, Yorkshire-street, Wakefield	do.	do.	do.
House, Westmore, West Kenton	do.	do.	do.
Two Houses, Oakley-road, Redditch ..	do.	do.	do.
Store and Three Houses, Mills Hill ..	do.	do.	do.
Granite and Slag	do.	do.	do.
Church, Elyrn, nr. Llangatlock	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be in
*Assistant Superintendent for Sewage Works	Willesden U.D.C.	27. per week and residence	Feb. 19
*Building Inspector & Drains Inspector ..	County Borough Croydon ..	50s. per week rising to 60s.	Mar. 1
*Surveyor	St. Marylebone Vestry ..	600l. per annum	Mar. 1
*Assistant Surveyor	do.	1200l. per annum	do.
*District Superintendent	do.	1200l. per annum	do.

Those marked with an asterisk (*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv. vi. vii. viii. & ix. Public Appointments, pp. xix. & xxi.

ASCOT (Berks).—For additions to "Station" Hotel, Mr. S. Johns, architect, Wallingford.—	Hotel.
W. Satchwell	£257
C. H. Churms	725
W. Watson, Ascot	754

Hotel and Stables, &c.	Hotel.	Stables.	Total.
W. Watson	£784	£100	£884
J. Buckel	725	254	£979
C. H. Churms	725	300	£1,025
W. Satchwell	927		
J. Trust	649		

* Accepted.

BLEATARN.—For works in connection with the Bleatarn water supply, for the East Westmoreland Rural District Council. Messrs. G. Watson & Son, engineers, 3 St. Andrew's-place, Penrith.	Scott & Dent	£388 0 4
do.	W. Bowditch	350 0 0
do.	W. Taylor	350 0 0

* Accepted.

BRANCEPETH (Durham).—For the construction of a Cosham's patent sewage precipitation tank, with catchpit, baffling chamber, filter and outlet pipes, troughed, and fence around the same, at Brancepeth Village, for the Durham Rural District Council. Messrs. Geo. Watson & Son, engineers, 3 St. Andrew's-place, Penrith.	Brancepeth	£1,000 0 0
do.	W. Bowditch	350 0 0
do.	W. Taylor	350 0 0

* Accepted.

BRISTOL.—For the erection of chapel, &c. Jacob's W. Clifton, for the trustees, Mr. A. R. F. Frew, architect, 23, Broad-street, Bristol. Quantities by Mr. Wm. Veals, St. Stephen's-avenue, Bristol.	Chapel and School.	New Repair.
E. Love	£1,110 0 0	£24 0 0
A. L. Dowling	1,175 0 0	33 0 0
L. Thomas & Son	1,610 0 0	130 10 0
Edwin Walters	1,920 0 0	17 5 0
Edwin Clark	2,390 0 0	13 0 0
Hughes & Weeks	2,515 0 0	15 0 0
Thos. Lovell & Son	2,445 0 0	9 5 0
J. B. Davis	1,430 0 0	12 0 0
Geo. Elmes, Bedminster (accepted)	1,495 0 0	72 0 0

This Asphalte was chosen to be
laid at Sandringham, on the new
General Post Office, and other
important buildings.

BRISTOL:
ASHTON GATE WORKS, CORONATION-BL

The Builder.

VOL. LXXIV. No. 2875.

FEB. 26, 1898.

ILLUSTRATIONS.

New Reredos, Bristol Cathedral.—Designed by the late J. L. Pearson, R.A.	Double-Page Ink-Photo.
"Heathfield Park," Sussex: as altered and enlarged.—Mr. Reginald Blomfield, Architect	Single-Page Tint Block.
"Kingswood," Sydenham Hill: as altered and enlarged.—By Mr. H. V. Lanchester, A.R.I.B.A., Architect	Single-Page Tint Block.
Design for a Small Country Church.—By Mr. Charles E. Vandell	Two Double-Page Photo-Lithos.

Blocks in Text.

Plans through Cornice Course, North-west Turret.....	Page 199	"Heathfield Park".....	Page 208
Diagrams illustrating the Students' Column.....	Page 212		

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A German Treatise on Hospitals.



TRULY art is long and life is short. The volume before us* occupies 969 quarto pages—a large proportion of it being printed in very small type—and yet it is only the

first part of the fifth division of the fourth portion of what is styled (with a touch possibly of sarcastic humour) a "Hand-book of Architecture."

Professor Kuhn's work divides itself into two portions. One-third of the book, roughly speaking, is occupied with a remarkably full history of the development of the hospital system from the earliest times; the remainder is devoted to the practical questions arising in the consideration of modern hospital planning, construction, and arrangement. Each portion is judiciously divided into chapters and sections, and there is a good table of contents, so that it is possible to turn to any part that may be desired without loss of time; it would, perhaps, have been advisable to have provided an index as well, as reference to the numerous minute points raised and discussed throughout the volume would thereby have greatly been facilitated.

The history of hospitals, according to Professor Kuhn, commences with the Buddhists. An inscription of the indefatigable King Asoka (quoted by our author at length), remains to tell us of the foundation of an institution of this nature in the third century B.C. After briefly sojourning in India we are led by our author to Persia, thence make a sudden and short flight to Ancient Mexico, returning by way of Greece and Rome to the Holy Land. In the case of each country Professor Kuhn gives the evidence for or against the existence of hospitals in early times. He then proceeds to discuss at great length and fulness the development of hospitals under the influence of Christianity—the influence to which the credit of the existence of these charities is,

* "Handbuch der Architectur: vierter Theil: Entwerfen, Anlage, und Einrichtung der Gebäude." 10ten Halb-Band, 10ten Heft. Krankenhäuser, von Professor Oswald Kuhn in Berlin. Stuttgart, 1897. Price 9 marks (2s. 2s. 6d.).

of course, mainly due—commencing from the Xenodocheion of the primitive period. The history is traced by the Professor through the monastic hospitals of the Early Middle Ages (with an excursus on the Monastic Orders which especially devoted themselves to the care of the sick and aged) to the gradual emancipation of these institutions from their identity with collegiate establishments in the twelfth-fourteenth centuries. Each stage of the history, as it comes under discussion, is exhaustively treated, and no difficulty is shirked. A short notice of Lazar-houses, and a brief recapitulation concludes this extremely interesting chapter in evolution. The hospitals of the Renaissance period occupy Professor Kuhn's attention in his second chapter, those of the eighteenth century in his third. In the latter, as it is the commencement of the modern period, the treatment is naturally rather fuller, and the author divides his subject for convenience' sake into sub-headings—Hospitals for General Purposes, Hospitals for Special Complaints, Military Hospitals, and Hospitals for Infectious Diseases. This division forms the basis of the classification adopted throughout the rest of the volume. It is impossible to summarise these chapters, seeing that they principally consist of mutually independent facts relating to the foundation of the chief hospitals dating from this period, with the individual history of each. We need say only that the whole of the civilised world in both hemispheres has been laid under contribution. Indeed, were it possible within the limits of our space to give a summary of these chapters, it would be of little practical value to readers of the *Builder*.

The fourth chapter enters, at enormous length (pages 129-310, nearly all in small type), on the subject of hospitals and their development during the present century. We can best give, in a brief space, some idea of the truly national thoroughness displayed by Professor Kuhn, by a short abstract of one section of this part of his work. For this purpose we shall intentionally select one of the less lengthy sections. In describing the history of hospitals for children during the special period of forty years between 1825 and 1865, the author commences with the foundation of the "Charité" at Berlin in May, 1830, and gives a description of that institution.

Then in order of foundation follows Friedberg's Children's Hospital at St. Petersburg, in 1834; of this building an account is given also; the Children's Hospital at Vienna (1837) comes next, the stages of its history being detailed and its buildings described, with dimensions, accommodation, &c. This brings our author to the time at which Huegel wrote his "Beschreibung saemmtlicher Kinderheilstalten in Europa nebst einer Anleitung zur zweckmaessigen Organisation von Kinderkrankeninstituten." Professor Kuhn pauses at this point to abstract the main views and conclusions of this writer. Resuming his history of the foundation of independent institutions of the class under discussion, the Professor next treats of the various Paris hospitals for children in order of their dates; then the Great Ormond-street Hospital in London, and the Borchardt Hospital in Manchester, are mentioned, though they are not described at such length as are the Continental examples. The section ends with a very careful account of the Children's Hospital at Lisbon, with full dimensions; and an excellent bibliography. These bibliographies, we may here notice, are liberally interspersed among Professor Kuhn's pages, and form not the least important part of his work; many of the references are to articles which have appeared in the *Builder*.

Besides this section on children's hospitals from 1825 to 1865, of which we have given an outline, there are also accounts of military, general, children's, and isolation hospitals from 1800 to 1825, and isolation and military hospitals from 1825 to 1865. In the last a considerable amount of space is naturally devoted to the hospital arrangements adopted during the American Civil War and the War in the Crimea. The historical portion of the work being thus finished, Professor Kuhn takes up the larger, and, to the so-called "practical" man, the more important subject of the theory of modern hospital construction and management. He begins by elaborately tracing in detail the development of the modern principles of hospital arrangement from 1865 to the present day. The various experiments in dealing with patients and diseases of different classes, and the opinions of the leading medical authorities in all the civilised countries in the world, are set forth in order of date, so that it is possible

to follow out the various steps by which a gradual approximation to the system at present in use was obtained. That Professor Kuhn is competent to treat of the practical as well as the historical side of his subject is shown by the chapter which follows. This chapter, which occupies no less a space than pp. 343-662, contains everything that an architect commissioned to design a hospital should know about the details and requirements of hospital wards. It is the principal chapter in the book, and is divided into three portions: an account of the various departments of ward construction in their perfected form; a classification and description of the wards of permanent hospitals; and a similar classification of those of hospitals for temporary purposes. Here again it will be convenient to select one subsection, and by a brief abstract of its contents to illustrate Professor Kuhn's treatment of his subject as a whole.

In the first portion of this great chapter Professor Kuhn dissects the wards, and in turn takes up each of their details, which he treats independently and exhaustively. Their size and shape, their lighting, position, floors, walls, roofs, doors, windows, and other parts; their ventilation and heating; artificial light; subsidiary and accessory rooms; methods of access from one room or floor to another—corridors, steps, and lifts—and last, the ordering of the sick-room, are discussed one after another. In all these departments of his subject Professor Kuhn is quite up to date; the modern practice of building hospital wards with rounded corners between walls, and between walls and floor, as in the case of the Leeds Infirmary, is—to take one example out of many—duly mentioned.

As an instance of Professor Kuhn's thoroughness, we may give a short abstract of his section on windows. The first point considered is the position of the windows in the ward walls with respect to the beds. This must be so chosen that no draught falls on the beds whenever opposite windows happen to be opened; while on the other hand, a good and equable light must be secured for the purposes of medical examination. These and similar points are enlarged upon to the extent of a page and a quarter. The size of the windows has next to be considered. Here the opinions of several authorities, architectural and medical, as to the amount of light required in proportion to the superficial area of the floor, the cubic contents of the room, and the number of the beds, are brought together and tabulated; particulars being also given of these details in the case of the principal hospitals in the world. Then the nature of the window openings—the height that their sills should be from the floor, the side of the wall on which the frames should be, &c.—is examined. Professor Kuhn notes that the frames should be on the inside, not the outside, of the wall; or, if placed outside, that the internal sills should be rounded off, to prevent dust from settling as well as to keep them from being used as seats and shelves, that the proper opening of the window be not interfered with. A short section follows upon the object of ventilation by windows in addition to that provided by special ventilating apparatus—the special purpose of completely purifying the air when the weather permits them to be opened. Paragraphs follow upon miscellaneous points: the construction and

material, and the means of securing the greatest possible glass-surface; the quality of the glass that should be used; the kind of sash-fasteners that ought to be employed; the respective merits of single and double-glazed windows; and the various species of windows—sash, casement, and the rest—the merits and demerits of which, as well as particulars of the buildings in which each is used, are fully given. Into this discussion exigencies of space precludes our entering.

In the two sections at the conclusion of the chapter, Professor Kuhn, having considered the parts of a ward independently, proceeds to put them together to make the complete ideal sick-room. In the first of these, the wards of permanent hospitals are treated. These hospitals are classified into what Professor Kuhn calls "Pavilion Hospitals"—that is, those in which each story does not contain more than one ward, or at most two, in line, separated by the staircase, &c.; hospitals for infectious diseases; hospitals for special purposes—paying patients, convalescents, lunatics, &c., &c.—and separate buildings for watching doubtful cases. Each section is illustrated with a wealth of examples described and delineated in plan, section, and elevation; the sources of information followed by the author in collecting his illustrations are very varied—the *Builder* among the rest—and the buildings selected as examples are taken from all countries. Hospitals for temporary emergencies, military or epidemic, occupy the concluding section. These are treated in a similar manner. The chapter concludes with a portentous bibliography of the subject, covering nearly twelve pages of small type.

An English writer on a subject of this nature would probably—at great sacrifice of detail—have condensed his whole work into the limits of this single chapter; and people in this country are such specialists, that it would be difficult to find a writer like Professor Kuhn equally good as an antiquary and a "practical" man. However that may be, our author has not yet done with his subject. Two more chapters are to follow, filling 300 pages between them. The first of these is comparatively short, occupying fifty pages only, describing the various residential, official, sanitary, mortuary, and other essential apartments; in each the same untiring exactitude is to be found as in the rest of the book. The last chapter, in accordance with Professor Kuhn's method above adverted to, collects the results of the inquiry pursued in the two previous chapters, into the ideal hospital; with all necessary additional information as to choice and treatment of site, water supply, and so forth—the various recommendations as before, being strengthened by example as well as by precept.

That there should be occasional slips in detail (such as an error as to the relative position of Nottingham and Leeds) is only human; and the work as a whole is so admirable and exhaustive that it seems ungracious to find any fault with it. There are, however, two adverse criticisms that must be made. The first is the want of an index, to which we referred at the outset of this review. The second is the style of writing in which Professor Kuhn has clothed his matter. Insufficient attention has been paid to this important consideration, as is too often the case in German writings, with the result that the author's diction is obscure in

places, and the reader who derives pleasure from seeing a good work well done is deprived of the additional pleasure of seeing it artistically done as well. This criticism is written in full appreciation of the fact that in England this detail is just as completely neglected. The English style of the vast majority of technical text-books is nothing short of scandalous, and is in many cases a positive infliction to read. A great deal too much of that vilest of jargons, "Specification English," finds its way into print.

A reader interested in hospitals, and prepared to follow the elaborate ramifications of the subject through the liberal bibliographies provided for him in this great work, need never want for employment—his life-work lies before him.

THE REPAIR OF SALISBURY TOWER.



HE work of reparation and strengthening of the tower of Salisbury, which has been in progress for the last two and a half years under the superintendence of Sir Arthur Blomfield, is now practically completed, and the scaffolding will shortly be removed.

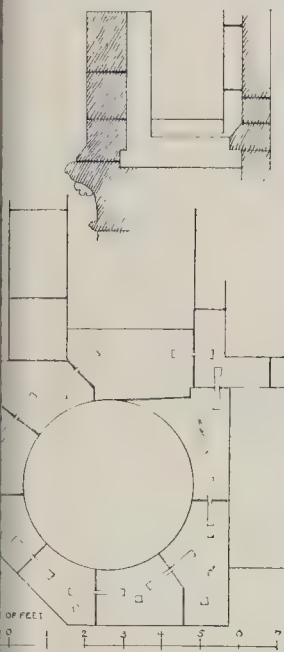
The work that has been done hardly comes under the heading of restoration, except in one or two portions of the tower where some decorative features have been partially renewed. For the most part it has been work of a purely practical kind, consisting in the replacing of decayed stones in such a manner as to renew the bond which had been destroyed or, in most cases, to provide a better and securer bond than the original builders had taken the trouble to make. The dangerous condition of the tower has not resulted so much from any settlement or any pushing out of the walls by the spire, as from the decay of a good deal of the stone and the weakening of the angles of the tower by the consequent disruption of the bond, which had left in some instances slits which could be seen through, between the angle buttress masonry and the body of the work. The masonry seems to have gone most in these positions; in some portions the height the general face of the walls is in very good condition, and the decay has mainly been in the angles and sides of the buttresses.

The work has been of a risky and difficult nature, requiring the greatest care and caution and has consisted in taking out one or two stones at a time and replacing them with new stones in longer lengths, and cutting away the back portion of the ancient masonry where it seemed necessary to insert a through stone to bond the whole together. The object throughout has been to get in new stones of as large bed as possible, so as to secure a strong bond; and the work at the angles seems now to promise at all events a long term of security to the tower. Some idea will be formed of the extent to which the stonework was decayed from the fact that in one portion of the work it was necessary to repair the cornice stones and finials above before proceeding with the insertion of new stones below, as the upper work would have been in danger of being shaken down during the latter operation.

The north-west main pinnacle was so completely decayed that it had to be demolished entirely and rebuilt; the original

is are at present collected in the build-
yard. The construction of this large
icle gave a curious illustration of the
going procedure of Mediæval masons,
e stones were simply backed together
ut a through bond of any kind, the
e line being a straight joint all the
up.

is another curious incident that these
icles, which appear from below to be
onal, and ought logically to be so, are
ality seven-sided, a design adopted
usly to save the labour on one out
eight angles. The mitreing of the



Through Cornice Course, North-west Turret.

e of gablets, at the angles, presents
some odd instances of "fudging,"
h however could not be noticed from
w except with a telescope. The fore-
tended view up the spire from the
ry at the base shows in a striking
ner its twisted form; one angle having
ite obvious convex curve, as if with the
tion of an entasis, while another angle
from the same point of view presents a
ectly straight line. The detail of the
er, when seen at close quarters on the
olding, does not present that massive
acter and vigour of sinking and relief
ch one finds, for instance, at Peterborough;
character of the work, as of that of the
le design of the Cathedral, being marked
legance rather than power.

esides the rebuilding of the north-west
acle, a considerable portion of the range of
ets below the upper stage of the tower has
n restored, and as this is not the inven-
on of any new feature, but merely the
statement of a portion of a decorative
ure which had decayed, it appears to be
ustifiable kind of restoration, on the
inciple that design counts for something
well as history. At the bases of these
ets were wolf-head bosses of which
a or two remain nearly perfect, and a
d many in a more or less dilapi-

dated state. Where the gablets have been
renewed the wolf-heads have also been
inserted as modern carving; these are
executed with a great deal of force and
vigour, and will probably tell well from
below. Whether it is well to insert this
modern carving in an ancient building is a
point which we admit is open to question.
As a matter of effect the tower will look the
better for them, in a general view. The
objection that they may in process of time
come to be confounded with original work
might be met by making a key elevation of
the work on this stage, colouring the
modern work as a record of what was done.

We give, by the architect's permission, a
reduction of one of the working drawings
showing how the stones of the cornice of
one of the turrets have been fixed with
dowels and copper cramps.

Mr. Thompson, of Peterborough, was the
contractor for the work, Mr. Tebbs acting as
clerk of works.

NOTES.

M. HENRI OMONT, of the
Bibliothèque Nationale, Paris,
has done to archaeology a long-
needed service. He has just published in a
splendid folio the drawings of the Parthenon
marbles, supposed to have been made by the
French artist, Carrey, and preserved in the
Bibliothèque. To these, already in part
reproduced in the Berlin Denkmäler, he
has added the curious plans and maps of
Athens made during the seventeenth
century by the Capucin monks. The
Capucins made their headquarters in
Athens, in the monument of Lysicrates
(1669). Their original plan was lost; but
an early copy made by Guilletière in
1675 for his "Athènes ancienne et nouvelle"
exists, and is here reproduced. It is a
remarkable fact, to which Dr. Dörpfeld has
already drawn attention (Mittheilungen,
1895, p. 510), that in this plan the Enneak-
rounos is marked as on the west slope of the
Acropolis; there is also marked the ruins of
a circular building, which the Padre Coronelli
named "Teatro di Baccho o Lenaio." This
seventeenth century evidence cannot be
ignored in the "Enneakrounos episode"
controversy, and M. Henri Omont has now
made accessible the material for its adequate
discussion. His book is published by
Leroux. It contains also the sketches made
by Cyriac of Ancona in 1435.

The Proposed
Kronstadt
Cathedral.

THE international competition
for the new Cathedral at Kron-
stadt has now been decided,
but the result has been unsatisfactory owing
to the first and second premiums not having
been awarded, and the third premium, which
was awarded to Mr. W. Ssussloff, of the
Russian Royal Academy, was for a design
which was not recommended for execution.
The competition was for a Cathedral in which
4,000 persons were to be accommodated, and
there were a considerable number of condi-
tions regarding the materials to be used and
the character of the design. The first pre-
mium was to be 5,000 roubles, the second 2,500,
and the third 1,500, but there was a curious
restriction that the first premium should only
be awarded to such design as was in every
way ready for immediate execution without
any alteration or modification whatsoever, and
it was on this account, *i.e.*, the fact of no
design being suitable for immediate execu-

tion without alteration, that the first two
premiums were not awarded. It may be
observed that, although the competition was
nominally an "international" one, we do
not hear of any but Russian competitors.

The Panthéon,
Paris.

ALTHOUGH the interior deco-
ration of the Panthéon was com-
menced twenty-five years ago
it is still far from being finished; and in
fact, for want of the necessary votes of funds,
the Fine Arts Department, which has the
work in hand, can only proceed very slowly.
Thus M. Falguère's "Liberté," which was
completed some months ago, has not yet
been cast, and only the plaster model has
been put up. On the other hand M. Mercié
and M. Dalou have not yet commenced the
execution of the groups of orators and
generals of the Revolution whose statues are
to decorate the central nave. In regard to
the paintings, M. Humbert has not com-
pleted his mural paintings, and M. Puvis de
Chavannes has not even commenced the
actual execution of the fine series of
frescoes, the cartoons for which were so
much admired at the last Champ-de-Mars
Salon. It is to be feared, therefore, that the
Panthéon will for a long time preserve the
cold and cheerless character which this
former temple of religion has assumed since
it was metamorphosed into a shrine of
national glories.

Saxon Remains
at Barton-on-
Humber.

To the eastward of the Saxon
tower of St. Peters, Barton-on-
Humber, the foundations of an
eastern extension, a chancel, have been
brought to light, certainly contemporary
with the tower. It measures internally
14 ft. 6 in. by 11 ft. 6 in., and has a square
eastern termination. The south-east quoin
of the foundation was found, as well as parts
of the north, south, and east sides of the
structure. Mr. Hodgson Fowler, who, with
Professor Baldwin Brown, examined the
remains, is preparing, we believe, a full
description of them.

Liskeard Church
Tower.

It appears that the Vicar and
his Committee have availed
themselves of the Borough
Surveyor's report, alleging further dilapi-
dation of Liskeard Church tower, to bring new
pressure to bear on the Chancellor, and that
they are about to apply formally for a second
faculty for rebuilding the tower on modified
plans. The Chancellor (Mr. Paul), while
still expressing an opinion that an effort
should be made to preserve the old tower,
has intimated that, "rather than allow any
discord prejudicial to the interests of the
church to continue," he would be willing to
grant a faculty to take down and rebuild
the tower as it stands with one stage
no more than 15 ft. in height added to
it, and a vestry; the Norman arch of the
tower to be preserved. If the Chancellor
meets the wishes of the Vicar and his
Committee as far as this, he will do well to
have his faculty made out in definite and
unmistakeable terms, and to have an in-
spection of the work kept up while it is in
progress, as it is obvious that the Vicar and
his party are determined to evade the faculty
and destroy the old tower if they can. The
Vicar stated, at the meeting at the Guildhall
on the 17th, that "in his opinion they were
not called upon to rebuild every stone of the
present fabric, but that they would be able

to put up a tower such as they would be proud of." That, in plain English, appears to mean that after obtaining a faculty for rebuilding the old tower he intends to evade its conditions.

THE directors of the Gas Light and Coke Company have declared their intention of raising

the price of gas to their consumers, although they already charge considerably more than either of the other two London companies. The Gas Light and Coke Company is by far the largest of the three companies, their Beckton works being the largest in the world, and it does appear remarkable that in a city like London, which has no district with a scarcity of gas consumers, that the largest gas manufacturers should charge the highest price. Mr. George Livesey, who is a shareholder in this company, in addition to being chairman of the South Metropolitan Gas Company, spoke very plainly at the last general meeting of the Gas Light and Coke Company. In effect he said that the present unsatisfactory condition of affairs was due mainly to mismanagement, and that it was high time that the present management resigned the reins to more competent hands. The proposed increase in the price of gas seems likely to meet with strong opposition from the consumers and local authorities concerned, and it will be interesting to learn what result outside influence can produce, taking into consideration the fact that the company are perfectly within their legal rights in raising the price, whether rendered necessary by mismanagement or otherwise.

ON Monday night, Professor Silvanus Thompson lectured on "Electro Motive Power" to a crowded audience at the Carpenters' Hall. Although the lecture was a popular one, yet by means of excellently designed models the lecturer managed to make clear such recondite subjects as polyphase apparatus and the transmission of power by three-phase currents. At the beginning of his lecture he gave a short history of the rise of central stations, and incidentally pointed out how the power station at Paddington, designed by the late Mr. J. E. H. Gordon, and which has been running for the last fifteen years, anticipated in many of its details the best modern practice. The alternators in this station are directly coupled to marine engines of a vertical pattern, and they are also fly-wheel alternators, having fixed armatures and rotating magnets. In addition, they supply two-phase currents, and this type of current is being adopted in the most recently designed American central stations. It is extraordinary, considering the many types of station plant that have been tried during the last fifteen years, that engineers should be reverting to the type of the first power-house in London. Professor Thompson gave many instances of the economy of replacing shafts and belts by electric motors. He stated emphatically that the electric lifts so much used in Germany and New York were much more economical than the hydraulic lifts generally used in London. The great progress that electric traction has made during the last ten years was well illustrated by stating that nearly ninety per cent. of the world's mileage of tramways (16,000 in 1897) was

worked electrically. Before many years he expected that all the heavy railways in this country would be worked electrically. Steam locomotives can manage sixty miles an hour, but for speeds of 120 miles an hour the electric locomotive is an absolute necessity. He was certain that in the future the hard work of the world would be done electrically.

Modern Methods in Ancient Bridges.

THE ancient saying that there is nothing new under the sun is illustrated in a paper by Professor Mehrrens, of Dresden, on "Ancient and Modern Bridge-building," published in the *Zeitschrift für Architektur und Ingenieurwesen*. The paper is a collection of noteworthy examples of bridges of all periods, with comments, and with twenty illustrations. It is sometimes supposed that suspension and cantilever bridges, if anything, may be considered the modern productions of civilised man; yet the Professor shows that "nature-folk" (to borrow the charming and convenient German expression) have anticipated both inventions. He illustrates a suspension bridge from the Caucasus, in which two accommodating trees take the place of the uprights, a rope of the chain, a few logs of the footway; and an ancient cantilever bridge from Japan, which differs from the modern examples chiefly in the fact that it is picturesque, while they are otherwise. The Chinese also made use, from a very early period, of the cantilever principle for bridges.

The Function of Trade Ornament.

IN the course of an excellent address at the conversazione and prize distribution of the Sheffield School of Art on Friday last week, Mr. Onslow Ford alluded in trenchant terms to the common use of bad ornament to cover up bad workmanship. He remarked that "because a thing was covered—or smothered—with bad ornament and sold at a cheap rate, the people bought it. It was a difficult thing to obtain a common article to-day with little decoration upon it. The cheaper it was the more it was covered with coarse decoration. This question was solved to him the other night by a manufacturer, who told him that the cheap articles had to be produced at such a quick rate and at so low a price that the covering of them with ornament served the purpose of hiding the defects of the construction underneath." That is just what we have been telling manufacturers for years past, at every opportunity; that bad ornament adds nothing whatever to the value of an article, but on the contrary detracts from it, and that a well-made plain thing is much better and of more value to all sensible people than one covered with bad ornament. At the same time it must be admitted that the majority of purchasers prefer the "ornamental" production, and the minority who know better have to suffer accordingly, both from the sight of the cheap ornament bought by other persons and placed in their houses, and from the practical impossibility of getting well-made plain articles for themselves.

Dorking Workhouse Infirmary Competition.

WE observe that in this competition, the result of which is reported under our usual heading on another page, the Guardians themselves selected ten out of a large number of designs sent in, and then, and not till then, called in a professional assessor to adjudicate

on these ten. This is a method of proceeding which ought to be protested against wherever it is adopted. It is a mere farce to in an assessor to adjudicate on a portion of the designs previously selected by the Committee. The assessor ought to see the whole. For all that the Committee know the designs which they have shut out from inspection may include one which he would have recommended; and whether it be so or not, the competitors have a right to expect that they shall all be treated on an equal footing, and that if a professional assessor called in he should see all the designs, not a selection of them.

THE conditions of competition for a school building at Fulham, published in the *Wandsworth and Banstead Times*, are of some interest. There are to be twenty-eight to thirty classrooms, two drawing-class rooms, two classrooms for teaching women's work—sewing &c.—a gymnasium, the usual superintendent's offices, store-room for teaching materials, and so forth. A kitchen and dining room in the basement for poor children is also noted. Careful instructions are given as to materials, even the particular brickyard to be chosen being specified. This is one point in which competition differs from those to which English architects are accustomed. And is the publication of the names of the assessors, five in number; and still more striking are the duties required of the gentlemen. They are to form a judgment on each set of designs sent in, and their final decision thereon; and these judgments are to be published, a copy is to be sent to each competitor, and they are to be displayed at the exhibition of the designs. The architect who shall carry out the work shall be the prizewinner, or, should he be chosen with the prizewinner's full consent. This is a good example for English competition committees.

THE Guardians of St. George's Hanover-square, recently gave notice of their intention to acquire certain property for the alteration and enlargement of the infirmary attached to the Union in Fulham-road, Chelsea. The scheduled premises comprise Nos. 391-3, the main road (owned by the Carpenter Company and others), and Nos. 11-22, Vicarage-grove, belonging to Mr. R. Gunter, Mr. Gunter, and Mr. W. E. Maude. The premises possess some interest; for in 1787 the parish of St. George bought Shaftesbury House from William Virtue as an additional workhouse, and an Act in that behalf passed, the house and grounds to be in St. George's parish so long as it should serve that purpose. That house, notable for its interior and charming old-fashioned garden, was purchased by the third Earl of Shaftesbury, author of "Characteristics," in 1699, from the B family, heirs of the widow of Sir J. Smith, who it is supposed built it in 1610. Here Lord Shaftesbury built himself a library and cultivated vines and other fruit trees. In 1710 he sold the property to Nathaniel Luttrell, the famous tract and book collector. The property, together with Luttrell's collection, passed to Edward Wynne, author of "The

* See the cuts in the "Art Union," 1848, and the F. W. Fairholt, in Croker's "Walk from London to Fulham," edit. 1860.

legal works, who died there on ber 27, 1784. His brother, the Reverend Wynne, of All Souls, Oxford, succeeded to the house, and to the library by Luttrell, his brother, and his Sergeant Wynne. He alienated the to William Virtue, above-mentioned, the contents of the library were sold at y's, 1786. Some maintain that the had been the home of Boyle, the pher, where, in Little Chelsea, he was by Evelyn, Sir Robert Murray, and Shaftesbury House remained until when it was pulled down for new ouse buildings.

THERE has just been pulled Lion," down this old-established n. which gave a name to the at whose corner it stands, as well as adjacent Red Lion-fields (now square). in Howes' edition (1631) of, Stow, joined the "Blue Boar"—the "George ue Boar" stood directly opposite. The of the regicides were taken from nster Abbey to the "Red Lion," and it is commonly said, to Tyburn. Respublica" of Sir J. Prestwich avers Cromwell was buried in a small k near Holborn, in that very spot k the obelisk is placed in Red uare." The square was laid out in the garden was opened to the public ust 10, 1885, at the charges, 250l., etropolitan Public Gardens Associa- a lease by the trustees.

THROUGH a letter in the *Times*, signed by Lord Northbrook and others, the public are invited d in subscriptions not exceeding five s to the care of Messrs. Hoare, 37, street, towards a memorial window to Austen, to be inserted, with the al of the Dean, either in the nave or Chapel of Winchester Cathedral. Austen lived for some little time at ester (the house in which she stayed e remember right, distinguished by ation); she was buried in the cathedral ct, but there is no monument to her in edral beyond a brass tablet let into ll, placed there in 1870. Sympathisti- ntirely with the desire to see an ate monument to Jane Austen, one of t most remarkable writers England ever ed (Tennyson ranked her as in some s "next to Shakespeare"), we should to see an architectural and sculptured al rather than a window, because we see how any design suitable in type pirit for stained glass could also be le as a memorial to Jane Austen. annot in any way associate the idea of d glass or ecclesiastical decoration e type of genius; the two ideas are ruous. A sculptured monument e treated in a freer spirit, and would uch more suitable. We should like what Mr. Onslow Ford would make

SINGTON GRAMMAR SCHOOL.—Under a scheme Charity Commissioners, this school, in Ken- square, and founded in 1873, will be entitled Kingston School of Science and Art, and be d to obtain grants from the Science and Art ment, as well as from any local authority the Technical Instruction Acts. The tuition or the pupils (boys) will range from one to guineas per term.

THE FLORENTINE RENAISSANCE.*

BY PROFESSOR AITCHISON, R.A.

IN my last lecture I spoke of Brunellesco and Alberti, the two great founders of the Florentine Renaissance, and I think it will be well just to mention the names of a few of the celebrated architects who came between Alberti and Bramante. However, I shall mainly dwell on those semi-architectural works, that were sometimes done by the sculptors and sometimes by the architects, that give us so deep an insight into the elegancies and beauties of the Renaissance, and charmed the contemporaries of these men, as they charm us now by the beauty and refinement shown in their works; though in fact most of the sculptors were architects as well. I will, however, just mention one or two of the well-known architects before touching on the sepulchral monuments.

Michelozzo (1391-1472) was looked upon as the most regular architect after the death of Brunellesco, and was a great favourite with Cosimo dei Medici, for whom he built the Medici Palace, now called the Palazzo Riccardi.

Benedetto da Majano (1442-1497) and Cronaca (1455-1509) built the rival Palace of the Strozzi.

Giuliano and Antonio da San Gallo (Giuliano, 1445-1516; Antonio, 1455-1534), the wood carvers, although very able architects, do not seem to me to have given a sufficient stamp to architecture to make their works of sufficient importance to be noticed in a short abstract, until the days when Giuliano was appointed one of the head architects of St. Peter's.

Antonio Filarete, statuary and architect, built the hospital at Milan, and is supposed to have furnished in his MSS. book much information to Vasari.

The first monument I give you is the Gothic one of Can Signorio della Scala, by Bonino da Campiglione, 1375, in the cemetery adjoining the Church of Santa Maria Antica at Verona. I have given you this Gothic one, because it shows the great difference in grace and style between it and the next one, which was only thirty-eight years later. I give you these Renaissance monuments of the fifteenth century to impress more strongly on your minds the grace and elegance that had been introduced by the study of the antique.

The next one that I give you is Renaissance, and is the effigy of *Isabella del Carretto*, by Jacopo della Quercia (1374-1438), 1413, in the Duomo, Lucca. This monument consists of a large oblong marble chest, standing on a highish base; the vertical sides of which, between the base and the capping, are ornamented with winged Cupids supporting huge festoons of fruit and flowers, and you will observe the great variety of action in the Cupids to prevent monotony. On the top of this chest *Isabella del Carretto* lies at full length, with a turban-shaped cap and a very high collar to the dress. The head rests on two pillows. She was apparently a young woman of delicate features, but a part of the face, particularly the nose, has got slightly damaged; the hair shows a little below the cap, and is bound round with narrow ribbons. It is rather an example of sculpture than of architecture, but you will observe a grace and suavity about it which removes it far away from the monument to Can Signorio only executed thirty-eight years before.

The monument to *Leonardo Bruni*, who was one of the humanists of the fifteenth century, was executed by Bernardo Rossellino (1472-1478), in 1444, and is in Santa Croce, Florence. It has much greater architectural pretensions than the one to *Isabella*. On a high plinth, whose central portion is carved with Cupids supporting festoons, and with a lion's head in the centre, stand the pilasters supporting the arch which forms a canopy over the sarcophagus and the effigy. On either side are two Corinthian pilasters with a Renaissance variety of cap. These support a piece of entablature that returns on the back of the tomb. The architrave of two fascias has carved mouldings, and the frieze is ornamented with floral ornament nearly covering its whole surface; the cornice above has also carved mouldings, and on its top supports a deep semi-circular arch, the fascias of whose archivolt form

* Being the fourth Royal Academy lecture on Architecture this Session. Delivered on Thursday afternoon, February 10.

a sort of architrave, frieze, and cornice; the cornice and the architrave have carved mouldings, and what may be called its frieze is nearly covered with one of those cables of leaves formed round a centre stem and bound together outside. Over the centre of this archivolt are two Cupids holding a medallion with a cabled rim of leaves, which has in its centre a shield carved with a rampant lion. Between the pilasters and just above their base is the base of the sarcophagus supported on stands whose ends are carved into lions' heads and claws; the sarcophagus itself has a shallow cornice, with the main body panelled. In the middle is a large engraved slab occupying nearly the whole height and about half the length. This inscribed slab is supported by two flying genii; on the top of this sarcophagus are the supporters of the bier. The fronts of these supporters of the bier are carved with Roman eagles—the embroidered pall hanging partly over the supports and partly between them. On this is the recumbent figure of Leonardo, with his head supported by a pillow; the wall at the back of the bier is divided into three panels, and each panel is formed of a slab of purple porphyry. Above the main top rail is the architrave of the entablature; above the cornice and below the arch is a frame enclosing the lunette, the centre of this is filled with a medallion on which is carved Madonna and Child. The medallion itself is supported by two kneeling figures. The whole monument is of rather narrow proportion and is highly ornate; from the care which has been taken to keep the carving flat, this ornateness is not overpowering.

The monument to *Carlo Marsuppini*, also in Santa Croce, was designed and executed by Desiderio da Settignano in 1453. Desiderio was the favourite pupil of Donatello, and was looked on by his contemporaries as a heaven-born genius; born 1428 and died 1463. This monument greatly resembles the one to Leonardo Bruni. It consists of a semi-circular arch supported on the projecting ends of an entablature over two Corinthian pilasters. These pilasters stand on a high pedestal with a base and cornice and a very deep plinth; the base of the pedestal has winged figures at each angle, and a vase in the middle, from which depend two festoons with floating ribbons. On the angles of these pedestals and at the feet of the pilasters stand two naked Cupids supporting shields. The entablature has its architrave covered with enrichment, and also the frieze above; the carving of the frieze is rather deeper than that of the architrave; the cornice has its mouldings carved with dentils; the archivolt of the semi-circular arch mainly consists of a plain face with a border and slight capping above, and is filled with bunches of fruit and flowers. In the lunette beneath the arch is a medallion with Madonna and Child supported by two figures in the spandrels. Below the entablature are four panels with moulded rails and stiles, the panels being of purple porphyry. The sarcophagus stands on a high plinth, and is supported by lions' paws at the ends, and by a shell in the middle of two wings in the middle. From the lions' legs foliage springs, with pierced spirals on the angles and other spirals against the end of the tablet that bears the inscription. The roof of the sarcophagus is covered with scales and on this rest the supporters of the bier. The bier is covered with a richly embroidered pall, and Marsuppini is lying on his side, so that his face is seen from the choir. On the centre of the arch is a vase with an elongated neck, and from this festoons depend, touch the back of the arch and are supported on the shoulders of youths standing on the top of the entablature; the wide ends of these festoons hang down nearly to the level of the effigy.

The proportions of this monument are rather more graceful than those of the former, and the back being divided into four panels instead of three gives a much better effect. Each of the children with the shields has all the charm of a shy child. The pierced scrolls of the sarcophagus are some of the most marvellous work that is to be found. There is one with similar pierced scrolls at San Francisco at Assisi. A full-sized cast of this, as well as of that to *Isabella*, are at the South Kensington Museum.

There is a lovely tomb to *Barbara Ordellaffi* in San Giralomo, Forlì, erected in 1466; the artist is unknown. This monument is rather more complete in its architecture than the former, for it is crowned by a cornice, the

spandrels above the arch being filled in and adorned with Tuscan shields in the shape of horses' skulls. I may note that the architectural rigidity is taken off by the looped, damasked drapery above the effigy.

There are two monuments in la Badia at Florence, by Mino da Fiesole (1431-1484), Desiderio's favourite pupil and imitator; the one to Bernardo Guigni has not quite the exquisite grace of those mentioned before, nor of Mino's other monument to the Marquis of Tuscany, the porphyry slabs and inlays being a little overdone, the proportions not being quite happy and the ornament rather stiff.

In the one to Ugo, Marquis of Tuscany, of 1472, there are also two charming little naked children with shields, standing on a base, and instead of a central porphyry slab as in the one to Guigni, this has a white marble panel with Madonna in front, with a distaff in her right hand and the Bambino on her left arm, while another child is trying to climb on to her knee. In the frieze are three shells, one at each end, and one in the middle, from each hang two light festoons of leaves and fruit, over the carved architrave; the curved lines of the festoons and their irregular outlines take off the rigidity from the monument, while these curves are echoed by the folds of a looped curtain below, and the stiff flutings of the pilasters are contrasted with the conical folds of the curtains and the slanting lines of their bordered ends. The whole monument is a masterpiece of proportion, of composition, of exquisite ornamentation, of monumental colour, and of perfect execution. The last time I saw it was in company with Cavaliere Costa, the Roman artist, who was still enchanted with his last view.

In the Cathedral of Lucca there is a beautiful tomb to Pietro da Noceto, secretary to Nicolas V., by Matteo Civitate, (1435-1501), in 1470; but I think those monuments to Marsuppini, to Barbara Ordelaffi, and Mino da Fiesole's tomb to the Count of Tuscany, bear the palm.

I have dwelt on these semi-architectural monuments partly on account of their exquisite perfection, and partly to make clear the new sense of grace that had begun to pervade the arts and to charm society; for there is nothing to equal them in that style, as far as I know, except the exquisite doorway of Santa Maria dei Miracoli, at Brescia, whose architect is said to have been Ludovico Bercetta, in 1487-90.

After the monuments I must say a few words about Bramante's influence over the revival, which was so very strongly marked that I think he may be looked on as the third great typical architect of the style. One of his inventions was a rhythmical arrangement of the pilasters on the fronts of buildings, instead of using them singly at nearly equal intervals. Without exactly coupling them, he made one space narrow and the other one wide, as may be seen at the Cancellaria at Rome.

I by no means wish to restrict his gifts to this one peculiarity, but it certainly was a peculiarity which is more easily recognised than anything else he did, although his great gift to the Renaissance was a new and more delicate sense of proportion that marks all his work.

Another of Bramante's inventions is best exemplified by the doorway of the Cathedral at Como. The door-opening itself, which is a trifle squat, is raised in height by its entablature, supported on two pilasters. On either side of these pilasters are two stories of niches containing statues, and then another pilaster; the head of the doorway is circular and blank, the lunette over the doorway has the Flight into Egypt carved on it, and the outer zone is divided into panels by radii, each panel containing a sculptured figure. This is finished by a narrow archivolte, flat in section and highly ornamented, and from the extreme edges of this, the doorway is carried up square, with a triangular pediment. Another charming solution of a difficulty is in the cloisters of Santa Maria della Pace at Rome. The lower story consists of an arcade with Ionic pilasters on pedestals in the middle of each pier. These pilasters support the entablature, and above them is a solid parapet. Over the pilasters below are Corinthian pilasters, also supporting an entablature, the frieze of which is filled by the cantilevers that support the cornice, and between the main pilasters are slender columns with capitals; the whole composition being original, simple, and effective. Beside the Choir and Dome of Santa Maria delle Grazie at Milan, we owe to him the original design for St. Peter's. Bramante had made a particular

study of graceful proportions, and to perfect this he had studied with great accuracy the proportions of the human form as well as that of the horse. He was not only one of the most versatile of the Renaissance artists, but had that great gift of having all his knowledge and faculties at his fingers' ends, for it is said of him that whatever any one wanted, Bramante could always give a sketch for it at the moment. He initiated into the art Raphael, Baldassarre Peruzzi, Antonio da San Gallo the younger, and many others, and both from the remarks of his contemporaries and our own observation we may look on him as the greatest architect of the Renaissance; for it is difficult to say how much Raphael, Peruzzi, and Antonio da San Gallo owed to him in their subsequent designs. Hard things have been said about him in connexion with Michelangelo, but it is not unlikely that the great architect of the Renaissance was not an admirer of Michelangelo's architecture, and his introduction of the great Raphael to the Pope, was not altogether pleasing to the surly genius of Michelangelo. Bramante lived to the age of seventy, but during his latter years he was much troubled with gout and palsy in his hands.

I trust the students who are ambitious will not neglect the study of Bramante's works, and particularly of the grace and dignity which he imparted to all his works, for I am sorry to see that there is a great want of style, proportion and monumental dignity about the work of our most advanced students.

It is comparatively easy to captivate the vulgar eye by boldness, and even by coarseness; but to those who really know, nothing can confer so much dignity as lovely simplicity and exquisite proportion.

I know only too well the many distractions that beset the architect, the learning to plan, to construct, to shape the parts, and to design, to perfect himself in any one of which may occupy a clever man's whole life, but the ambitious student of genius should consider what his great predecessors in our art have done. All the great Renaissance architects were either painters or sculptors as well, and were proud of their versatility, and at least understood enough about construction to make their buildings stand. F. Francia put goldsmith on his pictures, and probably painter on his plate. I am sure that enough study of the works of the past is not given by the architectural students of the present day. Think of the laborious studies of the painters, the years it takes them to learn to draw the human figure, the studies they make of the great pictures of the past, and consider, too, the studies of the poets, that Tennyson learnt Hebrew to see if he could discover the means their poets employed to raise emotions. Architecture is not a money-making art, but one that may confer immortality on the architect, and bring admirers from the whole world to his country.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of this Institute was held on Monday evening at No. 9, Conduit-street, Mr. H. L. Florence, Vice-President, presiding.

The minutes of the last meeting having been taken as read, a paper entitled "The Mediæval Campanili of Rome" was read by Mr. J. Tavenor Perry. The lecturer, in remarking on the well-known character of these towers, and the fact that so little was known of their history or had been written about them, showed the urgent necessity of some detailed record of them, since already many had disappeared, and all were falling into a state of serious dilapidation. After giving a list of the campanili still standing, he pointed out that tower-building was a tradition of Roman classical times, and mentioned those built by Pliny, Augustus, and Diocletian, and representations of those which have been found, particularly that on a ceiling discovered in the Farnesina gardens by Professor Lanciani. The first recorded erection of a bell-tower in Rome is that of St. Peter's, in the middle of the eighth century, which was restored by Leo III. a few years later. In giving an abstract of the principal events in Mediæval Roman history, as related by Gregorovius, an attempt was made to show that only during very limited periods were building operations possible in Rome, and that the most important of these was the time of Leo the Fourth, after the repulse of the Saracens. The details of the construction and

decoration of the towers were described in relation to their likeness to or divergence from classic examples, particularly in reference to their arcades; and an attempt was made to compare between these and the windows of some English towers known as "Saxons," whence did the Saxons derive ideas on this subject? Not from the vestiges of antiquity still remaining in this island, not from France or Germany, such features were unknown; but only place where they could by any possibility exist—Rome itself. Alfred the Great, or St. Peter's for the coronation of his son, Ethelwulf, had before him the great campanile of Stephen and Leo, and, when leaving, the steps of the atrium he may have seen the panicle of S. Michele of the Saxons in the much as we see it now." A comparison further made between the dated examples of towers both in north and south Italy, those of Milan, Amalfi, &c., with a view to show that the Roman examples were of earlier date. The niches on some of the towers were described, and it was suggested that they were not intended for statues, but to hold sacred paintings, of which great numbers had reached Rome from Byzantium in the time of Leo the Iconoclast. The majolica decorations were mentioned as indications of date, and SS. Giovanni e Paolo being assumed to be equal with the tower, and painted for the occasion they occupy. In conclusion, an attempt was given of the state of dilapidation which most of the campanili had fallen into, the damage which had been done to the injudicious restoration or repair. The lecturer was illustrated by pen-and-ink drawings, author, of the towers and their details, which are reproduced in the Institute Journal.

Mr. Phénix Spiers, in proposing a vote of thanks to the lecturer, said that Mr. Perry endeavoured to prove his argument by a course of reasoning. The first was historical one, with regard to which he had the great advantage of coming to the book by Herr Gregorovius, translated by Hamilton, which, from the extracts taken, seemed to be very carefully and most interesting. It was almost the first we had had a careful inquiry into this. Mr. Perry had already pointed out that it had been neglected by every one, a few extracts given by the lecturer, that there were ample records to the contrary of what had been generally accepted, namely, that these towers were of the eleventh and twelfth centuries, a historical record, so far as it was taken, that author, was he (the speaker) fairly satisfactory. Then the second course of reasoning was what might be called the of the subject. They knew perfectly well that towers did exist, and that there were existing at S. Apollinare in Classe, Ravenna, which was of the sixth century, of which there was not any possible doubt was a lofty tower, the lower portion without any openings, or openings of small size, and the upper portion with windows similar to those shown that Mr. Perry had not been able to find out in what way the window was divided, by a capital with columns or not; but events, there was in the sixth century a lofty and important bell tower existing in Ravenna, and it seemed curious that should have to wait till the eleventh century before they found a bell tower in Italy. There might have been bell towers which been destroyed since, and Mr. Perry pointed out the troubles that there were in the seventh and the greater part of the eighth century, which might have made it difficult to build any there; and it really until about the time of Charlemagne that affairs settled themselves down, and were able to go on building. It was a period to which Mr. Perry ascribed the campanili which he had described last night. There was another question which Mr. Perry had suggested in his paper, namely, destruction that took place by the Saracens, Normans and others; and the question whether, as they burnt all the churches allowed such lofty towers to exist still. To a point which might have brought their authors, Cattaneo Fergusson, and the idea that they must have been all destroyed, and that these were later restorations. Mr. Perry, in his third course of reasoning, spoke of certain features. As regards

it was a question for an expert, and, having seen the plates, one could not judge what period they were likely to belong to. It was one satisfaction to Mr. Perry to find one of the designs he had exhibited certainly of Byzantine origin, and there was extremely possible that it might have been brought from the East. Then, as to the shaft and the division, there he found it difficult to follow Mr. Perry, because he called a feature which he (the speaker) upon as a "dosseret" or "block" the capital a "capital" frankly. That the capital what one understood by a "Byzantine dosseret" he meant an arch-block invented by the architect to carry a column of greater width than the columns of the Byzantine architects always reckoned that column, being of one material, was capable of supporting a much greater weight than a column of equal area, and in order to place a column upon the small column of this capital he was obliged to introduce an intermediate capital. That intermediate feature might have been a corruption of the architrave block, but always seemed to him to be a feature which a reasonable person would design for that, and that was to say, for carrying a wall much wider than the column below. It did not matter whether they called it a "dosseret" or a "block" but it was one of the important elements of Mr. Perry's argument to prove that that feature was introduced without the capital underneath; and he agreed with him that this was an instance of a singular instance, of an absence of well-known features in those early times. They knew it had been copied from a country in Saxon periods, and the use of a cap was an argument considered by Mr. Perry's favour. He did not quite understand Mr. Perry's reference to the arches of the Palace of Diocletian at Spalato, which he used to take as the first example of that, and that was that as soon as the architects got to Rome they were fond of indulging in which had been taking place lately in this country, namely, in the designing of Free styles. They were no longer bound by the rules of Vitruvius; and the anomalies, and changes which they introduced into the architecture of the East and Dalmatian, such as would not be tolerated in Rome, brackets carrying shafts, which carried away, were one of these vagaries which the Classic gave them. At St. Demetrius, Thessalonica, the capital was designed in that, in fact, it was moulded at the two ends at the sides. It was a Byzantine idea which might have been taken from St. Apollinare Nuovo. There was another feature which he supposed to find in Spalato as the first example, but which he endeavoured some short time ago to prove was found at a much earlier date in the East in an arch in Damascus. The arch at Damascus was certainly of the time of the Antonines, and had two niches on each side of the doorway, which were supported by two shafts bearing capitals with volutes over them, and the whole of the architrave was moulded round the niches. The first instance that we knew of, of the daring of taking the entablature right round the arch. Mr. Perry's theory accounted for these features that they found in Saxon work. Mr. Perry had alluded to three or four of the churches. There was one that he (the speaker) visited only the other day—the church of St. Martin. During the restorations a few years ago they came upon the original Saxon work, and these windows were identically like the windows in St. Maria in the East. They were probably representative of other features of the kind. There were others at Sompting, and elsewhere; and the copy was a rude and commonplace imitation which had an origin, and it seemed to the speaker only origin it could have had was in Rome. That explained the work in the churches to him so clearly that, if it were not for reason alone, he should be inclined to Mr. Perry's reasons and argument.

H. H. Statham seconded the vote of Mr. Perry for the very useful paper he had read, and which had given some new information. Chairman, in putting the vote of thanks meeting, said they sent out every year a travelling student the gainer of the Soane Medal, and it might very possibly be that they had read and learnt and seen and photographed all that there was seen now in those foreign travels; but

they had learnt from Mr. Perry's paper that there was really yet a great deal more to be learned from the architectural study of buildings. They had only taken what some persons writing upon the history of architecture, or some guide-book, had stated to be the fact, and without due examination. Mr. Perry had shown that even upon subjects like the Campanili of Rome, a subject upon which they all thought they were well acquainted, there was yet a great deal to learn.

The vote of thanks having been carried unanimously.

Mr. Tavorner Perry, in reply, said in reference to the dosseret Mr. Spiers did not exactly explain the difference that there was between it and the Roman corbel capital; the drawing of the Schwartz Reindorf showed what Mr. Spiers called an elongated dosseret. The Roman example differed absolutely from those German examples as from the Byzantine, in that there was no capital whatever intervening between this (call it the dosseret for the sake of argument) and a shaft underneath it. And that was the extraordinary likeness between the Campanili in Rome, Albano and Tivoli, and those of Saxon work like Sompting. There was something in Subiaco in the cloisters, which was very like it, with a shaft very elaborately carved coming immediately underneath it; but it was worked two centuries later. He thought that the question of the dosseret was a very important argument in his favour.

The Chairman said that a special general meeting would be held on the 7th prox., to elect the Royal Gold medalist, to be followed by a business meeting for the election of members.

The meeting then terminated.

ARCHITECTURAL SOCIETIES.

THE EDINBURGH ARCHITECTURAL SOCIETY.—At a meeting of this Society, held in Dowell's Hall on the 16th inst.—Mr. Wm. M. Cumming, President, in the chair—a paper was read by Mr. J. E. Forbes, entitled "Normandy." Mr. Forbes gave an account of his tour, and sketched the general characteristics of the towns in Normandy, especially pointing out the peculiar beauty of colour pervading the landscape. Rouen was specially mentioned as being exceptionally artistic, showing fine examples of fourteenth and fifteenth century architecture. Passing on to Lisieux, Mr. Forbes mentioned the timber-framed houses as worthy of notice, comparing favourably with similar work in Chester. The paper was illustrated by limelight views.

CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—The annual dinner of the Cardiff, South Wales, and Monmouthshire Architects' Society was held on the 10th inst. at the Angel Hotel, Cardiff, the guests including Professor Aitchison, R.A., Mr. Lanchester (one of the successful competitors for the proposed municipal buildings in Cathays Park), the Mayor of Cardiff (Alderman Ramsdale, J.P.), and others. The chair was occupied by the President of the Society (Mr. C. B. Fowler), who had designed a frontispiece for the toast list and menu card. Following the loyal toasts, Mr. E. W. M. Corbett gave the toast of "Our Pastors, Legislators, and Defenders." Captain W. H. D. Caple acknowledged the toast chiefly on behalf of the Volunteer branch of the service.—Canon Thompson, D.D., submitted the toast of the evening, viz., "The Local Society and the Royal Institute," and expressed the hope that after this lapse of three years the annual dinner would be continued in its proper course. They would have pleasure in seeing the local society thrive, and in seeing the Royal Institute also succeed. After referring to architecture as being, next to literature, the most eternal of the arts, the rev. gentleman advised a close study, and the acceptance of the Renaissance style as compared to the Gothic, because of its perfect symmetry and exquisite proportion.—The Chairman, in the course of his reply, dwelt upon the condition of the South Wales Society, which was formed in 1890. Although the membership had decreased from twenty-eight to eighteen last year, he was pleased to state that from the number of applications and the various letters of inquiry they hoped that in a short time it would be greatly increased.—Professor Aitchison, R.A., also responded, and at the outset expressed the gratification of himself personally and of the Institute at the invitation accorded him to visit South Wales

for the first time. It was the duty of local societies (the Professor declared) to follow the particular forms in architecture that were most suitable to the districts in which they resided, because the buildings must be associated in some form or other with the scenery and surroundings. The Royal Institute had done a great deal, and hoped to do more, in the direction of gaining an intimate knowledge of the architecture in different parts of the world, and its Examination for Associates was most valuable, and he was pleased when in Brussels recently to hear the encomiums passed upon the standard and character of the work of these Associates. The ideal of architects was to make their buildings as Nature made her works, and while making them beautiful yet endow them with a strong character. The charms that could be added to architecture were such that no effort was too great, in his opinion, for those who possessed the genius to bestow it upon their country. The greatest makers of architecture provided examples at a time when the people were trying to give the greatest attention to form and character, and most of these were in temples built to their gods. If the lessons thus taught were added to the lessons taught by Nature they must make an immense advance. Before long he believed that the younger generation of architects would suddenly burst forth into an enthusiasm that England had never before seen, and with the Divine gift of genius would spare no time to bring it forth, so that England might be like Greece, Rome, Italy, and France—a place where the people came to admire that which is high, noble, and beautiful. In conclusion, he again hoped that England would be one of the countries that people from all parts of the world would visit to see how its high expressions of beauty and utility are cultivated.—Mr. Lascelles Carr submitted the toast of "The Governing Bodies," in the course of which he said that he believed there was a higher and more important trait that should be observed by architects than to "design in beauty and build in truth," and that was to build with purpose. Referring to the Cathays Park site the speaker said it afforded for architects natural advantages which no other town could possibly provide, and it behoved the Corporation of Cardiff to leave no stone unturned, and to grudge neither money nor time, in preventing the erection of any architectural monstrosity upon it to provide an everlasting scandal.—The Mayor (Alderman Ramsdale), the Deputy-Mayor (Alderman D. Jones), and Mr. Lewis Williams replied to this toast.—Mr. Edwin Seward submitted the toast of "The Master Builders," which was replied to by Mr. J. E. Turner (President of the Master Builders' Association).

LIVERPOOL ARCHITECTURAL SOCIETY.—At the meeting of the Architectural Society of Liverpool, in the Law Library in Union-court, on the 21st inst., Mr. F. E. P. Edwards read a paper dealing with the origin and the external and internal development of St. George's Hall. On the proposition of Mr. George Bradbury, seconded by Professor Simpson, of University College, a vote of thanks was conveyed to Mr. Edwards for his paper. Mr. W. E. Willink, President of the Society, occupied the chair.

COMPETITIONS.

WOLVERHAMPTON NEW FREE LIBRARY.—Mr. Waterhouse, the assessor appointed in the competition for the Wolverhampton New Free Library which is to be erected as a memorial of the Jubilee, has placed first the design sent in by Mr. H. T. Hare, A.R.I.B.A., Adelphi, London; the second premiated design being that of Mr. J. M. Brydon, F.R.I.B.A., Newmarket, London. The first premium is 100 gs., the second 50 gs.

NEW CHURCH AT SPARKBROOK.—The trustees of the Birmingham Churches Fund have appointed Sir Arthur Blomfield to act as their assessor in the competition for a new church in the parish of Sparkbrook, in place of Christ Church, Birmingham. The following is the list of architects to whom invitations have been addressed: Messrs. Bateman & Bateman; W. H. Bidlake, J. A. Chatwin, R. Creed, J. Douglas, W. Henman, H. E. Lavender, M. Macartney, E. Mansell, Temple Moore, F. B. Osborn, and T. F. Proud.

WORKHOUSE INFIRMARY, DORKING.—In response to the invitation of the Guardians, a large number of designs for this building were submitted. The Guardians selected ten

of these, and appointed Mr. Edmeston, assessor, to make the final decision. He has awarded the premiums as follows: 1. Mr. H. Percy Adams, Woburn Place, W.; 2. Mr. J. H. Cossar, Stamford, Lincolnshire; 3. Mr. Clarence Coggin, Adelphi, W.C.

MUNICIPAL BUILDINGS, BARNSELY.—At a recent meeting of the Barnsley Town Council, the Watch and Streets, Buildings and Improvement Committees recommended for approval the following recommendations of a sub-committee of the two-named committees:—That municipal buildings be erected on the site in Eldon-street and Kendray-street, at present occupied by Messrs. Robinson & Sons' works; that architects be invited to submit competitive plans of municipal buildings; that the Borough Surveyor be instructed to prepare instructions and plans of the site for competing architects; and that the architects submitting the plans adjudged to be first, second, and third in order of merit be awarded premiums of 100l., 50l., and 25l. respectively, the premium of 100l. (in case the architect obtaining it be instructed to carry out the work) to form part of the remuneration of such architect for carrying out the work.

HARROGATE TECHNICAL INSTITUTE.—At a meeting of the committee of the Harrogate School of Art, the report of Messrs. Woodhouse & Willoughby, architects, of Manchester, on the competitive designs for the new school, was considered. The committee awarded premiums of 20l., 10l., and 5l. respectively, in accordance with the report issued by the assessors, as follows:—1. Mr. W. J. Morley, F.R.I.B.A., architect, Bradford and Harrogate; 2. Messrs. Bland & Brown, architects, Harrogate; 3. Mr. J. E. Marshall, architect, Harrogate. A site has been secured for the school at the corner of East Parade and Haywascrescent.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The sixth meeting of the session of this Association was held at 32, Sackville-street, Piccadilly, on the 16th inst., Mr. Blashill, Hon. Treasurer, in the chair. Mr. J. Chalkley Gould exhibited a pack of playing cards printed at Besançon in the latter part of the last century. The Chairman exhibited a small bag worked with silver thread, which contained a deed, being the conveyance of land, with the impression of the seal affixed, the date being the 31st of Ed. I., and he also exhibited a receipt on paper for money paid to Mr. Abraham Gould, dated 1610, who acknowledged it as a receipt in full from the beginning of the world. The paper of the evening was by the Rev. W. S. Sack-Szyrona, M.A., on "Australian Lights on Britain in the Later Stone Period." The scope of the paper was entirely anthropological, and a report of it does not therefore come within our programme. The Hon. Secretary, Mr. Patrick, read some notes descriptive of a sketch sent by Mr. J. T. Irvine, received from the Rector of Bassingham Church, Lincs, of a curious early font discovered below the floor when the church was restored. It is oblong in shape, 2 ft. long and 1 ft. 5 in. wide, and 10 in. thick. The font has on one face interlacing knotwork and cable moulding of uncommon design, and has apparently been formed out of the socket stone of a still older churchyard cross.

CENTRAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

The twenty-sixth annual general meeting of the Central Association of Master Builders was held at the offices, 31 and 32, Bedford-street, Strand, W.C., on the 10th inst., the President, Mr. Wm. Shepherd, in the chair.

The notice convening the meeting having been taken as read, the minutes of the previous meeting were read and confirmed.

It was proposed by the Chairman, seconded by Mr. Geo. Hailes, and resolved, "That the following report be received and adopted":—

1. The Council, in submitting their twenty-sixth annual report, are able to state, from information received from members of the Association and the various official returns, that business continues good and that future prospects in this respect are satisfactory.

2. Since the last report was issued an agreement has been concluded with the labourers, which was then in abeyance, the particulars of which were at the time furnished to members.

3. Requests for working rules and to fix a standard rate of wages by the Painters and Decorators'

Societies have not been concluded, as upon investigation it was apparent that work in this trade was so varied and complicated in character, and also the degree of skill and efficiency required in the workman so unequal, that if anything was done, to do it fairly it needed a careful classification both as regards the work and the workman, and precluded the possibility of adopting a uniform rate of wage; even if this could have been accomplished, it would not have satisfied the applicants, whose object was to establish an uniform minimum rate of wage. The Council offered to discuss working rules, leaving out the question of wage altogether, but the representatives of the societies declined this, and the negotiation thereupon ended.

4. A similar application was received from the Engine and Crane Drivers Union, but having regard to the smallness of their numbers and limited employment it was considered advisable to obtain information from the firms employing them as to what was the custom or practice; this was found to be so varied both in regard to wages and conditions of employment that it was decided it was inexpedient to accede to the application, and the applicants were so informed. It is hardly necessary to add that these workmen must of necessity conform to the working rules of the other trades when engaged upon building or engineering works, and a separate agreement in this respect is unnecessary, and the varied character of their employment renders an uniform standard rate of wage impracticable.

5. Notwithstanding the agreements concluded with the several trades unions, and the inclusion in all of these of a conciliation clause with a view of reducing friction and putting an end to frivolous disputes, the Council regret to say that they find members are still subjected to vexatious and tiresome experience in the conduct of their businesses, and the Council have consequently complained of the conduct of the workmen, and breaches of not only the spirit but the letter of the rules.

6. Petty strikes of plasterers have occurred in a number of firms, and the remonstrances of the Council and Committee have been either met by evasions or the *non possumus*, and though no serious inconvenience has resulted, undoubtedly loss and annoyance have been inflicted.

7. The same observations apply to the bricklayers. An effort was made to remove a constantly-recurring trouble by getting them to admit the utility of their objections to tilers doing roof tiling. The plumbers appear anxious to emulate the plasterers and bricklayers in giving trouble, and are equally unreasonable when being dealt with.

8. The conduct of all the trades appears to be determined by consideration more or less Socialistic and Communistic and without any regard to the reasonable and proper relationships which should exist between employees and their employers, and the entire absence of any recognition of the obligations on the part of the former to give a fair day's work for the wages received, but, on the other hand, to rather regard what they get from the employer as lawful plunder. It would be unfair to apply these observations to the individual workman, but it does not unfairly illustrate the result of the operation of the labour organisations in the social relationship with capital and labour. It is unfortunate that politicians of all shades of opinion at the present time appear to vie with each other in patronising the handicraftsmen and working to obtain their goodwill and favour, and so exaggerating their importance in the social scheme, apparently ready at any time to secure their support by the sacrifice, if necessary, of other interests. They have not a preponderating voting power and by such means accentuating all labour difficulties.

9. The scarcity of efficient and competent workmen in all trades throughout the country is evident, and much trouble and difficulty can be set down to this cause. There is a remedy for this in the hands of employers themselves, and that is to undertake the training of a sufficient number of apprentices in all trades, holding out inducements for parents to bring their boys up to trades by paying better wages during apprenticeship, also by encouraging young men who have obtained a partial knowledge of a trade to complete their training, and by using their influence with managers of industrial schools and charitable institutions to bring up lads to trade. This of course means a certain amount of responsibility and trouble to the employer, but when the result is considered and realised it will be found amply remunerative and satisfactory.

10. The Council have been consulted from time to time by the London County Council, who are large employers of direct labour, and the Board for London, who are so to a limited extent, as to the terms and conditions prevailing with the Association and the men in their employment, and have by affording these bodies the necessary information been able to bring them into line.

11. The Council desire to express their disappointment at the result of the House of Lords in the action of Allen v. Flood, the details of which they think it unnecessary to set out here, as they are sure members must have been interested sufficiently in the case to be familiar with them already.

12. The Council refer to the late strike and lock-out in the engineering trade with satisfaction, as it should be an object-lesson to employers in all other

industries, and they think especially so in the building trade, as in many respects there affinity between the two industries. The Building Federation of Employers are to be commended and congratulated upon the uncommon and practically unanimous stand they have taken against the men's unreasonable demands and vexatious conduct, and also on the success which resulted. They think, in the face of the question, "Of what use is the Association, not to be repeated, but the necessity is admitted, not only of this Association, but the National Association, and, what is more desirable of a federation of all the employing building trades throughout Great Britain, workmen are working for federation in all trades, and in self-defence, employers will have to take the same, not only for the purpose of meeting the combination of the workmen by a counter combination, but for establishing a powerful organisation, influence can be exercised whenever interests are cared for, protected, and defended, and is of such importance not to be ignored by any. Already the labour leaders are saying they will not be legislated against, and that they will be striking, and this is no idle threat.

It is necessary for employers to watch and legislate of this character. The Council have deavoured to make itself heard last session in the Workmen's Compensation Act was before Parliament, and some modification resulted from their efforts, but not anything like what they had hoped for, and in justice and fairness demand. This was not to be wondered at when a promoter in the House of Commons itself had stated that the promoters were not acting by considerations of justice, but were contented with those of expediency alone. There is not only no opposition to be opposed, but promoted. For instance, in relation to picking up refuse and what is now included in the term piece defined and called by their proper terms—boyce coercion, intimidation, assailing, maiming, injuring—and properly controlled and prevented.

13. The Council were invited to take part in a conference called by the Liberty and Protection League, with a view of establishing a Labour Protection Association, and they replied to the President to represent the Association, and his report of the proceedings at the conference desired him to act on the Executive Committee, gave a grant towards the preliminary expenses, is believed that this Free Labour Protection Association will do useful work, and that it is a grand means of success. The Engineers' Federation of Employers, as they are able to supply a large amount of free labour, firms who would probably, in the absence of the men, have had to make terms with the men or from the Federation, owing to the urgency of work and other circumstances.

14. The Council take this opportunity of expressing their obligations to the members of the various committees.

15. The Council would again urge upon the members the importance of inducing those employers who are not at present members to join this Association.

16. In accordance with the rules, the accounts will be presented to the meeting, and it will be necessary to elect two auditors and members of the Council. The elected members of the Council who retire are Messrs. F. S. Bywater, A. Killby, and B. E. Nightingale, all of whom are eligible for re-election.

The accounts for the year 1897 having been read, it was resolved, "That they be received and adopted, and a vote of thanks be tendered to the auditors for their services."

It was also resolved, "That Mr. H. S. I. and Mr. F. L. Dove be appointed auditors for the ensuing year."

It was agreed, "That Mr. F. S. Bywater, Mr. A. Killby, Mr. B. E. Nightingale, be elected members of the Council."

Other matters having been discussed, it was resolved, "That a vote of thanks be tendered to the chairman for presiding, and for his valuable services during the past year."

The meeting then concluded.

THE REDEcoration OF THE LIVERPOOL TOWN HALL.—The Finance Committee of the Council held a special meeting on the 15th inst. to consider further the matter of redecoration of the Town Hall. It was decided to invite Prof. Simpson, Principal of the School of Architecture and Applied Art, to submit a scheme upon which might be invited to tender.

Y.M.C.A. BUILDINGS, ABERDEEN.—A meeting of the Special Building Committee of the Y.M.C.A. Association was held on the 15th inst., to consider the new plans which have been prepared for the reconstruction of the Association buildings. It is proposed to reconstruct the front of the house, and alter the construction of the large hall in the rear, at a total cost of 2,000l. Messrs. W. Henderson & Son, architects, have been appointed architects for the reconstruction of the buildings.

THE SURVEYORS' INSTITUTION : LIABILITY FOR PROFESSIONAL OPINION.

Ordinary fortnightly meeting of this institution was held on Monday in the temporary premises of the Institution, Savoy-street, Strand, Embankment, the President, Mr. Joseph Oakley, occupying the chair. The minutes of the last meeting having been read and confirmed, Mr. T. W. Wheeler, Q.C., read a paper on the "Legal Liability for Professional Opinion."

The author dealt first with professional or expert opinion as the law regards it, and secondly, the degree of skill which the law regards as necessary to the practice of any particular profession or calling. He then dealt with the damages which may be given as a result of professional negligence. He then said that the date could be fixed for professional "opinion" was first recorded as evidence in our courts. The first evidence was to inform the tribunal of matters of fact, and matters of mere opinion were not admissible in evidence. The first witnesses, were to form opinion, and a large material exception had been defined upon this rule, and sanctioned within defined limits, the statement of opinion "as admissible in evidence. Where a case there was any question on any point of science or art, the "opinions" upon question or point, of persons specially called in such matters, were relevant facts. Words "science" or "art" included all acts upon which a course of special study or opinion was necessary to the formation of opinion, and it might be considered now the question that within this rule the evidence of physicians, surgeons, barristers, architects, engineers, surveyors and agents, scientists, experts in handwriting, and in ancient seals, were all comprised, and, in commercial matters, where commercial dealings were in question, the evidence of merchants or underwriters was now to some extent receivable—to what extent might still be in question, but the fact remained of its admissibility. The questions asked of an expert be questions of art or science. In two recently before the Lord Chief Justice, the question was as to handwriting, the judge in substance "advised the jury to accept the evidence of experts in handwriting in preference to their own considered judgment." The real use of such evidence "open the eyes" of a jury to differences otherwise might not be observed by lay persons. The evidence of experts not favourably regarded in our courts of law although it was not restricted as it is under French or the German code. Under the Napoleonic evidence of this kind was not admissible by the parties, but was in the nature of an advisory evidence to the court. In our own courts of Admiralty, in suits of damage and loss, the attendance of the Trinity Masters, were, of course, highly-skilled seamen, and obtained as a matter of course. On hearing the evidence, they advised on all points of a nautical kind or character, but the judge alone rested the actual decision. A model, an excellent one in the author's mind, was followed under the Judicature Act by Order 55, Rule 10: "The Judge in cases may, in such way as he thinks fit, obtain the assistance of accountants, valuers, engineers, actuaries, and other expert persons, the better to enable any party at once to be determined, and he may upon the certificate of any such person." This was actual judicial authority vested by Parliament in persons such as his. But that was not all, for under Order 57, the judge might sit in open court in cases with assessors—a rule which illustrated the practice of a common law to the Court of Admiralty. So great had the growth of expert evidence (so unfair, so easy, and apparently so dishonest) in cases that there was a broad and widespread opinion to adopt in the courts of the United Kingdom the French or German plan. In the case of *Taylor on Evidence*, a work of highest authority, it was said that the testimony of skilled witnesses is perhaps that which deserves least credit with a jury. Campbell, in the *Tracy Peerage Case*, that skilled witnesses came with such a "weight" that hardly any weight should be given to their evidence. The late Sir George Jessel, in *Anger v. Ashton*, 17 Equity Cases, p. 373, year 1884, speaking of experts said: "They (the

plaintiffs) contest the case by producing the evidence of some experts whose evidence was met by at least as many experts on the part of the defendants. As to this, I may say what I think I have often said before, that in matters of opinion I very much distrust expert evidence and for several reasons. In the first place, although the evidence is given upon oath, in point of fact the person knows he cannot be indicted for perjury, because it is only evidence as to a matter of opinion. So that you have not the authority of legal sanction. A dishonest man, knowing he could not be punished, might be inclined to indulge in extravagant assertions on an occasion that required it. Expert evidence of this kind is evidence of persons who sometimes live by their business, but in all cases are remunerated for their evidence. An expert is not like an ordinary witness who hopes to get his expenses but he is employed and paid in the sense of gain, being employed by the person who calls him." All these judicial dicta were of course general, and applied to experts of every kind and every class. They were endorsed by the opinion of Lord Westbury and by the late Sir Alexander Cockburn whilst the evidence in patent cases specially had called down the wrath of Mr. Justice Keble in *Nettlefold v. Reynolds* (L. T., vol. lxxv. p. 699) and of the Master of the Rolls in *Ungar v. Sugr*, 1892 (9 P. C. R. 113). As to Lord Campbell's dictum as to "bias," whilst there was something to be said for it, the case was overstated. Take the case of the surveyor, as an instance. It was his duty to see that no possible interest of his client, a claimant, however remote, was overlooked. In the same way it was the duty of the surveyor on the other side to exclude, so far as possible, those elements of value which were merely problematical, or visionary. That was the true explanation of those divergencies of view which called forth the ignorant censures of ignorant critics. Failing in his duty as to this, the surveyor was negligent. Whatever "bias" there might be could be tested by cross-examination. The "bias" of which Lord Campbell spoke appeared to the author to be a vanishing quantity. The observations of Sir George Jessel were not so strictly accurate as one might reasonably expect from so great a judge; it was not true to say that the witness to an "opinion" could not be indicted for perjury. He could be, and had been. The difficulty in obtaining a conviction might be great. The fact remained that in the *Queen v. Schlesinger* an expert witness was convicted of perjury (10 Q. B., 670). He did not see that the mere fact of payment need necessarily create suspicion as to honesty, though it furnished, of course, material for cross-examination. The observations of Sir George Jessel were too wide; they would cover the comments or observations of counsel. Sir George's testimony had been borne to the honesty of the evidence of valuers in the course of the proceedings of the Royal Commission on the Land Acts in Ireland. Wide generalisations were all very well, but in the author's judgment tribunals must trust to the integrity of those before them, whether as witnesses or counsel. He admitted the rôle of the professional witness to be a dangerous one. Of course it might be said the administration of an oath made all the difference. He did not concur to that extent. It was the practice to administer oaths to expert witnesses, but in point of law he believed this, strictly speaking, to be unnecessary.

Speaking of surveyors, a case was cited in a text book to show with what hesitation and doubt the evidence of surveyors should be received; it was a case of *Walters v. Thorn* (22 Bevan, 547). But that was a case which proved nothing of the kind when really examined. Whatever might be the difficulties that surrounded "evidence based upon mere opinion," the case against it was overstated, although every now and then cases undoubtedly did arise, which might fairly challenge the severest criticism. Cases of this kind were matters for professional discipline, and should be dealt with as such, through such disciplinary bodies as their own Institution, or that of the Engineers. In considering the qualification and skill they implicitly undertook to bring to their client's assistance, the author said that a man who entered upon the exercise of any public profession contracted to bring to its discharge, whatever it might be, honesty and integrity of course, and further, there was upon his part an implied warranty that he was skilled and reasonably competent for the task he undertook.

No one undertook more than this by the mere fact of employment. They might contract for more; they could not contract for less, and thus, whether their employment be to advise their client, as a trustee upon an advance to be made by way of mortgage or otherwise, or to give evidence and support their client in contested cases, in any circumstances where they were the adviser and their client was the advised, they were undoubtedly amenable to him in an action for "negligence." "Negligence" was a very convenient term, but what it meant was the neglect of some legal duty—not mere moral duty. A great writer had said, "a man may be indicted for not loving his neighbour as himself."

The author illustrated his meaning by several cases. In the first case a valuation was made on behalf of an intending mortgagee upon a property that at the moment of time when the advance was made was undeveloped, but where undoubtedly a latent building value existed. No development, in fact, taking place, the property was put up for sale, and failed to find a purchaser. Ultimately proceedings were taken against the surveyor upon whose advice and valuation the money had been advanced. A compromise was effected. Here the error arose from an over sanguine view of the ripeness of the estate for building, and possibly owing also to the fact of incorrect information. It was the case of an error of judgment merely. Another case was the *Law Guarantee Trust v. Boyes*. Upon a valuation estimating the value of certain premises at 17,000l., an advance of 12,000l. was in fact made. Very cogent and strong evidence was given to show that the property was not worth 17,000l. or anything like it, that it was not the proper security for any such sum as 12,000l., that at a forced sale the value was something over 7,000l., whilst to a willing purchaser the property might have been worth something over 9,000l. For the defendant, of course evidence was adduced to show the fairness of the estimate. In this case the jury found for the defendant, and rightly, although the figures were very wide apart. But in an issue of this kind, where the defendant was alleged to be negligent the "onus" was on the attacking party, and in the case to which he referred surveyors of at least equal ability were called on the part of the defendant, and where evidence was so equally balanced it could not be said fairly that an affirmative case of negligence was made out. In this case the building had actually cost 15,000l. exclusive of site. So far as the rental value was concerned, for the plaintiff a ten years' multiplier was suggested, for the defendant a twenty years' multiplier, and therefore they had the widest discrepancy between the two views. In conclusion, the author said that he had dealt with the subject for the purpose of showing that whilst in the witness-box expert evidence had been very widely criticised, often in ignorance of its true character, yet apart from that, the legislature had entrusted many important duties to experts in an advisory and even judicial sense, whilst the faith reposed in them by the public at large was of the widest and broadest character. So should be their responsibilities. Failure of duty, negligence, or ignorance rightly made them liable to those who retained them. This ignorance might spring from two principal sources, want of actual knowledge or want of experience.

Mr. Howard Martin proposed a vote of thanks to the lecturer, which was seconded by Mr. G. R. Crickmay.

A short discussion followed in which Messrs. Daniel Watney, George Corderoy and H. Northcroft, took part.

The vote of thanks having been agreed to, and Mr. Wheeler having replied, the meeting terminated.

STREET IMPROVEMENTS, KETTERING.—For the purpose of inquiring into an application for sanction to borrow 11,400l. for works of public and private street improvements, Mr. W. O. E. Meade-King, an inspector to the Local Government Board, held an inquiry at the Urban Council Chambers on the 9th inst. The plans were explained by the Surveyor, Mr. T. R. Smith, who pointed out that the public streets were part of Victoria-street and High-street, and the private streets were as follows: Lindsay, Canon, Club, Eskdale, Alfred, and Garfield-streets, Tennyson-road, York-road, St. Peter's-avenue, 40 ft. wide; Crown-street, Carlton-street, Green-lane, partly 40 ft. wide; Acre, Oxford, Lawson, Brook, Spencer, and Gratton-streets, 30 ft. in width.

THE LONDON COUNTY COUNCIL.

The last meeting of the present London County Council was held on Tuesday in the County Hall, Spring-gardens, Dr. Collins, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Poplar District Board 7,650*l.* for paving and sewer works, the St. Pancras Vestry 22,445*l.* for electric lighting purposes, and the Shore-ditch Vestry 4,100*l.* for underground conveniences.

The Works Department.—The same Committee reported as follows, the recommendations being agreed to:—

"We have had under consideration the charge which should be made to the Works Department for the year 1897-8 in respect of interest on, and repayment of, capital outlay at the Central Works. There are two classes of capital outlay which, in our opinion, should be treated somewhat differently, following in that respect the precedent of the last four years. The first is that of capital expenditure upon the site and permanent buildings of the Department up to March 31, 1897. The charge for this has been, and we think may continue to be, based upon the actual cost to the Council of the money raised. This amounts to 2,760*l.* 7*s.* 2*d.* for interest and 1,900*l.* 4*s.* 3*d.* for repayment of capital, or together 4,660*l.* 11*s.* 5*d.* The other class of capital outlay is of the nature of working capital, and is represented by the value of the stock of plant and materials in hand. We consider that this working capital might be regarded as being provided out of the proceeds of the issue of stock, and that the charge for interest should be approximately at the rate at which the Council raised stock during the year. The average value of the stock in hand throughout the year has been approximately 65,000*l.*, and the rate of interest should be 2½ per cent. The charge on this basis works out at 1,625*l.* We recommend—

(a) That the amount to be charged (in lieu of rent) to the Works Department for interest on and repayment of original capital outlay on the Central wharf and buildings for the year ending March 31, 1898, be 4,660*l.* 11*s.* 5*d.* (b) That the amount of interest to be charged to the Works Department on working capital during the year ending March 31, 1898, be 1,625*l.*"

The Housing of the Working Classes Committee reported as follows:—

"We submit plans, specification, quantities, and estimate for the block of dwellings to be erected on the site on the Boundary-street area facing Navarre-street which runs from the central open space to Boundary-street. Wargrave-buildings, as this block will be called, provides accommodation for 280 persons in sixty associated tenements, of which twenty contain three rooms, and forty two rooms. The estimate of the total cost of the buildings is 13,715*l.* 10*s.*, and the sum at which the necessary works are to be carried out is 12,920*l.*, which includes a sum of 23*l.* for the paving of yards chargeable to other buildings. We have supplied the Finance Committee with the estimates of receipts and outgoings, in order to enable them to make the necessary calculations as to the probable effect of the erection of the dwellings upon the county rate, and we anticipate an annual balance on the right side of 13*l.* The Works Manager has informed us that he is prepared to undertake the execution of the works at the amount of the architect's estimate, viz., 12,920*l.* We recommend—That the estimate of 13,715*l.* 10*s.* submitted by the Finance Committee in respect of the erection of Wargrave-buildings, Boundary-street area, be approved; that the work be executed by the Council without the intervention of a contractor, and that the plans, specification, quantities, and estimate of 12,920*l.* be referred to the Works Manager for that purpose."

Mr. E. White moved an amendment in favour of inviting tenders. Work of this character, when undertaken by the Works Department, had always resulted in a large loss to the ratepayers.

Lord Dunsen seconded the amendment.

The Rev. F. Williams, Mr. Goodman, and Mr. A. Smith supported the recommendation.

Upon a division the amendment was rejected by 58 votes to 45, and the recommendation was then agreed to.

Churchyard Bottom Wood.—The Parks and Open Spaces Committee recommended that the Council's contribution towards the cost of acquiring Churchyard Bottom Wood should be increased from the proposed sum of 2,500*l.* to 5,000*l.*

Colonel Rotton moved an amendment that the contribution should not exceed 2,500*l.*, on the ground that the land was outside the county of London, and that the Middlesex County Council, within whose borders the land was included, would only contribute 5,000*l.*

Mr. Campbell seconded the amendment. Upon a show of hands the amendment was

rejected by a very large majority. The recommendation was then agreed to.

The Gas Light and Coke Company.—Mr. McKinnon Wood moved that the Council should oppose the Gas Light and Coke Company's Bill, on the ground that the proposed conversion of stock would increase the capital value of the Company's undertaking by 1,000,000*l.*, and enable the Company to nominally reduce the dividend while increasing the charge to consumers.

Mr. Benn seconded the resolution, which was ultimately agreed to.

Lighting of Chief Fire Station by Electricity.—The Fire Brigade Committee recommended, and, after discussion, it was agreed to accept, the tender of the National Electric Free Wiring Company, Limited, to carry out the electric light installation at the chief station of the Fire Brigade for 92*l.*, less the amount of the wages of the Council's employees who will be engaged on part of the work.

Technical Education.—The Technical Education Board recommended the Council to approve of a sum of 170,000*l.* being placed upon the estimates to be set aside out of the sums receivable by the Council under the Local Taxation (Customs and Excise) Act, 1890, for the purposes of technical education for the year 1898-9. The recommendation was agreed to.

Housing of the Working Classes.—Upon the reception of a report of the Housing of the Working Classes Committee,

Dr. Longstaff moved an amendment to except from the reception of the report a statement of accounts, to the accuracy of which he demurred.

Mr. Beachcroft seconded the amendment.

A discussion followed, in the course of which Sir John Lubbock, M.P., was questioned as to the accuracy of his published statements with regard to the cost and results of the Council's work in the provision of artisans' dwellings. Sir John Lubbock admitted that he had somewhat understated the number of persons housed, but maintained that his main point was the check which the Council's action had imposed upon private enterprise.

Mr. A. Smith, Chairman of the Committee, said that up to March 31, 1897, the Council had in occupation dwellings erected and purchased at a cost, including all expenses of supervision, of 267,254*l.* There were at the date in course of erection further buildings estimated to cost 60,209*l.* Those, with one exception, had now been completed and occupied. The total expenditure up to December 31, 1897, on dwellings erected and in course of erection, was about 388,871*l.*, including the land. For that sum the Council had provided accommodation for 6,066 persons, and in addition there were seventeen shops, 100 workshops, twelve stables, and twenty sheds. Any comparison of the Council's buildings with those erected by trusts or companies upon the basis of rooms or persons was inaccurate, for the reason that no account was taken of the size of the rooms provided. It was notorious that the rooms in the Guinness buildings, for example, were much smaller than those provided by the Council. Frequent and diligent inquiries had shown that the cost per cubic foot of the Council's more recent dwellings was exceeded in many instances by that of dwellings erected by the trusts. Accepting as a basis of comparison the cost per cubic foot of building, or the cost per square foot of dwelling accommodation, it could easily be shown that the Council was building as cheaply, if not more cheaply, than the trusts, notwithstanding the Council's severe sanitary regulations and the rule that the rent charged must be that ruling in the neighbourhood, and must at the same time ensure a return of 3 per cent, and the necessity for setting a standard of accommodation. In several instances, the Council were under an obligation to build, private enterprise having failed to carry out the work. The Council's housing policy was no real burden to the rates, and the municipality sixty years hence would derive an annual income of 16,750*l.* from the sites.

The amendment having been lost, the report was received.

Workmen's Trains.—The Housing of the Working Classes Committee, in reference to cheap trains for artisans and others, recommended that their report be referred to the Parliamentary Committee to report, at an early date, as to the best steps to be taken with a view to amending the Cheap Trains Act, 1883,

and that a report upon workmen's services north of the Thames be prepared by the lines of the report of the services south of the Thames. This was agreed to.

Equipment of the Health Asylum, Bexley.—The Asylums Committee recommended, and it was agreed, that the estimate of 60,000*l.* submitted for the equipment, &c., of the Health Asylum, Bexley, be approved.

Vauxhall Bridge.—The Bridges Committee brought up the following report, the recommendation being agreed to:—

"1. Since the passing of the Act authorising the construction of a new bridge at Vauxhall, the Council has engaged our continued attention, and the Engineer has on various occasions prepared more or less finished drawings and designs, but an equal number of half-sized and full-sized sketches of details, upon all of which we have deliberated up to July last, when we placed before the Council a design which we were asked to reconsider, and assumed that the structure should take the form of a bridge with granite piers and steel arches, placing before the Council a bridge design of these lines, great difficulty was experienced in attempting to reconcile the various ideas on matters of taste which prevailed; but we believe that to any steel bridge were founded our design, whether in iron or steel arches, should present those features of stability and masonry structure alone could produce. It perhaps, be as well to remind the Council here that certain engineering and structural difficulties have to be overcome. The ground on both sides of the river is low, but the bridge has to be made to carry the traffic to the east, the easy grade mentioned in the Act of Parliament, namely, 1 in 40. This is very different from the present level, which has a gradient of 1 in 357. Then, the traffic beneath the bridge must be considered proper headways and narrow piers must be provided so that the tide-way shall not be interrupted, the existing structure having for years been a danger to navigation. All these matters to be considered and combined in a satisfactory design, and in respect of the latter the design submitted to the Thames Conservancy and they have approved of the piers, waterways, and headways which we now suggest should be adopted by the Council. Since the last design for a steel bridge was rejected in July, 1897, the Engineer has given the subject his undivided attention, and has endeavoured, within the limits imposed upon him by the estimate, to meet the views of the parties by preparing a design which will give, as can be expected, general satisfaction. A mature deliberation and a visit to similar structures in the Continent, and conferring with the Engineer engaged in their construction, has resulted in a design embodying the principle on which his predecessor constructed the Thames Embankment, namely, a granite bridge backed with concrete. This should be adopted the structure would be the appearance of a granite bridge, and the cost of it being erected like Waterloo Bridge, it would allow the heavy loads to pass over it, and would not necessitate the annual expense of painting work on the basis of our existing bridges, would cost at least 1,000*l.* per annum. The structure would also be practically permanent. Similar bridges have been constructed over the Danube and the Rhine, and the spans than those proposed at Vauxhall, and been tested in the most severe manner by passing over them locomotive engines weighing as much as 78 tons. . . . The bridge will be a five-arch structure supported by four piers and suitable masonry, as shown upon the drawings and model. The central span will be 149 ft. 9 in., the two intermediate spans 144 ft. 6 in. each, and the two end spans 130 ft. 6 in. each in width. An appearance of stability and massiveness is obtained by the use of rock-faced granite in the arches and piers of the bridge, but it is somewhat difficult to render the bridge of the dimensions required at Vauxhall architecturally imposing, as it is a structure 750 ft. in length, and only 28 ft. in height at the Trinity high-water mark. With regard to this, it has been agreed that some feature shall be introduced which will break up the long line of parapet, and the Chief Engineer has endeavoured to do this in a manner which has proved successful in a similar bridge over the Jura in Geneva, the introduction of which will ultimately carry the lamps for illumination of the roadway and the river. At present it is proposed that the bridge shall be faced with red and grey granite of various tints such a manner as to bring out the features of the work in pleasing relief. The bronze lamp supports and details for the top or finials of the piers are indicated in a general way upon the sketch, but may be modified if the general structure approved by the Council. An amount has been set aside for the ornamentation of the bridge, and, however, do not propose to leave the pedestals filled, but intend to deal with this matter at a later report after the Council has approved the general design. In deliberating upon this, we have had the benefit of the advice of

entlemen who objected to the proposed steel arch bridge, and in presenting the present design we believe that, if the bridge were constructed in accordance therewith, it would prove to be one of the handsomest bridges over the Thames. The Parliamentary estimate for the cost of the bridge was £38,000. By the adoption of the present design a saving of probably 20,000l. will be effected, and a much more permanent structure secured. We therefore recommend—that the design submitted for the bridge to be erected in the place of the present structure at Vauxhall be adopted, and that the Engineer be instructed to prepare the necessary contract, plans, sections, and specifications."

Enlargement, &c., of Battersea Fire Station.—The Fire Brigade Committee recommended, and it was agreed, that the estimate of 5,095l. to be submitted by the Finance Committee in respect of the enlargement and alteration of the Battersea fire-engine station be approved. That the tender of Mr. C. F. Kearley to enlarge and alter the Battersea fire-engine station for 4,895l. be accepted, subject to Mr. Kearley completing the bills of quantities to the Architect's satisfaction.

Russell-court Improvement.—The Highways Committee recommended, and it was agreed, that the estimate for 2,000l. submitted by the Finance Committee be approved; that the solicitor do prepare and obtain the execution of an agreement with the Duke of Bedford for the construction by him or his trustees, to the satisfaction of the Council's Chief Engineer, of a subway, with side passages, under the new street about to be formed between Catherine-street and Drury-lane, and for the actual cost of the subway, as ascertained by the comptroller, being repaid by the Council.

Sewer, Hamilton-road, Norwood.—On the 19th inst. the Council accepted the tender of Mr. Thomas Adams, amounting to 2,145l. 11s. 3d., for the construction of a new sewer along the Hamilton-road, West Norwood. Mr. Adams, however, on the next day wrote to the Council as follows:—"I understood Messrs. Jackson & Son's tender had been accepted for this work, and not having received any official intimation from your Council since the delivery of my tender on January 25 last, I have since entered into several large contracts which will keep me fully engaged for at least six or nine months—in fact I may say until the end of this year; so that if the above report is true, I would not be in position to commence the work for some months."

On Tuesday it was recommended that the tender of Messrs. John Mowlem & Co., amounting to 2,504l. 5s. 6d., the next lowest tender, be accepted. The recommendation was not adopted, and after some discussion it was agreed that the work should be carried out by the Works Department.

The Main Drainage Committee also reported as follows, the recommendation, after discussion, being agreed to:—

"As regards the explanation given by Mr. Adams not proceeding with the work immediately, we cannot consider it satisfactory, and we have come to the conclusion that the Council should show its disapproval of the course taken by not allowing him to tender for the Council's work in future. The tenders were, as already stated, opened by the Council on January 25, and our recommendation that Mr. Adams' tender be accepted was before the Council at its next meeting on February 1. The consideration of the recommendation was then postponed, but as it was adopted at the subsequent meeting, a period of fourteen days only elapsed between the opening and the acceptance of the tender. Moreover, as Mr. Adams' tender was the lowest, and Messrs. Jackson & Son's informal tender was not published, there was no reason why he should think that his tender would not be accepted. Having regard to standing order 207, we recommend that in future Mr. Thomas Adams be not allowed to tender for any work for the Council."

Victoria Embankment Extension.—The Parliamentary Committee recommended, and it was agreed, that the Parliamentary agent be instructed to take such steps as he may consider necessary to secure opposition to the second reading of the Victoria Embankment Extension and St. John's Improvement Bill.

Proposed Theatre, Hackney.—The Theatres and Music Halls Committee reported as follows, the recommendation being agreed to:—

"We have considered eight drawings, dated February 11, 1898, submitted on behalf of Mr. Randall Andrews, in regard to a theatre which it is proposed to erect in Mare-street, Hackney. The site of the building, which will accommodate 1,271 persons, may be accepted as satisfactory, although it does not strictly comply with the regulations.

We recommend that the eight drawings, dated February 11, 1898, in regard to the proposed theatre in Mare-street, Hackney, be approved on condition that the works be commenced within six months, and be carried out in all respects in accordance with the regulations of the Council and the provisions of the London Building Act, 1894, and that upon our reporting the completion of the building in accordance with the approved drawings and the above condition a certificate under the Metropolitan Management and Building Acts Amendment Act, 1878, be sealed and issued to the owner of the premises.

Deviation from Plans certified by the District Surveyor under Section 43 of the London Building Act.—The Building Act Committee reported as follows, the recommendation being agreed to:—

"Notice of objection under Sections 43 and 150 of the London Building Act was served by the District Surveyor upon the building owner of Nos. 12 and 13, Grafton-street, St. George, Hanover-square, in respect of certain deviations from the plans certified by the District Surveyor under the first-named section in the erection, without the Council's sanction, of a building of greater height than the buildings previously upon the site. Against this notice the owner appealed both to a magistrate and to the Tribunal of Appeal. When, however, the case came before the magistrate the hearing was, at the request of the owner, adjourned, in order that his appeal to the Tribunal might be taken first. The case was before the Tribunal on January 10, when, after hearing arguments, the Tribunal held that the notice served by the District Surveyor was not a decision under Section 43 of the Act, and that therefore the Tribunal had no jurisdiction in the matter. The case was again taken before the magistrate, who, after three days' hearing, decided on February 3 that the view taken by the Council was right, and that Section 43 did not allow a builder, without having previously obtained the Council's sanction, to deviate in any respect from the certified plans, even if no more ground be covered than was previously occupied; and that therefore the present owner could not without such sanction erect his new building, as he proposed to do, of greater height than the old building. The magistrate accordingly confirmed the District Surveyor's notice of objection, and ordered the building owner to pay to the Council 10l. 10s. as costs. We are informed that the building owner intends to appeal against this decision, and, having regard to the great importance of the question involved, we recommend that the Solicitor do take the necessary measures for upholding in the High Court the decision of the magistrate confirming the District Surveyor's notice of objection under Sections 43 and 150 of the London Building Act, 1894, with regard to deviation from the certified plans in the erection of a building on the site formerly occupied by Nos. 10 and 12, Grafton-street, St. George, Hanover-square."

The Council adjourned at 8.30 p.m.

THE SANITARY INSPECTORS' ASSOCIATION.

THE fifteenth annual dinner of this Association took place on Saturday last at the Holborn Restaurant, the President, Sir John Hutton, occupying the chair, and the Chairman of Council (Mr. Dee), with the past Chairmen and leading members of the Council, in the vice-chairs. Over 200 members and visitors sat down, among those near the President being Sir Walter Foster, M.P., Sir J. Crichton Browne, the Venerable Archdeacon Sinclair, Dr. Harris, Dr. Milson Rhodes (hon. member, Lancashire and Cheshire Branch), Dr. Mansfield Robinson (Shoreditch Local Board), Professor Alfred Professor Crookshank, Mr. C. Macmahon (Western Branch), &c.

In the after-dinner proceedings Sir Walter Foster, responding to the toast of "The Houses of Parliament," said he regarded it as one of the duties of Parliament to help an association like that of the Sanitary Inspectors to realise its objects, and to further its interests. They were entitled to ask Parliament to strengthen their position and improve their fortunes, and he hoped the House of Commons would aid them in their work.

The toast of the evening, "Success to the Sanitary Inspectors' Association," was proposed by the President. He said the past year had not been a particularly eventful one, but owing to the fact that the Association was not limited to London it had prospered in all its branches, and its roll of over 700 members proved that the Association was valued throughout the land. One of their advantages was the possession of an admirable journal, which was invaluable to those seeking information on sanitary matters. He hoped the coming year

would see a further increase in the public appreciation of the work of the sanitary inspector. In London, with 4,450,000 of population and only 200 inspectors, one saw how totally inadequate—excellent and capable as these officers were—must be their means of grappling with so large a population. The number of houses in London was 600,000, and, therefore, each inspector had on the average 25,000 of population and 3,000 houses between which he must divide his attention. In one of the poorer districts of London, which contained a large proportion of tenement houses, there were four inspectors who had 70,000 persons under their charge, and such districts, of course, required more attention from the sanitary inspector than more highly rented districts. One was astonished at the poverty of the remuneration these men received. If they desired—and all must do so—to attract men of great ability, with the learning necessary to a proper fulfilment of their duties, they must remunerate them on a higher scale. County Councils had, under certain circumstances, authority to pay a portion of these salaries, and it was a question to be seriously considered how to enable Local Authorities to better remunerate such men as they desired to attract to this service. The faithful sanitary inspectors must necessarily make enemies, because their highest duty was to see right and justice done.

Other toasts followed, to Education, Local Government, Science and Art, the Visitors, the Executive, and the Press, and in the course of the proceedings testimonials of the respect and esteem of the members for two of their colleagues, who had served the Association long, devotedly, and efficiently, were presented. To Mr. C. W. Raymond, who for fourteen years had fulfilled the duties of honorary treasurer, an illuminated address, and a gold watch suitably inscribed, were presented by the President; and to Mr. W. W. West, the Chairman of Council in 1896 and 1897, a similar address and a writing-case.

FURNITURE: PAST AND PRESENT.

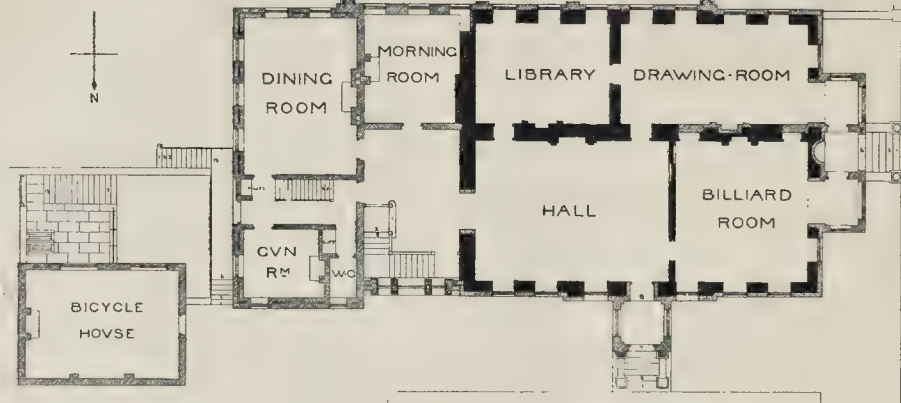
A PAPER ON "Furniture: Past and Present" was read before the members of the Auctioneers' Institute on Tuesday evening by Mr. W. Roland Peck, the chair being occupied by Mr. J. F. Field, President of the Institute.

The lecturer attributed to the grouping together of famous artificers by the first Master Mason, nearly 3,000 years ago, the earliest evidences of style and workmanship; and some of the finest existing examples of art probably owed their origin to the influence and genius of the first Master of Freemasons. The subject was treated historically by Mr. Peck, beginning with the oldest and most venerable piece of furniture at present known, the chair of Queen Hatasu, who reigned in the Nile Valley sixteen centuries before the Christian era, through the primitive appointments of pre-Norman times in this country, to the historic collection belonging to the fourteenth century still preserved at Penshurst Place in Kent—the ornate and beautiful furniture of the Elizabethan period, the excellence of which was attributed chiefly to the encouragement to foreign artificers given by Henry VIII.—and the further advances shown in the later Stuart period, due very materially to the thousands of skilled workmen driven from France after the revocation of the Edict of Nantes (1689). The highest place in the history of English furniture was accorded to Chippendale (George II.), the solidity and superior finish of whose workmanship, said the lecturer, are examples for all time. The nineteenth century had no style of its own, and the Victorian era, though it had given us railways, telegraphs, telephones, and other wonders, had produced nothing really original in furniture, with the possible exception of a few pieces by William Morris. The paper concluded with a contrast between the small prices brought under the hammer, fifty years ago, when a veritable Boule armoire brought but 21l., and the high prices paid recently for such objects, which ranged from 4,000l. to 6,000l.

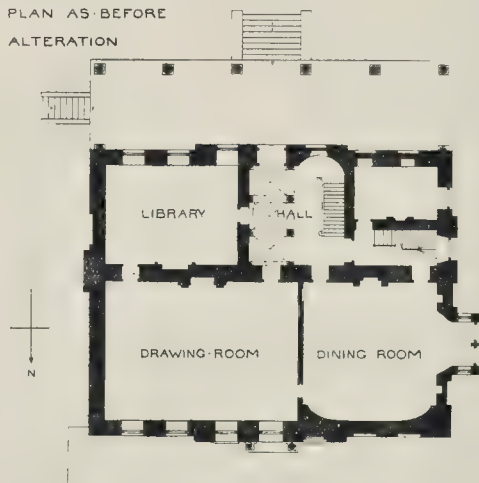
FISH HATCHERY, ABERDEEN.—The Scotch Fishery Board, having resolved to remove their fish hatchery from Dunbar to Aberdeen, have fixed the new site at Bay of Nigg. Mr. John Rust, City Architect, Aberdeen, has been appointed by the Fishery Board as architect for the new premises, which will include a covered tank 90 ft. by 25 ft. and 8 ft. deep, a laboratory, and a museum.

HEATHFIELD PARK
W.C. ALEXANDER Esq
PLAN AS ENLARGED & ALTERED

SCALE
0 10 20 30 40



HEATHFIELD PARK W.C. ALEXANDER Esq
PLAN AS BEFORE
ALTERATION



"Heathfield Park": South Elevation previous to Alterations.

DRAWINGS FOR THE ROYAL
ACADEMY.

As usual, we shall be glad to receive and deliver at the Royal Academy all drawings intended for the Architectural Room which are sent to us in time to be photographed for publication before sending in.

The last day for receiving drawings at the Academy is Monday, March 28, and we can receive none at this office later than 12 noon on Saturday, March 26.

Every drawing must have two labels giving the title of the work and the name and address of the author, one affixed to the back of the drawing, and the other attached by a string so as to hang over in front of the drawing, and must be accompanied by a letter to the Secretary of the Royal Academy, giving also the title of the work and the name and address of the author. If more works than one are sent they must be numbered, and referred to by the corresponding numbers in the letter to the Secretary.

Gilt frames only are admissible at the Royal Academy.

We cannot provide labels for drawings which are sent without them.

Illustrations.

NEW REREDOS, BRISTOL CATHEDRAL.

HIS reredos, now being executed, is an elaborate structure in stone of a size and importance worthy of the cathedral; it is upwards of 17 ft. wide, and rises to a total height of 27 ft. from the floor of the sanctuary. The lower part, behind and above the altar, is plain, with a tall centre panel to enclose the altar cross; on either side of the upper half of this panel is an enriched arcade of five divisions containing sculpture. Above this lower part the centre portion (which takes the width of the altar and is about 10 ft. wide) is corbelled boldly forward, and to the right and left of this there are enrichments, from the floor upwards, of traceried panelling surmounted by niches with figures of Old Testament Saints on the left and New Testament Saints on the right.

Above the level of the top of the corbelling above mentioned, the whole of the reredos has one general treatment of wide niches in one, two, and three tiers, with canopies and pinna-

cles separated by narrower features, also enriched with niches and sculpture. The Crucifixion, with St. Mary and St. John, will occupy the centre niche. Other niches contain figures of saints and angels with their emblems.

The lower part of the back or eastern side of the reredos is quite plain up to a height of 7 ft. above this level it is richly panelled up to a height of 14 ft., and above this buttresses divide it into a series of niches; the centre niche will contain a representation of the Presentation in the Temple, and on either side St. Mary and the Archangel Gabriel (representing the Annunciation); other niches will contain figures of saints and angels.

A panelled and traceried screen, 11 ft. high, with buttresses and pinnacles, separates the eastern bay of the choir from its eastern chapel, flanking the reredos on either side.

The reredos was designed by the late J. L. Pearson, R.A., and is being carried out under the supervision of his son, Mr. F. L. Pearson.

"HEATHFIELD PARK," SUSSEX.

This house was originally called Baily Park, and was sold by Thomas Lord Dacre to Hercules Poulett in 1674, who again sold it to James Plumer, citizen of London. A stone which was excavated during the recent works states that Plumer "laid ye first stone, Aug. 3, 1677." Remains however of a sixteenth century house were discovered; and it appears that Plumer left part of the basement of the old house above it. Plumer's house was a substantial building in fine brickwork and stone dressings, in the manner which has been followed in the building as recently completed: After passing in turn through the hands of

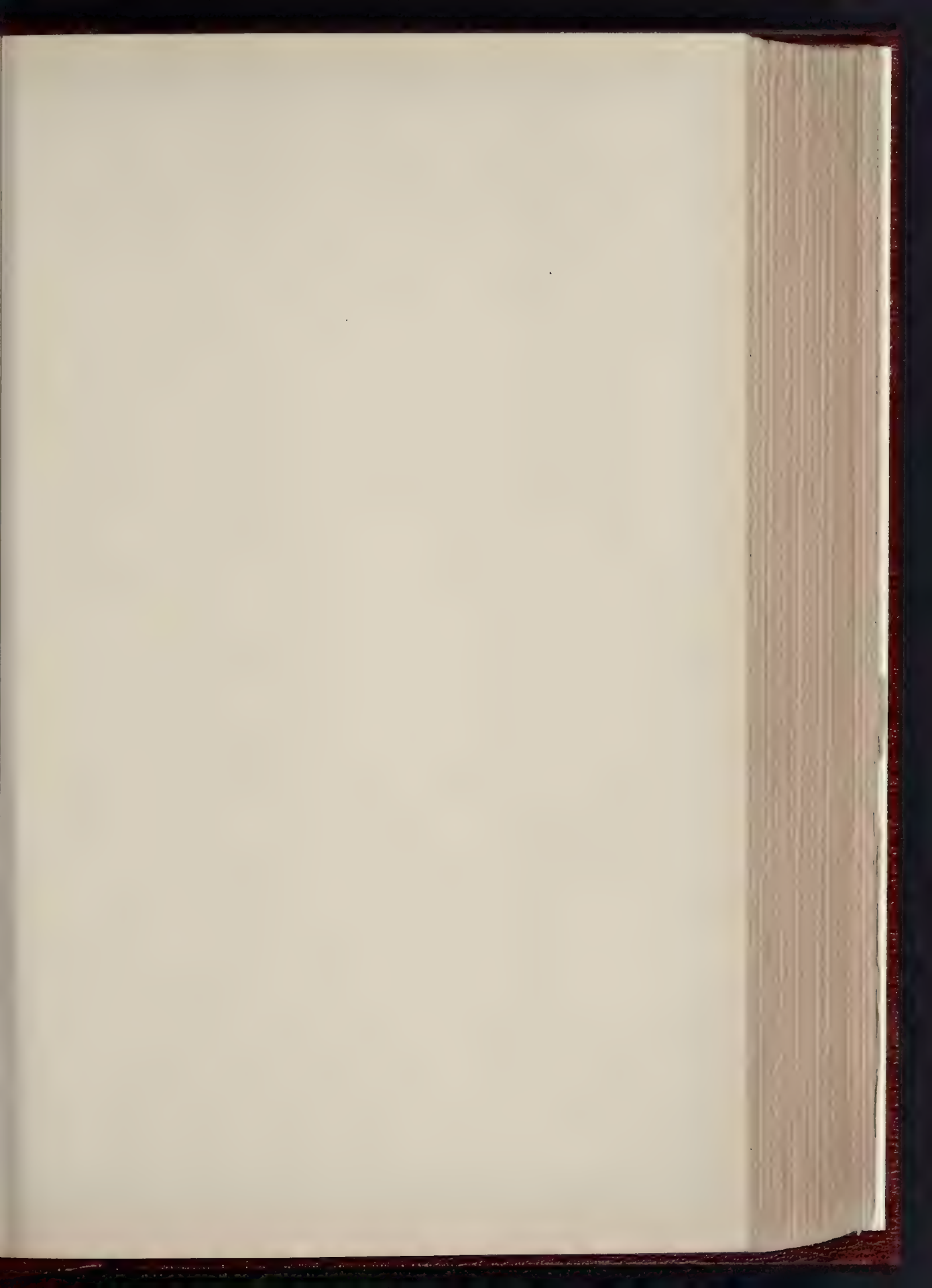


THE BUILDER, FEBRUARY 26, 1898.

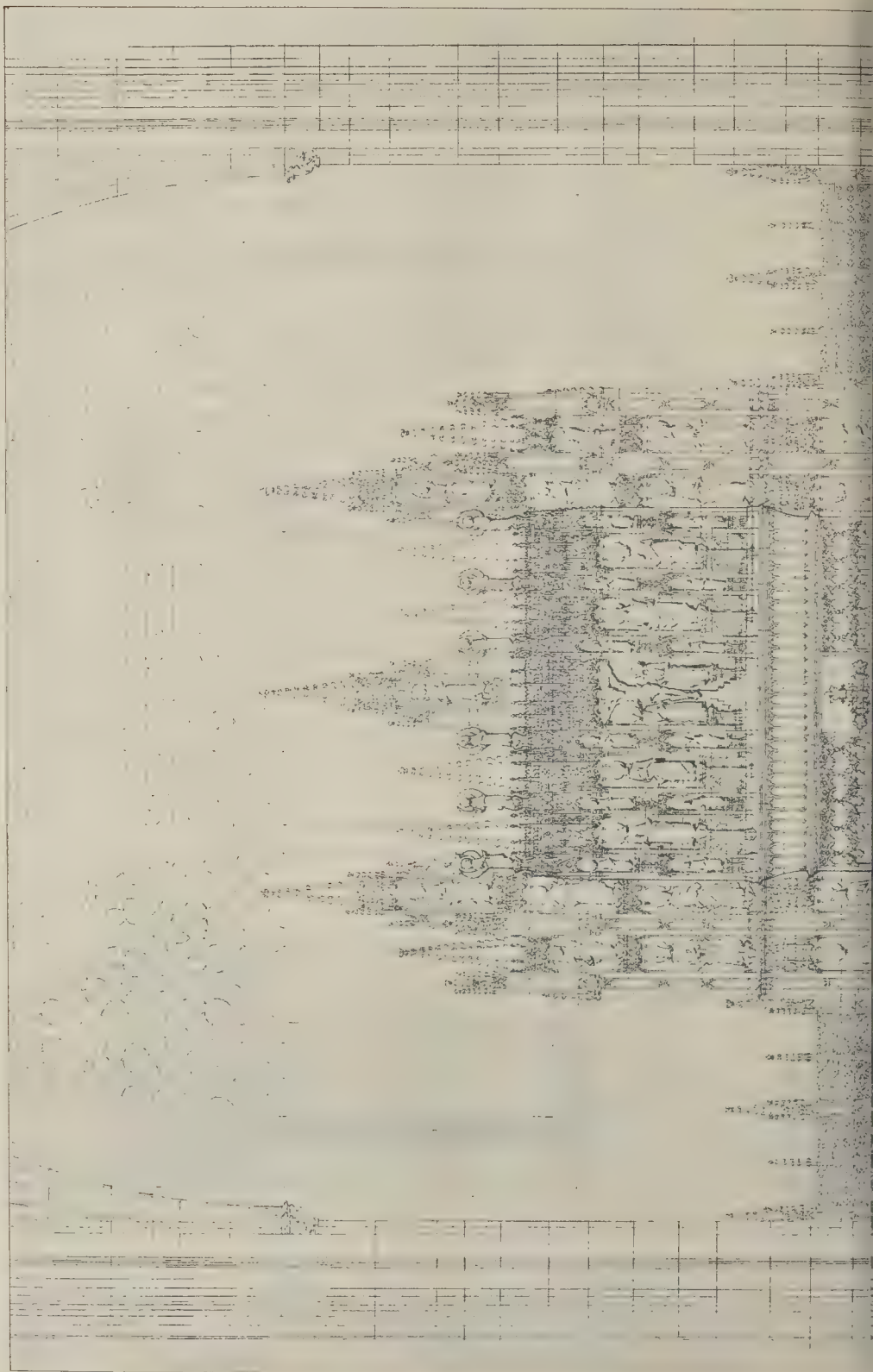




"KINGSWOOD," SYDENHAM HILL: AS ALTERED AND ENLARGED. MR. H. V. LANCASTER, A.R.I.B.A., ARCHITECT.



THE BUILDER. FEBRUARY 26, 1898.





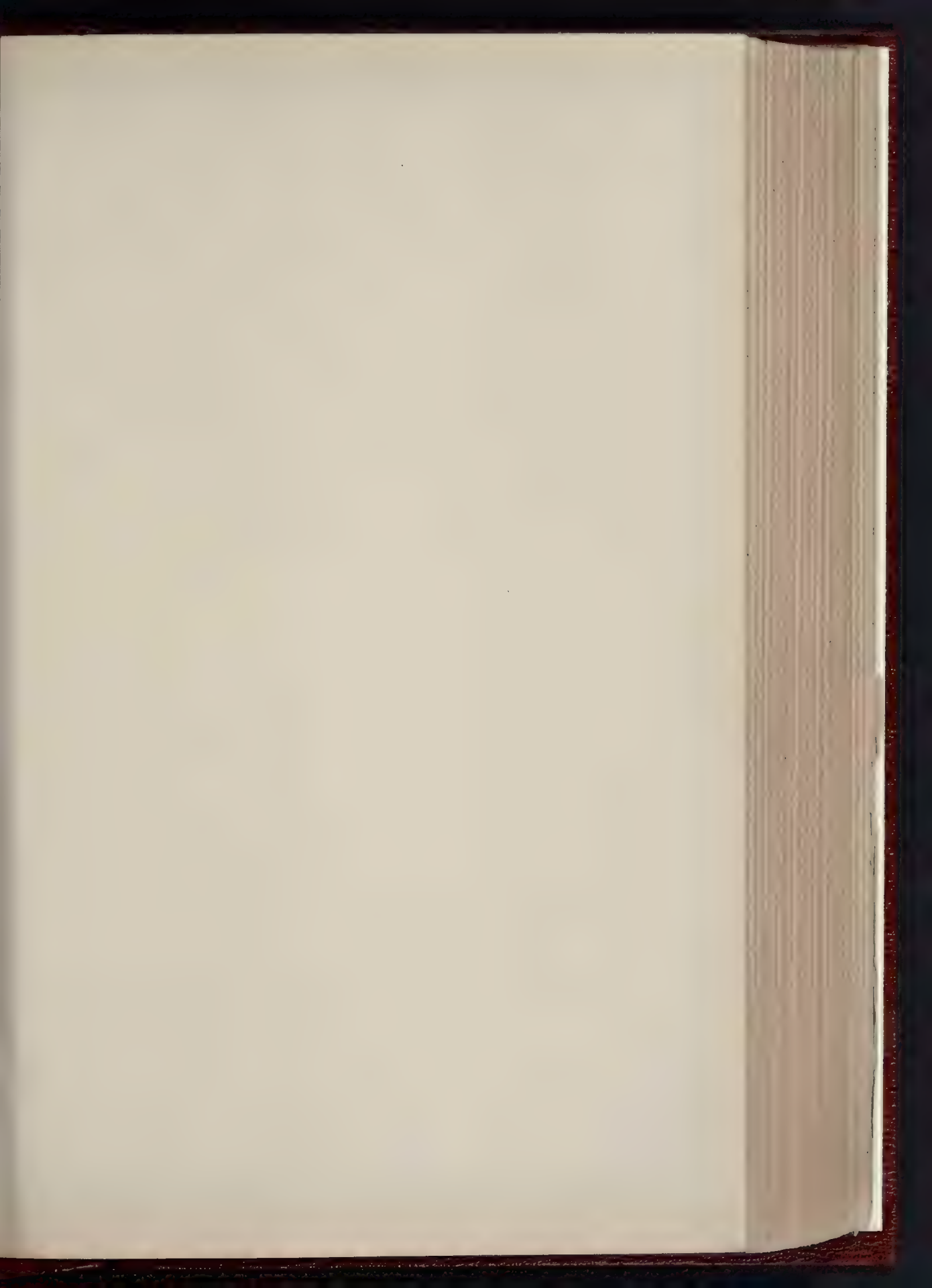
INCHES 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 FEET

SCALE OF FEET

PROPOSED REREDOS FOR BRISTOL CATHEDRAL

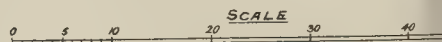


PROPOSED REREDOS FOR BRISTOL CATHEDRAL. DESIGNED BY THE LATE J. L. PEARSON, R.A.



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GROUND PLAN.



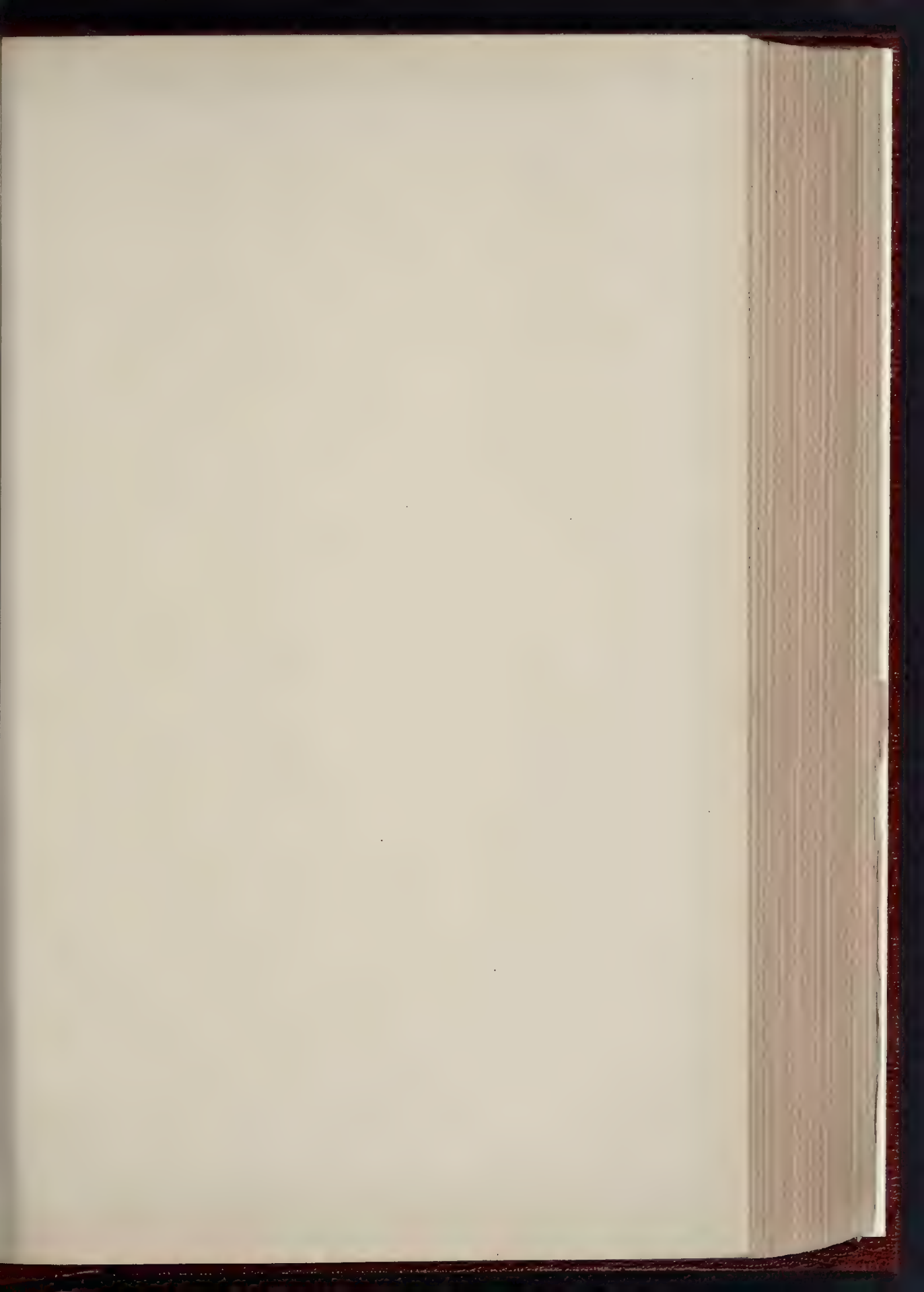
COUNTRY CHURCH.
VARDELL.

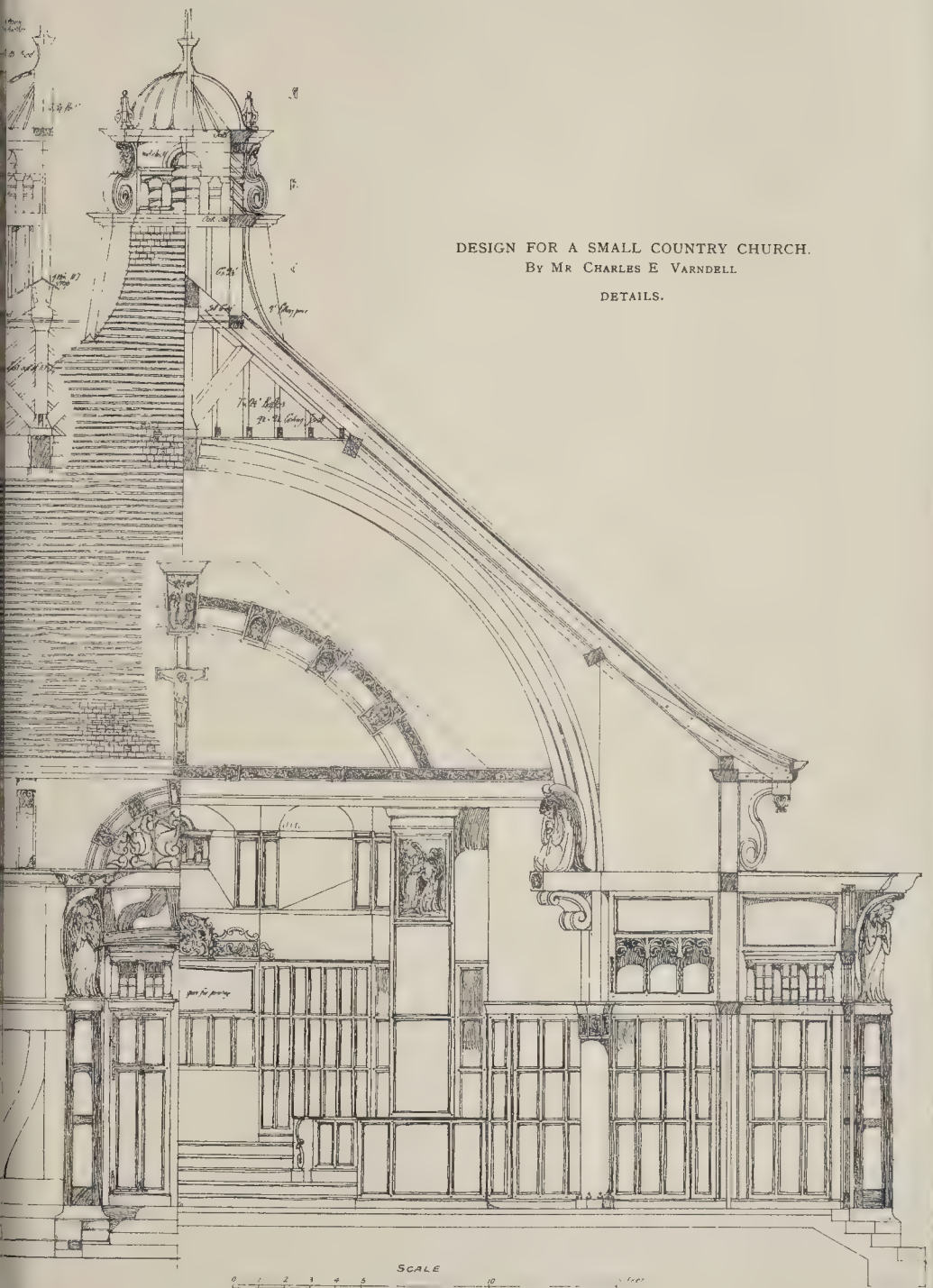


ENTRANCE FRONT.



SECTION A A.





James Fuller, of Waldron, Raymond Blackmore and a family named O'Keefe, it was purchased in 1766 by Lieut. Gen. Elliott, afterwards Lord Heathfield of Gibraltar, and was sold by his son to Francis Newberry, of St. Paul's-churchyard. The property was again sold to Sir C. R. Blunt in 1819, who sold it to Mr. Scott, of whom it was purchased by the present owner, Mr. W. C. Alexander, in 1894. Towards the end of the eighteenth century the old brickwork was entirely covered with stucco. The old stone dressings and certain niches between the windows of Plumer's house were hacked about to give a key to the cement, and a balustrade, pediments, and other details of a very inferior description carried out in cement and all painted white. The roof was of Welsh slates with a lead flat. Certain interior decorations, including the hall arcade shown in the old plan, were carried out about the time that the property came into the hands of the Blunts. The house was in this condition when the recent works were undertaken.

These works include a large addition to the east, the re-arrangement of the interior and entirely new elevations, a new terrace and alteration of the grounds, and very considerable repairs. The old external walls were much out of the perpendicular, and, with the exception of the facing of the seventeenth century brickwork, were very badly built, and stood merely by their bulk. This brickwork had been so much injured by hacking away for the stucco, that it was found necessary to remove it and reface the entire building with brickwork in cement, and advantage was taken of this opportunity to re-design the elevations. Several of the old binders were found to be entirely decayed at their bearings, and steel joists had to be substituted. The cement balustrades, cornices, and pediments were removed and replaced by a new wood cornice, dormers, and tile roof. Various alterations have been made in the interior, the most important being the shifting of the entrance from the south side to the north, the removal of the old hall and staircase, the formation of new main and back stairs and various rooms, and of a new drawing-room in the south-west corner. The old drawing-room is now the entrance hall. In consequence of the additions and in order to get a symmetrical facade on the south side, the old loggia was taken down and re-erected in the centre of the south facade, and the ground on this side has been lowered to the new terrace garden. The new buildings are executed in Keymer red bricks with rubbed brick and local stone dressings and Keymer tiles. The additions are hatched in the plan of the house as altered.

The works were carried out in 1896 and 1897 by Messrs. Bovis & Co. from the designs, and under the superintendence of Mr. Reginald Blomfield.

"KINGSWOOD," SYDENHAM HILL.

This house consists largely of the remodeling and refronting of an existing one, so that the general lines of the composition were, in a great measure, determined, while the most important additions, including the large hall and entrance, are on the opposite side to that shown in the view.

The new conservatory forms a wing balancing an existing one at the further end.

Other additions have been recently made to the building.

H. V. LANCHESTER.

DESIGN FOR A SMALL COUNTRY CHURCH.

This design, by Mr. Chas. E. Varndell, was sent in to the Institute of Architects in competition for the Grissell Medal, under the motto "Emce," and was noticed in our review of the Institute prize drawings (*Builder*, January 22) as one of the best designs sent in, and as far as artistic feeling and invention are concerned we are inclined to think it was the best. The plan is cleverly contrived, and there is a great deal of freedom and effectiveness in the decorative details.

There may have been one or two points which interfered with its selection for the medal. The design was for a timber church, and the Grissell Medal is essentially a prize for constructional work, for which reason the selection of a church as the subject was perhaps not a very good one, as it is impossible to regard a church as a mere construction, and one would not wish to encourage young architects to do so. But from the constructional point of view

the treatment of the diagonal trusses, with their scarfed connexions dependent so largely on bolts, and their rather weak-looking impost, is not quite satisfactory; and the circular treatment of the windows, with voussiors (or what take that form) intercepting the archivolt mouldings, is rather an imitation of stone design than a proper form of timber design.

But in spite of these drawbacks, the design is on the whole a highly meritorious one as a student's work, and we have much pleasure in publishing it.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A METROPOLITAN District meeting of the Association of Municipal and County Engineers was held at the Institution of Civil Engineers, Westminster, on Friday last week. Mr. C. H. Lowe, Hampstead, vice-president, occupied the chair in the unavoidable absence of Sir Alexander Binnie, and amongst those present were Messrs. W. Weaver, Kensington; W. N. Blair, St. Pancras; J. S. Norrington, Lambeth; J. T. Eayrs, Birmingham; E. Pritchard, Birmingham; J. Price, Birmingham; Read, Gloucester; J. C. Radford, Putney; T. Cole, Westminster, Secretary; Martin, Streatham; P. Dodd, Wandsworth; C. G. Lawson, Southgate; Davis, Hounslow; L. Angell, West Ham; Cooper, Wimbledon; Southam, Clapham; and others.

Superannuation.

Mr. Weaver, C.E., Surveyor to the Kensington Vestry, introduced the question of superannuation, as affected by the proposed Bill to extend the provisions of the Poor Law Officers' Superannuation Act, 1896, to the officers and servants of other Local Authorities, and the proposed Bill to amend the Metropolitan Officers' Superannuation Act, 1866. He said the first Bill applied to the whole country, and proposed to make all officers and servants appointed by any Board entitled to a superannuation allowance. The second Bill promoted by the Metropolitan Officers' Association proposed to convert the word "may" into the word "shall" in the Superannuation Act of 1866. Of course, the Association would only be too glad to see the benefits of superannuation extended to the whole of the officers throughout the country; but at the same time the Council had come to the conclusion that there was no chance of the larger Bill, but there was a good chance of the smaller Bill for the metropolis, going through Parliament. Probably the feeling of the meeting would be to support the larger measure so long as they thought there was any chance of its going through Parliament, and in default of that to press forward the smaller Bill to the best of their ability.

After a short discussion, in which the general opinion of the members was in favour of supporting both Bills, Mr. Price, Birmingham, moved resolution to that effect, which was seconded by Mr. Davis, Hounslow, and adopted.

Combined Drainage.

Mr. W. Nisbet Blair, St. Pancras, then referred to the proposed Bill to amend the Metropolis Management Acts with respect to sewers and drains. He said the only difference between the Bill which had been introduced this session and the Bill of previous sessions was a clause to meet the opposition of Mr. Boulnois on behalf of Marylebone. The opposition to the original Bill had been most strenuously maintained by the Vestry of Marylebone, and the provision giving the London County Council power to approve of combined drains where desirable had been put in with a view of preventing their opposition this session. He believed there was every prospect now of the Bill being carried through. It was true there would be a strong opposition by owners of property, who were beginning to realise what an economy it was that these drains should be handed over to the Local Authority. The authorities had to spend thousands of pounds a year in this particular work. Owners knew that, and would be loth to bear the burden they ought to bear; but he did not think vested interests of that kind should induce Parliament to withdraw so manifestly justifiable an Act.

Mr. Lewis Angell, West Ham, said he wished success to Mr. Blair's hopes, but he was afraid he was doomed to disappointment. Personally, he thought there was little prospect of the Bill getting through the House of Commons. The

Bill had always been blocked because it was to the interest of property owners that things should remain as they were.

The Chairman stated that there would not be a resolution submitted to the meeting on this subject—the difficulty of which was well understood by every Metropolitan Member.

Sewer Ventilation.

The Chairman then introduced the subject of the proposed Conference of Metropolitan Surveyors called to consider the question of sewer ventilation. He said he was anxious this question should be brought before the Association because that day week they would be before their President, Sir A. Binnie, to consider the question as a whole. It was a very vexed question, and it was almost impossible to generalise or to apply rules which would be applicable to the whole of London. That was their difficulty in coming to any decision, but they were all anxious that some practical results should come from their meeting on Friday. He thought possibly no suburban district had given more attention to this question than Hampstead. They lay particularly high, and the theory was started, as long ago as 1877, that they were suffering unduly from the up current in the sewers from London proper. They had complaints both sentimental and real. The complaints went on until 1886, when the Vestry, being still troubled by these complaints, called in Mr. Mansergh to advise them. Mr. Mansergh recommended open ventilation in the streets, the ventilators not to be more than sixty yards apart. The Vestry followed out Mr. Mansergh's recommendation, and spent a large sum of money, running to 2,000, or 3,000, in supplying automatic flushing tanks and putting ventilators in. This had the effect of stopping many of the complaints. Now they had come to the source of the evil and the cause why they were troubled more with complaints where modern drains had been put into the houses. They had been able to localise the complaints so much as to prove that what was required was extra means for flushing the house drains. The use of intercepting traps on the drains caused the water to trickle through the trap without clearing it, and when an extra flush cleared the traps smells were caused in the sewers.

Mr. W. Weaver, Kensington, said that in his annual report to his Vestry he expressed the opinion that the growing complaint of smells in the public streets was to be attributed to the advance of sanitation in the houses. A suggestion in that report was that the Vestry should send a communication to the London County Council, asking them to call a conference of the various Metropolitan Surveyors to thresh out this question, assisted by the Chief Engineer of the Council, Sir A. Binnie. The suggestion was promptly acceded to by the Council, and Sir Alexander Binnie had appointed that day week at Spring Gardens for the Metropolitan Surveyors to confer with him. At the same time, the Medical Officers of Health of the various Boards had been appointed as delegates to the meeting. They would see that, with an equal representation of surveyors and medical officers, if there was any great diversity of opinion amongst the surveyors they would be outvoted and sat upon by the medical officers. It was in view of this conference that this subject was put down for discussion at that meeting, so that they might, if possible, thresh out and adjust any differences which existed amongst themselves. His own opinion, which he had expressed for years, was that syphon traps were bad in theory, and would have a bad result in practice. The subsequent experience he had gained had confirmed the opinion he had expressed upon their introduction. Smells in the streets had increased in direct proportion to the reconstruction on modern principles of house drains. In former years each house aided to get rid of the smells in the sewers, whereas now each house strove to shut off all communication with the sewers, and thrust its smells under the nose of its neighbour. The drains in the houses, and the sewers in the streets, should all be treated as one system like the veins and arteries of the human body, dependent upon one another, and assisting one another. If the County Council, in its new by-laws, insisted upon intercepting traps in the front of each house, the ventilating pipe ought to be carried up on the sewer side of the interceptor. If there was no interceptor then the ventilator at the end of

he drain would answer all purposes. Another point was that where the intercepting trap was placed on the house side of the drain, flap traps should not be erected. At the present time, he unstopped about twenty drains a week, and the unvarying reports of the sewer men was that it was the syphon trap choked with grease. He wanted, if possible, for the surveyors to have some little voice in the guidance of the affairs of London, and they could only do that by pulling together.

Mr. Norrington, Lambeth, regretted that he was not going to show that unanimity which Mr. Weaver desired. He was very pleased to hear Mr. Lowe say that his Board had adopted the advice given by Mr. Mansergh, and had constructed surface ventilators about sixty yards apart. That was the original recommendation of the Metropolitan Board in 1886. The report of the Metropolitan Board went on to say that the amount of ventilation afforded by large ventilating shafts was in no way commensurate with the cost. Some time ago he made some experiments himself as to the value of these ventilating shafts, and he was sorry to say they confirmed the Metropolitan Board's report. The result of the test of twenty-six surface ventilators was that they all acted more or less vigorously, and that 43 cubic feet of air per minute passed either in or out of the sewers. He examined at the same time, and under the same conditions, twelve ventilating shafts in his district, and he was sorry to say of these shafts only three showed the slightest movement, and the net result was that only 4.25 cubic feet of air per minute passed through them. He could not help feeling that the whole of the money spent on the construction of those shafts—some of them cost as much as 20l.—had been utterly wasted. It was a common practice where they had complaints of surface ventilators to erect these shafts, and, in his opinion, it was nothing but a subterfuge. They did not get rid of the difficulty; they did not ventilate the sewers; but they appeased public clamour, which he did not think worthy of them as officers of Public Authorities. In his opinion, the method of open surface ventilators adopted by the Hampstead Board was the proper method to revert to. It was recommended as long ago as 1886, but had never been fairly tried because the surface ventilators were usually 200 or 300 yards apart.

Mr. Read, Gloucester, said the whole difficulty appeared to him to have been created by the Local Government Board, who said that the drains must be independently ventilated from the sewers. In order to do that, the model by-laws provided for the intercepting trap, which to his mind was the cause of all their difficulties. The intercepting trap paralysed the ventilation of the drains.

Mr. Dodd, Wandsworth, considered that all ventilating pipes erected should be galvanised or glazed inside, or else they would find, as he had, that they were completely stopped by iron rust.

Mr. W. N. Blair, St. Pancras, gave the results of tests of ventilating shafts at Boodle and in the St. Pancras district, which had given excellent results in contradistinction to the unsatisfactory tests of Mr. Norrington. In the St. Pancras case there was no nuisance where formerly there was a terrific nuisance. He was very much in favour of Mr. Weaver's suggestion, but he thought there was very little opportunity of getting owners of property to put a ventilating pipe below the interceptor. The introduction of the syphon trap had undoubtedly interfered with the ventilation of the main sewer. The syphon trap was introduced because drains were not to be relied upon as being either air or water tight, but now they could rest assured that drains were both air and water tight there could be no harm in letting the air pass through that pipe. At the same time he thought many of them would hesitate to have a drain passing under their house which ventilated a public sewer. Where it was in the garden no one would hesitate.

Mr. Weaver, Kensington, said that, to test the feeling of the meeting, he would propose the following resolution, "That in connexion with any interceptor hereafter fixed on a main house drain, it shall be compulsory on the owner of the premises to carry up a ventilating pipe not less than 24 square inches in sectional area from the sewer side of the interceptor up the front side or back of the house, to the satisfaction of the Local Sanitary Authority."

Mr. Blair, St. Pancras, seconded the proposition.

Mr. Norrington, Lambeth, said that Mr. Weaver's proposition only dealt with the fringe of the subject, and he would propose "that the London County Council be recommended to carry out the suggestion of the Metropolitan Board of Works that surface ventilators be placed at a distance of from 50 to 60 yards apart, with air openings in the gratings equal to 60 square inches."

Mr. Southam, Clapham, seconded the proposition.

Mr. Weaver remarked that Mr. Norrington's proposal would have to be taken as an amendment, because if they went in for pipe ventilators they must reduce the number of street surface ventilators.

Mr. Norrington said he declined to put it as an amendment. The first thing to do was to ventilate the sewers; then they might add to it Mr. Weaver's proposal.

Eventually it was decided to put both as separate propositions, and they were adopted. The meeting then terminated.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE thirty-first annual general meeting of the donors and subscribers of this Institution was held at the offices of the Institution, 21, New Bridge-street, E.C., on Tuesday evening, the President-elect, Mr. R. C. Foster (Messrs. Foster & Dicksee), occupying the chair, supported by Mr. Thomas Hall (retiring President) and others.

The Secretary read the report, which stated that the amounts received in the past year were 271l. 8s. 6d. in annual subscriptions, 306l. 0s. 6d. in donations, 148l. 10s. in dividends, and a small sum of 2l. 2s. 11d. was received as interest on deposit. There was also a balance from dinner account of 8l. 10s. 5d., making a total of income for the year of 826l. 18s. 4d. On the expenditure side, the disbursements amounted to 506l. 12s. 6d., of which sum 418l. 8s. 4d. was given in pensions and temporary relief. There are twenty pensioners now on the books. In reference to the orphan fund, there is a vacancy at the present time, and the committee are prepared to receive applications on behalf of intending candidates. The nineteenth annual dinner was held in the King's Hall, Holborn Restaurant, on Tuesday, April 6, 1897. Mr. Thomas Hall, the President, occupying the chair, when 301l. 16s. 6d. was obtained as the result of his appeal. It being known that much distress existed amongst some of the pensioners, it was thought that a good way of celebrating the Queen's Diamond Jubilee would be to increase the amounts of the pensions, the men's being raised from 25l. to 30l. per annum, and the widows' from 20l. to 24l. per annum, the limit of income (apart from pension) being extended from 25l. to 35l. per annum. With reference to the Presidency, the committee announced that Mr. R. C. Foster had accepted the office in succession to Mr. Hall. The committee concluded by thanking the professions and trades connected with the building interests for their continued help.

The President-elect said the Institution was to be congratulated on the success that had attended its operations since its establishment. The previous year's income had been the largest yet received. Then, looking at the income and the expenses incurred, he noticed that of every twenty shillings received, the expenses amounted to 2s. 2d. only. He felt it was certainly a departure to ask a representative of a country firm to become President of a London Institution—but he did not know that this would matter. He concluded by moving a resolution to the effect that the report and balance-sheets be adopted and printed together with list of subscribers and rules. Mr. E. B. Gammon seconded, and the resolution was carried.

Mr. Brooks then proposed, and Mr. Parker seconded, a vote of thanks to the retiring officers, which was carried. Mr. Thomas Hall, the retiring President, replying briefly. On the motion of Mr. Oldham, seconded by Mr. C. K. Turpin, officers for the present year were elected; and the meeting closed with a vote of thanks to the Chairman.

BLOOMSBURY CHAPEL.—It is stated that the fiftieth anniversary of the opening of the chapel will be celebrated this year by placing the fabric in thorough repair and rearranging the interior. It was built by Sir Morton Peto for the Baptists, in 1847-8, after the designs of John Gibson.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the Building Act Committee brought up the following lists of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

St. George, Hanover-square.—A bay window, at the first-floor level, in front of No. 45, Farm-street (Mr. R. B. Marsh for Mr. J. Innes).—Consent.

Dulwich.—An inclosed porch in front of a proposed chapel on the east side of Crystal Palace-road (Mr. T. R. Wonnacott for the trustees of the Primitive Methodist Chapel and Schools, Dulwich).—Consent.

Wandsworth.—One-story shops upon part of the forecourts of Nos. 151, 153, 155, 157, 159, 161, 163, 165, 167, and 169, Balham-high-road (Mr. W. C. Jones for the freeholder and lessees of the property).—Consent.

Fulham.—Projecting pilasters and a pediment over the front entrance to the Red Lion Hotel, No. 492, Fulham-road, Waltham Green (Messrs. Doulton & Co. for Mr. H. J. Squires).—Consent.

Hackney, Central.—A one-story shop in front of No. 38, Morning-lane (Mr. J. Hamilton for Mr. E. Stevens).—Consent.

Hampstead.—A church, with a one-story hall at the rear, on the east side of Finchley-road, at the corner of Frognaal-lane (Mr. W. Wallace for Messrs. G. B. Bruce and W. R. Galbraith).—Consent.

Lewisham.—A wood and glass enclosed porch in front of Parkfield, Bromley-road, Grove Park, Lee (Mr. J. D. Kemp).—Consent.

Lewisham.—Five houses with one-story shops, on the west side of Hither Green-lane, next a house known as "The Laurels" (Mr. J. Stanford).—Consent.

Marlybone, East.—A five-story bay window in front of Nos. 28 and 29, Little Marlybone-street, (Mr. T. H. Smith).—Consent.

Paddington, South.—One-story shops on the forecourts of Nos. 19, 21, 23, and 25, Hatherley-grove, Westbourne-grove (Mr. J. W. Chapman for Mr. W. Owen).—Consent.

St. George, Hanover-square.—Pilasters and a projecting hood to the garden entrance at the rear of No. 38, Berkeley-square, to abut upon Farm-street (Mr. J. Aspell for Earl of Rosebery).—Consent.

St. George, Hanover-square.—A glass and iron porch in front of No. 8, Hanover-square (Mr. D. A. World for Messrs. Ridout and Levett).—Consent.

Dulwich.—Four one-story shops on the south side of Half Moon-lane, near the Half Moon Hotel (Mr. P. C. Davies for Mr. G. W. Riley).—Refused.

Islington, West.—The rebuilding of the Caledonian Arms public house, Caledonian-road, at the corner of Blundell-street (Messrs. Treacher, Son, & Fisher for Mr. J. F. Fitch).—Refused.

Lambeth, North.—Two two-story bay windows in front of proposed new offices at No. 47, Belvedere-road, Westminster-bridge-road (Mr. E. T. Hall for Messrs. Eastwood & Co.).—Refused.

Westminster.—A glass and iron covered way in front of the main entrance to the Hotel Windsor Victoria-street (Mr. C. S. Peach for Messrs. J. R. Cleave & Co.).—Refused.

Westminster.—A glass and iron shelter in front of No. 152, Victoria-street (Mr. G. Odene).—Refused.

Width of Way.

St. George-in-the-East.—Buildings on the site of Nos. 59 and 60, Upper East Smithfield, and Nos. 10 to 12 (inclusive), Chambers-square, to abut also upon Upper East Smithfield (Messrs. G. R. Tasker & Sons for Mr. J. Gluckstein).—Consent.

Hackney, South.—A boundary wall on land adjoining Great Eastern Railway, on the east side of Warburton-street (Mr. S. A. Egan for the Gas Light and Coke Company).—Refused.

Peckham.—That no action be taken with reference to the erection of a building on the north side of Whorlton-road, Peckham Rye, at less than the prescribed distance from the centre of a footpath leading to the Avenue.—Agreed.

Space at Rear.

Southmark, West.—That the Council do, in the exercise of its powers under Section 41 (1) (vi) of the London Building Act, 1894, allow a modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed rebuilding of the Peacock public-house at No. 24, Holland-street, Blackfriars, at the corner of Rider's place, with an irregular space at the rear (Messrs. Gardiner & Theobald for Meux's Breweries Company).—Agreed.

Line of Fronts and Width of Way.

Haggerston.—Workshops, 30 ft. high on the site of Nos. 27, 28, 29, 30, 31, and 32, Cottons-garden, Hackney-road, Shoreditch (Mr. J. Weibeking & Messrs. J. Weibeking & Sons).—Consent.

Lambeth, North.—Rebuilding of the York

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

beer-house, No. 52, Kennington-road (Mr. W. Bradford).—Refused.

Line of Fronts and Space at Rear.

Chelsea.—That consent be not given to a modification of so much of the provisions of Part V. of the London Building Act, 1894, with respect to open space to be provided at the rear of the buildings, and also with regard to an extension above the diagonal line as directed to be drawn by Section 41 of that Act, so far as relates to the erection of two blocks of seven-story residential flats on the north-east side of Franklin's-row, between the grounds of the Duke of York's school and Turk's-row, and that consent be not given (under Sections 22 and 73 of the Act) to the erection of inclosed porches, bay windows, and angle turrets to the said blocks of flats (Mr. P. Hoffman for Mr. H. Bailey).—Agreed.

Line of Fronts and Construction for Buildings.
Islington.—North—A temporary wood and iron shed erected at the side of No. 36, Aubert-park, Highbury (Mr. J. Holloway for the owners of the Home for Confirmed Invalids).—Refused.

Artisans' Dwellings.

Dulwich.—That the Council do, in the exercise of its powers under Section 42 of the London Building Act, 1894, approve and sanction the plans, delivered by Messrs. Hull & Tyler, of a dwelling-house to be inhabited by persons of the working class, erected on part of a garden at the rear of Nos. 92 to 112, Dunstan's-road, East Dulwich, with an entrance from that road.—Agreed.

Buildings on Cleared Area.

Chelsea.—That the Council, in the exercise of its powers under Section 44 of the London Building Act, 1894, do disapprove of the plans and drawings submitted with the further application of Messrs. Bouchier & Galsworthy on behalf of Messrs. Holt & Sons, for a modification or relaxation of so much of the provisions of Part V. of the Act as relates to a block of residential flats, seven stories high, proposed to be erected on the east side of D'Oyley-street on the site of Nos. 12 and 13, and of part of Nos. 11 and 14.—Agreed.

Means of Escape at Top of High Buildings.

Marlybone, West.—That the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, do grant a certificate in respect of the means of escape, in case of fire, proposed to be provided for the persons dwelling or employed on the fifth floor of Bickenhall Mansions, at the corner of Gloucester-place, Marlybone-road (Mr. W. H. Scrymgeour).—Agreed.

The recommendation agreed to is contrary to the views of the Local Authority.

THE LONDON BUILDING ACT, 1894:

IMPORTANT TRIBUNAL OF APPEAL CASES.

THE Tribunal of Appeal under the London Building Act, 1894, sat in the Arbitration-room of the Surveyors' Institution, on Friday, to hear an appeal made by the London School Board against the Notice of Requirement, under Section 78, by Mr. Ellis Marsland, District Surveyor of Camberwell, and served on Mr. Charles Cox, builder, in the matter of a proposed public building, known as public elementary schools, and situate at Leo-street, Old Kent-road. The members of the tribunal sitting were Messrs Arthur Cates, A. A. Hudson, and Penfold. Mr. H. F. Gibson, from the Solicitors' Department of the London School Board, appeared for the appellants, and Mr. Seager Berry, from the Building Act Department of the London County Council, for the respondent.

Mr. Gibson explained that the District Surveyor, by his notice, had attempted to bring under Section 78 of the Act the teachers' offices and retiring room; in other words, he wanted to classify these apartments as habitable and subject to the statutory requirement to be 8 ft. 6 in. in height. The rooms in question were built on half-floors in every school, and were used partly as an office and cloak-room and partly as a retiring and interviewing room by the teachers. No one slept in them. As a matter of fact, they were only actually used as a cupboard of books each day. He understood from the District Surveyor's letters that his objection was based upon the fact that these rooms in the Leo-street school, which was now being built, would only be 7 ft. 6 in. in height, whereas they should, as habitable rooms, be 8 ft. 6 in. as a minimum.

Mr. Seager Berry, interposing, said he took his objection on a general ground.

Mr. Gibson said he was unaware of any other grounds; and, as a fact, was only prepared to meet the objection that the rooms were habitable. To bring them within the definition of habitable rooms, they must, he contended, be used as living rooms. The teachers left the school between 4 and 5 o'clock daily, and the rooms in question were only required by them during the intervals in teaching. It was true small kitchenettes were erected in them, and the most that could be said of them was that they were occasionally used by teachers to cook a chop.

Beyond that the rooms were only used as a teachers' cloak-room, and occasionally as an office for the preparation of returns and so on.

Mr. T. J. Bailey, Architect to the London School Board, gave evidence in support of the appeal. He said these rooms had been provided in every school, of which there were some 800 in London, and were merely used by the teachers as a retiring and cloak room. They were not sanctioned by the Education Department for any other purpose, and were most inexpensively furnished. All that was provided in the way of furniture was a lavatory basin, a table, two chairs, and a set of hat-pegs. No carpet or floor covering of any sort was provided. These rooms in the existing schools varied in height from 7 ft. to 8 ft., and that at Leo-street would, according to the plans, be 7 ft. 6 in. In reply to Mr. Seager Berry, the witness stated that the plans for these rooms were passed by the Education Department, which authority also laid down strict rules as to the purpose for which the room was appropriated. Asked as to what would be the position of the School Board were they forced by a competent authority to increase the height of the rooms, Mr. Bailey replied that it would mean simply this, that more money would have to come out of the rates to enable the building to be raised to such a height as would admit of these rooms being 8 ft. 6 in. There were six windows to the rooms, so the ventilation was ample.

Mr. Seager Berry, for the respondent, said the case opened up a very important question. Their case did not rest wholly upon the point as to whether the rooms were habitable, nor was he bound to confine himself to that objection. A decision under Section 30 of the Act of 1855, which corresponded with Section 78 of the Act of 1894 (Queen v. Carruthers, 33 L. J. p. 107—Magistrates' Cases), entitled him to ask the Tribunal to take cognisance of the general use to which the rooms were put. It was noteworthy that the Act of 1894 increased the statutory minimum height to 8 ft. 6 in., so it would be seen that the tendency of the Legislature was to increase the height of habitable rooms. But though these rooms might not be habitable in the strict sense suggested by Mr. Gibson, they certainly had the characteristics of a habitable room. A cooking range was a strong element in saying that it partook of the nature of a living-room. They might have all the staff of teachers cooking a chop at the same time, which would certainly render the 7 ft. 6 in. room in which it took place very disagreeable. The least the Tribunal could do would be to exercise its control by laying down that the room should not be used for purposes beyond retiring and interviews.

Mr. Bailey, in reply to the Chairman, said that after the school had been constructed the purposes for which these rooms were appropriated were not allowed to be altered.

Mr. Ellis Marsland, the respondent, said he was a school manager for some years, and his experience was that these rooms were used by committees of managers for their meetings. He had raised the point in this instance as a test case.

Mr. Walter C. Williams, chairman of the managers of the Westmorland-road (Walworth) group of schools, stated that he had known these rooms to be used for evening classes as well as for committee meetings of managers. He had heard complaints from teachers that they were in winter very "stuffy," and in summer uncomfortably hot.

Mr. Gibson reminded the Tribunal that the schools were under the strict supervision of the Inspectors of the Education Department.

After consultation with his colleagues, the Chairman said the Tribunal coincided with Mr. Berry's submission that their control extended beyond the mere question as to whether the rooms were habitable. They had, in fact, a wide discretion, but they realised that they were dealing with buildings directly controlled by a public body under a Government Department. They had taken into consideration the general use to which these rooms were put, and on the understanding that the uses to which these rooms were put should be controlled, they allowed the appeal. There would be no order as to costs.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—IX.

WE closed our last chapter with an explanation of the coefficient of resistance, or the ultimate possible strength of each individual fibre of the material. This is not exactly the strength which the material exerts in resistance to either tension or compression, as each fibre in the cross section of a beam has to resist more or less of either or both of these stresses.

The coefficient of resistance for any particular material may be found experimentally, it being 18 times the centre breaking load of a beam of a given material 1 in. square and 1 ft. span, supported at both ends.

The following are the coefficients of resistance

for some of the most frequently used materials:—

Wrought Iron,	20	tons per square inch.
Cast Iron	16	" "
Steel	30	" "
Fir	3½	" "
Oak	4½	" "

We have pointed out that it is only the fibres which are furthest from the neutral axis that are able to exert their ultimate or greatest strength in resisting the rupture of the beam, and that the resistance of any other fibres depends upon their distance from the neutral axis.

This we may express thus:—

$$f = \frac{C}{t} P'$$

Where f is the actual resistance afforded by any given fibre in tons per square inch, C , the coefficient of resistance, P' , the distance from the neutral axis to the given fibre, and t , the distance from the neutral axis to the furthest fibre. The actual resistance of any given fibre in tons will, of course, be its resistance in tons per square inch, multiplied by its area in square inches, or

$$F = fa$$

Substituting the value of f from our former expression, we have

$$F = \frac{C}{t} P' a$$

The moment which is the measure of the resistance that any given fibre opposes to the rupture of the beam is plainly its actual resistance, multiplied by its perpendicular distance from the neutral axis, or

$$r = Ff$$

Substituting the value of F , which we have found, we get

$$r = \frac{C}{t} P' a \quad P' = \frac{C}{t} t'a$$

The moment of resistance of the entire cross section of the beam is, therefore, the sum of the moments of resistances of the individual fibres. This sum of the moments of resistances of the individual fibres is the moment of inertia to which we have already referred in Chapter VII. We therefore have as our expression for the moments of resistance of the entire cross section of the beam

$$R = \frac{C}{t} I$$

Where R is the moment of resistance, C the coefficient of resistance, t the distance from the neutral axis to the furthest fibre, and I the moment of inertia, which, as we have already explained, is dependent upon the shape of the section, and not the material of the beam, and the value of which, for the most usual forms of section, we have given in Chapter VII.

For beams of square or rectangular cross section the expression given above becomes

$$R = \frac{c}{6} a d^3$$

Where R is the moment of resistance, c the coefficient of resistance, a the area of cross section in square inches, d the depth in inches.

In rolled iron or steel beams the moment of resistance may be approximately found thus:—

$$R = (a + \frac{1}{2} a') \times d \times E$$

Where R is the moment of resistance a' the area of cross section of one flange, a the area of cross section of web, d the depth of beam, E the elastic limit of iron or steel in pounds per square inch. All the dimensions are to be taken in inches. The area of the web is its thickness multiplied by the extreme depth of the beam, and the area of one flange is half the difference between the area of the whole beam and the area of the web. For average rolled iron the elastic limit may be taken at 10 tons per square inch, and for steel at 16 tons per square inch.

We have already pointed out how the value of the moment of inertia for irregular-shaped beams may be found by finding the moments of inertia for any number of rectangles into which the section may be divided. If it is not possible to divide the section into rectangles as may occur in the case of beams with an irregular curved section, an approximation sufficiently near the real moment of inertia, may be obtained by dividing an irregular cross section into parallel strips which approximate to rectangular form.

Care must be taken that these separate moments of inertia are all referred to the neutral axis of the whole section, and the position of this neutral axis in any section, however irregular, may be ascertained by

cutting out a figure in card, or a thin sheet of metal, and balancing it over a straight edge. The horizontal line on which the model of the section balances is the horizontal neutral axis of that particular section. The student is now in a position to calculate the moment of rupture for any arrangement of loads, and the necessary cross section of a beam of any of the materials for which we have given the coefficient of resistance to properly resist the reaction resulting from the loads in each particular case. We, therefore, cannot do better than illustrate this by some examples. Let us suppose a beam 20 ft. span has a load of five tons upon it 4 ft. from one end, and a load of six tons 5 ft. from the other end, we will then proceed to find the reaction of each support, that is, the portion of the load which comes upon each. Calling R_1 the reaction of the support close to the load of five tons, and R_2 the reaction of that close to the six tons, we should have

$$R_1 = \frac{5 \times 16}{20} + \frac{6 \times 5}{20} = 4 + 1\frac{1}{2} = 5\frac{1}{2} \text{ tons.}$$

$$R_2 = \frac{5 \times 4}{20} + \frac{6 \times 15}{20} = 1 + 4\frac{1}{2} = 5\frac{1}{2} \text{ tons.}$$

Now let us take another example. A beam 24 ft. span has a load of four tons evenly distributed over a length of 6 ft. from one support, and a load of six tons evenly distributed over a length of 8 ft. from the other support, with a concentrated load of three tons midway between the distributed loads. Again calling R_1 the reaction of the support next to the four-ton load, and R_2 that of the support next to the six-ton load we should have

$$R_1 = \frac{4 \times 21}{24} + \frac{3 \times 13}{24} + \frac{6 \times 4}{24} \\ = 3\frac{1}{2} + 1\frac{1}{2} + 1 \\ = 6\frac{1}{2} \text{ tons.}$$

$$R_2 = \frac{4 \times 3}{24} + \frac{3 \times 11}{24} + \frac{6 \times 20}{24} \\ = \frac{1}{2} + 1\frac{1}{2} + 5 \\ = 6\frac{1}{2} \text{ tons.}$$

These two examples will be sufficient to show how in every case the reactions of the supports are to be found. We then wish to find the cross section of the beam which would be necessary to properly resist the stresses represented by these reactions. In either case the point at which the greatest stress comes upon the beam is at the centre of gravity of the combined loads. We note that in the latter case the reactions of the supports are unequal, and, therefore, the centre of gravity is not at the middle of the span. We can find the position of this centre of gravity in two ways, either by working out the position from the centres of gravities of the various loads, or, what is simpler and better, from the reactions of the two supports.

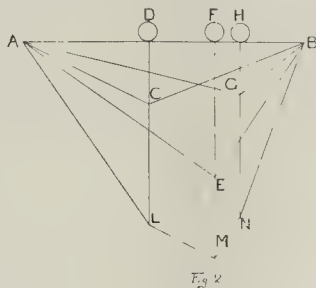
The centre of gravity will be so situated that its distance from either support will be in the inverse ratio of the resistances or loads on the supports, and may be found by multiplying the whole span by one of the resistances, and dividing by their sum.

Thus the distance of centre of gravity from R_1 is

$$\frac{24 \times 6\frac{1}{2}}{13} = \frac{165}{13} = 12\frac{9}{13} \text{ foot.}$$

In the practical calculation of girders with unevenly distributed loads it is very useful and most expeditious to adopt a graphical method of representing reactions of the supports and the moment of rupture caused by these. Taking first of all examples in which a single load is applied to a beam, the maximum bending moment is of course at the point of application of the load, and finding the amount of

we please. Then joining the end of this line to each point of support, we have a triangle, ADB, representing graphically the bending moment at different points in the beam. And the value of this bending moment at any point in the beam may be obtained by measuring the vertical height from the base of the triangle to one of the sides, as at EF or GH, on the same scale as we originally drew our maximum bending moment CD. With a number of loads we may draw a similar triangle for the bending moment due to each particular load as in fig. 2, the triangles ACB, AEB, AGB, and the



value of the bending moment at any particular point will be found by adding together the vertical distances from that point to the sides of the three triangles. Drawing such lines from points D, F, H, and setting out their values at L, M, N, we may join up the polygon A L M N B, which will represent the bending moment throughout the beam. The case of a distributed load is not perhaps quite so simple. If the load is distributed evenly over the whole span of the beam, the greatest bending moment is of course once again at the middle of the beam. And if we divide the whole of the load into any number of equal portions and find the value of the bending moment for each, and then represent them graphically on the same scale, we shall then find that the line bounding the ends of the lines representing these bending moments will be a parabolic curve. Or if we draw the line representing our greatest bending moment on such a scale that this is less than one-eighth of the span, a circular arc passing through this point and the extremities of the spans is sufficiently near for practical purposes. If the distributed load extends over a part only of the span, the parabolic curve extends only to the part of the span over which the load is distributed, and from these points we should have a straight line joining the extremities of the span. What we have said with regard to beams applies also to cantilevers, these being considered as beams fixed at one end; and the load on a cantilever may therefore be graphically represented in a similar manner to that which we have explained for beams.

BOOKS RECEIVED.

HANDBOOK ON THE WORKMEN'S COMPENSATION ACT. By M. Roberts-Jones (Cardiff: Western Mail Office).

THE BASES OF DESIGN: By Walter Crane. (London: Geo. Bell & Sons; 1898).

LAW AND PRACTICE OF COMPENSATION: By H. C. Richards and J. P. H. Soper. (Sweet & Maxwell.)

OBITUARY.

MR. D. TAYLOR.—The death of Mr. David Taylor, contractor, took place at Infield, Methven, Perth, recently. The deceased was born in 1812. About 1858 he started contracting, being the chief partner in the firm of David Taylor & Sons, now the firm of D. & R. Taylor. At that time deceased devoted his efforts more especially to agricultural drainage. About twenty-five years ago he carried out the sewer work of Bridgend, and afterwards Barnhill, while at various times he has been entrusted with contracts in connexion with sewers in Perth. The extension of the railway at the Glasgow road some thirty years ago was carried out under his management.

PROPOSED NEW INFIRMARY, ALCESTER, WARWICKSHIRE.—Mr. W. H. Ward has prepared sketch plans for a proposed new infirmary at Alcester. The estimated cost of the new buildings is £820l., and it has been decided to apply to the Local Government Board for a loan of 7,000l.

GENERAL BUILDING NEWS.

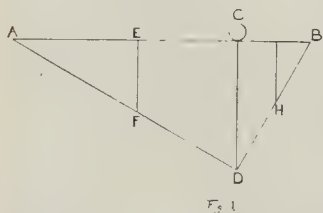
HOLY TRINITY CHURCH, ROEHAMPTON.—A church of considerable size at Roehampton, dedicated to Holy Trinity, was on Saturday opened by the Bishop of Rochester. The late Duchess of Teck laid the foundation stone in April, 1896. It stands on rising ground and is a prominent object from Roehampton and the Common. Its chief external feature is a spire about 200 ft. high, still enveloped in scaffolding, but nearly complete. The chief entrance to the church is under this tower, placed at the north-west angle of the nave, and a second entrance has been placed on the east side of the north transept to give access to the chancel, vestries, and side chapel. Opposite the tower and spire, at the south-west angle, is the baptistry, with a semi-circular apse. The body of the church consists of a nave of five bays, and chancel of equal width; the nave has side aisles, and on the north is a transept which also serves as a nave for the small side chapel on the north side of the choir. On the south side of the choir are vestries, an organ chamber over, and heating chamber below. The style adopted for the architecture is that of the latter part of the thirteenth century. Early English, with some Decorated detail in the window tracery. There are large windows at the east and west ends, and two in the north transept. The rest of the church, nave, clearstory, baptistry, and side chapels, has lancets. The east window has been filled with stained glass by Messrs. E. Kemp, and the lancets in the baptistry and side chapel by Messrs. Bacon Bros. The chief feature of the interior, however, is the lofty stone open screen, carried the full height of the church, which forms the division between nave and chancel. The dwarf wall on which it rests has figures in niches against a gold mosaic background. Although Kentish rag has been used for the walls, with corbels of the same material, the stone for the exterior, the interior has had the somewhat cold effect of the Corsham stone considerably relieved by a free use of red brick, and the woodwork of the roofs of nave and chancel, of deal and of the "waggon" type, have been stained green with very pleasant results. Besides the stained glass, however, already mentioned, there is already a great deal of decorative work in the church—an alabaster reredos with sculptured panels of the Last Supper, and the Crucifixion elaborately coloured; copper and brass altar rails; a cross and other metal work on the screen; and rich dossal hangings to the altar in the side chapel. Panels have also been introduced over the nave arcades, and at the west and east ends, which will in time be filled with mosaic or treated in fresco. The interior will then have a very rich effect. Electric light has been introduced, and the church is heated on the low-pressure system. The architect is Mr. Geo. H. Fellowes-Prynn. Mr. G. Jones was the clerk of works. The contractor was Mr. A. Porter, of Tottenham. The carving of the reredos, altar, pulpit, stalls, screen, and font, was carried out by Messrs. H. H. Martyn & Co., of Cheltenham; the altar rails and chancel gates by Messrs. Singer, of Frome. The altar panels were painted by Mr. E. A. Fellowes-Prynn. The reredos was coloured by Messrs. Fourcres, of Plymouth, under the supervision of the same artist. The seating was carried out by Messrs. Lonnie & Co., of Kennington, and the electric lighting by Messrs. Laing, Wharton, Down, & Co. The heating work was carried out by Messrs. Dargue, Griffiths & Co., of Liverpool.

PROPOSED CHURCH, NEWPORT.—A new parish of St. John the Baptist is being formed at Newport, Monmouthshire, which church is to be built to accommodate 700 persons. The architect is Mr. F. R. Kempson, of Hereford and Cardiff.

PARISH CHURCH, MOLDGREEN, HUDDERSFIELD.—On the 15th inst. a bazaar was opened in Huddersfield Town Hall to raise funds for the completion of Christ Church, Moldgreen. The church has no chancel and no vestries. Plans have been prepared by Mr. G. F. Bodley, which provide for an extension of the nave and the erection of the chancel and vestries.

CHURCH EXTENSION, SMALL HEATH.—It is proposed to enlarge St. Aidan's Church, Herbert-road, Small Heath. The extension will consist of carrying the nave and aisles westward for another three bays, and this work will be carried out in accordance with the designs of Mr. T. F. Proud, who was the architect of the church. At present the building affords sitting accommodation for 400 worshippers, but when the extension has been effected there will be sittings for 900 persons.

ADDITIONS TO MOSELEY PARISH CHURCH, NEAR BIRMINGHAM.—Moseley Parish Church has just been reopened after enlargement. The alterations have been carried out from the designs of Mr. J. A. Chatwin. A few years ago a north aisle was erected, and a small apsidal chancel was added. This was found to be a mistake, and it was to rectify it that the plan suggested by the architect was adopted, which provides a large chancel, a chancel aisle, and also a south transept, which will provide for about 100 additional sittings. The plan was prepared with the view of extending the improvements hereafter by dividing the present body of the church into a nave and south aisle. The chancel and transepts externally are faced with Bromsgrove stone. The floors under the seats are laid with wood blocks, while the portion of the chancel within the



this from the reactions, we can set it up graphically as shown in fig. 1 to any scale

altar rails is paved with glass mosaic. The roofs are covered with green Westmoreland slate. Messrs. Collins & Godfrey, of Tewkesbury, were the contractors. The outlay has been between 2,000l. and 3,000l.—*Birmingham Post.*

CHESTERFIELD PARISH CHURCH.—The Duchess of Portland visited Chesterfield on the 15th inst., and opened a bazaar in aid of the Parish Church Restoration Fund. Mr. Temple Moore, who was called in to make an examination of the church and steeple two and a half years ago, having reported that the sum of 15,000l. would be required to restore the entire structure, it was decided to proceed with the work in sections. The Foljambe Chapel, at the south-eastern corner of the church, has been restored, the walls having been either rebuilt throughout, or refaced, and the old roof replaced. A recent survey has convinced the architect, it is stated, that operations must be commenced without delay upon the spire. In his report to the Restoration Committee Mr. Moore writes: "It is impossible to place any reliance on many of the timbers, and it is imperative that the work of overhauling and restoring the spire should be undertaken at once, or it should be taken down in saying 'at once' I do not mean several months hence. The work is a very important one, and will take some months to carry out." The money raised at the bazaar will be spent in securing the safety of the spire.

CHURCH, CARLISLE.—Steps are being taken at Carlisle towards the erection of a new church, parish-rooms, and parsonage on the east side of the city. The new church, also, towards the erection of a mission-room on the west side of the city, at Newtown. The new church is to cost 7,000l. Mr. C. J. Ferguson is the architect.

NEW CHURCH, BRAEMAR.—The Church of St. Margaret of Scotland, Braemar, Aberdeenshire, Scotland, is now to be constructed in permanent form. The external walls will be of Braemar stone, with dressings of freestone from Rhynie, Aberdeenshire. The architects are Messrs. W. Bucknall & J. M. Comper, Westminster, London.

CHURCH, EDINBURGH.—The building committee of St. Martin's Episcopal Church, Edinburgh, met in the Representative Council Chambers, Queen's-street, Edinburgh, on the 3rd inst., to consider plans for a new church and church halls, prepared by Mr. Robertson, architect, Inverness. It was decided meantime only to proceed with the nave, aisles, and vestries in connexion with the church, with school halls and class-rooms under the building. Mr. Robertson prepared a set of amended plans, embodying the suggestions of the committee, which were submitted at a meeting of the building committee held in the Representative Council Chambers on the 7th, when they were approved of and accepted.

METHODIST CHURCH, MORLEY, YORKSHIRE.—A new chapel in connexion with the United Methodist Free Church was opened at Morley recently. The chapel has been built from designs prepared by Mr. T. A. Buttery, architect, of Morley, at a cost of 2,500l. The building provides accommodation for 577 adults and is lighted by electricity.

RENOVATION OF ABERUTHVEN FREE CHURCH, PERTSHIRE.—Aberuthven Free Church was reopened recently after restoration. A new system of hot-water heating has been introduced throughout the church on the low-pressure system, and the building has also been refitted. The contractors were—For heating, Messrs. Boyd & Son, Paisley; joinery, Peter McEwan, Aberuthven; painter, Mr. A. Dewar, Dunning; slater, Mr. Duncan. Mr. James Marshall was the architect.

PRESBYTERIAN CHURCH, BANGOR.—A new Presbyterian church is to be erected in Bangor on a site in the Hamilton-road. The general plan of the church is horseshoe in shape. The first block will accommodate about 400 on the ground floor and about 300 in the galleries, and the future block, in the form of a second transept, will give accommodation for about 300, so that the church is designed to accommodate a congregation of 1,000. The architect for the building is Mr. Wm. J. W. Roome, of Belfast.

WESLEYAN CHAPEL, BRIGHTSIDE, SHEFFIELD.—A new Wesleyan chapel, erected in Dearne-street, Brightside Village, was opened on the 17th inst. Mr. W. J. Hale was the architect. There is seating accommodation for 375 persons. A small gallery extends along the end of the building above the entrance. Vestries have been built under the chapel, and the old school-room is to continue in use. The contractors were Messrs. Powell & Son, and the heating apparatus was laid down by Messrs. W. Trueman & Son.

METHODIST CHAPEL, BARROW-IN-FURNESS.—The memorial stone has just been laid of new chapels and schools at Barrow-in-Furness. The premises will cost about 6,500l. when completed. The plans include a chapel to seat 784, chiefly on the ground floor, a school for 500, and an infants' room to accommodate 100. There will be seven class-rooms, two vestries, and a church parlour. The contracts are being carried out by local tradesmen under the superintendence of Messrs. Waddington & Sons, of Burnley and Manchester, the architects.

SCHOOLS, MOUNT PLEASANT, SOUTHAMPTON.—The new Mount Pleasant Schools have just been opened by Sir George Kekewich. The architect was Mr. J. H. Blizard, Architect to the Southampton

School Board, and the work has been carried out by Messrs. H. Stevens & Co., of Southampton.

ST. EDMUND'S SCHOOL, CANTERBURY.—The new junior school, recently added at St. Edmund's School, St. Thomas's Hill, Canterbury, was opened on the 10th inst. The building has been erected from the designs of the architect, Sir Arthur Blomfield, A.R.A., the contractor being Mr. W. J. Adcock, of Dover and Canterbury. The building consists of class-rooms, dining-room, infirmaries, matron's and master's-rooms, &c., and a dormitory upon the second floor.

WAREHOUSE, GOLDEN-LANE, CITY.—A new warehouse for Mr. S. H. Weiler has been erected in Golden-lane. The premises front upon Golden-lane, Cripplegate-street, Charles-street, Brackley-street, and Bridgewater-street, and stand upon an area of about half an acre. The new buildings consist of basement and five floors over, with flat asphalted roofs. On the top floor are kitchens for the use of the 300 employes. The flat roof has been railed in to serve as a promenade. The electric light has been installed, and two fireproof staircases lead directly into the main street. The Hydraulic Company's mains are also connected with the building. Mr. George Vickery is the architect, and Messrs. Lawrence & Sons the builders.

PUBLIC WASHHOUSES, GLASGOW.—A public washhouse is to be erected at Glasgow on ground acquired at the west corner of Bain-square and Gallowgate. The site will be occupied by three tenements of dwelling-houses and shops with frontages to Gallowgate and Bain-square. The washhouse will be situated at the rear of the tenements, the roof of the erection forming a back court, to which access is gained from the first landing. The washing stalls number forty-four. With regard to the tenements surrounding the washhouse, these are estimated to cost 7,200l. The building will be four stories high, and will contain twenty-four dwelling-houses of two apartments and three houses of single apartments. The plans were prepared by Mr. A. B. McDonald, City Architect.

PROPOSED OPERA HOUSE, BARNSELY.—At a meeting of the Barnsley Town Council on the 9th inst., the plans of the proposed new opera house to be erected in Eldon-street were approved and passed. The plans have been prepared by Mr. John P. Briggs, of London. The site allows of three sides open to the roadway. Seating accommodation has been provided for 1,400. The theatre will be fireproof throughout, and the entire house will be provided with electric light. The whole of the auditorium, entrances, saloons, and dressing-rooms will be heated by hot-water.

CO-OPERATIVE BOOT AND SHOE MANUFACTORY, RAUNDS, NORTHAMPTON.—An Athy boot and shoe factory was opened on the 12th inst. at Raunds by the Crispin Co-operative Society. The building, which is of three stories, has been erected on a plot of land on the Cornbrash Estate, to the south of Hill-street. The architect was Mr. T. R. Lovell, and the contractor Mr. W. H. Lovell, of Raunds.

NAVAL BARRACKS, KEYHAM, PLYMOUTH.—The Admiralty have long contemplated an extension of the existing accommodation at the Seamen's Barracks at Keyham. They have now resolved on a scheme, and the contract, which will eventually involve the expenditure of upwards of £200,000, and will take some three years to carry out, has been secured by Mr. A. R. Debnam, of Plymouth. The new buildings are to afford accommodation for another 1,000 officers and men. The new premises will be erected on land to the S.E. of the existing building, and will include an officers' mess-room and hall, surmounted by a tower 120 ft. high. The whole of the new work will be in architectural keeping with the present buildings. It will come under the supervision of Major H. Pilkington, C.B., R.E., the Civil Engineer-in-Chief of the Navy Loan Works. The work will be begun almost immediately.—*Western Mercury.*

FREE LIBRARY, HUDDERSFIELD.—The first portion—Reading and New Rooms—of the Huddersfield Free Library and Art Gallery was opened on the 14th inst. Under the superintendence of Mr. W. Cooper, architect, the adaptation of the building, for the purposes of a Public Library and Art Gallery, has been carried out. The rooms are situated on the two upper floors of Somerset-buildings, the approach being by a wide staircase from Church-street. The main floor consists of a central hall two stories in height, with glazed ceiling lights over. Around the hall on this floor are placed the lending library, 36 ft. by 32 ft.; reference library, 30 ft. by 18 ft.; news-room, 38 ft. by 19 ft.; magazine-room, 21 ft. by 17 ft.; and ladies' reading-room, 21 ft. by 17 ft. The lending library is designed for "the open access system." A dwarf screen, to which the entrance and exit doors are fixed, divides the lending library from the hall. At the back of this screen, on the lending library side, is fixed the librarian's counter. The book stacks fixed in this department have been supplied by Messrs. W. Lucy & Co., Limited, Oxford, and are of cast-iron. The rooms on the upper floor are entered from an open balcony which extends around the upper part of the central hall, these comprise the Art Gallery, 70 ft. by 18 ft., cloak-room, lavatory, also rooms for librarian, committee, storage and book repairs, &c. The Art Gallery is lighted from the north. Caretaker's rooms are placed on the second floor. The hydraulic lift, which is fixed in the well of the staircase, may

be made use of for service purposes to each floor. The decorations have been carried out under the direction of Mr. G. F. Armitage, of Altrincham. The rooms are lighted by electricity, and heated by hot-water on the low-pressure system. The works have been carried out by the undermentioned firms:—Mason, Messrs. Graham & Jessop; joiners, Messrs. Crowther & Wilkinson; cabinet maker, Mr. Henry Stephenson; and electric light, Messrs. R. Holliday & Sons.

CONSTITUTIONAL CLUB, PORT TALBOT.—The Constitutional Club at Port Talbot was opened recently. The club premises are situated between Port Talbot Station and the Town of Aberavon. On the ground floor are a shop and premises, let to the Metropolitan Bank (of England and Wales) and in the centre of the building is the entrance hall to the club, laid with encaustic tiles. At the rear is a hall capable of seating 300 persons. On the first floor is a billiard-room. On the same floor are a large reading-room and dining-room. On the second floor are committee-rooms and the stewards' rooms. The premises are built with red brick and Bath stone facings. The architect was Mr. J. A. James, Port Talbot, the builder being Mr. John Davies, Aberavon.

MISSION AND PARISH ROOM, CUTNALL GREEN, WORCESTERSHIRE.—A mission and parish room, in connexion with the parish of Elmbridge, was opened recently at Cutnall Green. The architects were Messrs. Sheppard & Sons, of Worcester, and the work was carried out by Messrs. Emus & Harris, of Droitwich.

PUBLIC WASH-HOUSES, DUNDEE.—The public wash-houses in Guthrie-street, the first of a series of such conveniences which the Town Council of Dundee propose to erect in various districts of the city, have just been opened. The building is situated to the north, and adjoining the public baths in Guthrie-street. The entrance is to the west of the door of the baths, access being gained to the wash-houses by means of a sloping corridor. By this arrangement the office is situated between the entrances to the two departments, so that the clerk is able to attend to both at the same time. The wash-house is 57 ft. in length and 45 ft. in breadth, and, like the corridor, is paved with granolithic. The roof is supported on iron couples. Washing is carried on in twenty-four stalls, arranged in four transverse lines, with a drying chamber between each two rows. The stalls are 6 ft. long and 5 ft. broad, and are separated from each other by iron partitions. The other accommodation includes a lavatory, waiting-room, and private room for depositing bundles of clothing. The designs were prepared by Mr. Mackison, the Burgh Engineer. Mr. Allen acted as clerk of works. The cost of the establishment has been 1,700l., and the principal contractors were:—Mason, David Crichton; joiners, Gove & Cameron; slaters, Ramsay & Reid; plumbers, John Crighton & Sons; plaster and granolithic work, Reoch & Kilgour; painters, Petrie & Greig; iron work, John Jack; engineers, Cooper & Greig.

PARISH COUNCIL CHAMBERS, STEVENSON, AYR. New chambers have been erected by the Parish Council in New-street, from plans prepared by Mr. Hugh Thomson, architect, Saltcoats.

SYNAGOGUE, GRAHAM-STREET, EDINBURGH.—The new Jewish Synagogue, Graham-street, Edinburgh, was consecrated a few days ago. The building is an adaptation of the new Greyfriars Free Church, and the architect for the reconstruction was Mr. W. N. Thomson, Leith. The electric light installation is by Messrs. James Gray & Son. Messrs. Dobie & Son carried out the decorative works.

TEMPORARY HOSPITAL BUILDING FOR BROMSGROVE, WORCESTERSHIRE.—A meeting of the Bromsgrove, Droitwich, and Redditch Joint Infectious Hospital Committee was held at the offices of the Clerk recently, when a report was presented from the Building Sub-Committee, in which was stated that the Committee had provisionally engaged Mr. Gadd, architect, of Bromsgrove, to prepare a specification for the wood and iron building referred to in their last report, and to get in tenders for the same, and to superintend such other work as is to be carried out for the Committee.

WEST RIDING COUNTY HALL, WAKEFIELD.—The new County Hall for the West Riding County Council was opened at Wakefield on Tuesday. The new building, which has cost about 120,000l., covers an area of some 45,130 square feet. It is situated in close proximity to the Town Hall and Sessions Courts, and faces towards Bond-street. It has also frontages to Cliffe-parade, Burton-street, and Hardy-street. The architects were Messrs. Gibson & Russell, of London, and the contractors were Messrs. Armitage & Hodgson, Mr. A. E. Marsh being the clerk of the works. The building has been described and illustrated in the following issues of the *Builder*:—April 29, 1893; November 10, 1894; March 9, 1895; June 6, 1896; and December 5, 1896. The floors and ceilings were constructed by Messrs. S. Ferguson & Son, of Carlisle, on their fire-resisting system. Sub-contracts have been carried out by the following:—Heating, Mr. Fredk. Milan, of Huddersfield; lighting, Mr. T. Harding Churton, of Leeds (under the direction of Mr. S. A. Court, consulting electrical engineer, London); and wrought-iron gables and stairs' balusters, Mr. G. W. Singer, of Frome.

MANSION, BENHILL-ON-SEA.—The tender of Mr. A. H. White, of St. Leonards-on-Sea, has been

accepted at 1,292l. for stabling at Sir Edward Mallet's mansion, "Westwood," near Bexhill-on-Sea. Mr. White's contract for the house (at present being built) was 8,481l. Mr. G. H. Gray, of Bexhill-on-Sea, is the architect.

SANITARY AND ENGINEERING NEWS.

PROPOSED NEW SEA WALL, HERNE BAY.—It is proposed to construct a new sea wall at Herne Bay at a cost of about 19,000l. Mr. Baldwin Latham will be the engineer for the work.

LOCAL SEWERS IN LONDON.—The Main Drainage Committee of the London County Council have sanctioned, subject to a condition recommended by the Engineer, the construction of the following local sewers:—Fulham: 596 ft., 1,242 ft., 584 ft., and 586 ft. of 12-in. pipe sewer in Allsestree-road, Bronsart-road, Mablethorpe-road, and Rowallan-pipe sewer in Fulham Park-gardens, Burlington Estate; and 176 ft. of 12-in. pipe sewer in Brough-ton-road, Stephendale-road.

DRAINAGE SCHEME, BATLEY.—Colonel A. J. Hepper, a Local Government Board Inspector, held an inquiry at the Batley Town Hall on the 9th inst. in connexion with the Corporation's application for sanction to borrow a sum of 13,494l. for works of surface water drainage. The Town Clerk (Mr. J. H. Craik) and the Mayor (Alderman J. W. Blackburn), with the Borough Surveyor (Mr. O. J. Kirby), represented the Corporation. Mr. Craik, in opening the proceedings, explained that the Corporation proposed to introduce a proper system of surface drainage in nearly 200 streets and roads in the borough.

SANITARY WORK, &c., ST. ANNES, LANCASHIRE.—Mr. G. Hodgkinson, Sanitary Inspector and Surveyor to the St. Anne's Urban Council, in his annual report, states that during the year the Council have had under consideration seventy-nine plans, embracing two alterations to chapels, 12 new houses, three shops, sixteen workshops, &c., one private school, five street plans, three sewers for streets, one new hotel, one hotel extension, a small hospital to the Ormerod Home, farm building, and alterations to fifteen houses. Private street works have been carried out as follows:—St. Andrew's-road South, Wood-street, Back St. Anne's-road (third portion), Orchard-road, and contracts have been let for St. Anne's-road West, St. Alban's-road (second portion), Nelson-street, and Church-road. The main drainage system has been extended, the following extensions having been made with Hassall's double-lined pipes:—Headroomgate-road, 2,000 ft. 12-in. pipes; by the Fairhaven Estate Company, Fairhaven-road, and the promenade, 1,500 ft. of 18-in. pipes; Derbe-road, Tarsus-place, and Alexandra Drive, 870 ft. of 9-in. pipes; by J. T. Clifton and frontagers, St. Alban's-road and Alexandra-road, 430 ft. of 12-in. pipes; and new streets 970 ft. of 9-in. pipes. The laying-out of the Esplanade in gardens and pleasure grounds, and the erection of ladies' pavilion, children's shelter, band stand, fountain, shelter, seats, with underground conveniences, has been carried out, and the work of extending the Promenade-road to Fairhaven is being pushed on. A new convalescent home has been completed and opened.

SEWERAGE SCHEME, WALSALL WOOD.—The memorial stone of the Sheffield pumping station in connexion with the Walsall Wood sewerage scheme, was laid on the 15th inst. The engineer is Mr. H. B. Nichols, Birmingham. The scheme provides for a district having a population of between 6,000 and 7,000. The cost of the scheme will be about 11,700l. Mr. H. Holloway, Wolverhampton, has the contract.

STAINED GLASS AND DECORATION.

WINDOW, ST. MARY'S CHURCH, LONG DITTON.—A stained glass window, by Messrs. Lavers & Westlake, has been placed in the south transept of St. Mary's Church, Long Ditton, as a memorial of the Queen's Diamond Jubilee. The window comprises four long lights, each with four panels, containing over thirty figures, and a circular light in the apex, with small pieces on either side.

WINDOW, PERSHORE ABBEY CHURCH.—A window of Munich glass has just been inserted in Pershore Abbey, consisting of three large lancets with nine separate scenes illustrating the life of St. Peter. The work has been carried out in accordance with the Early English style of the church, under the supervision of the architect, Mr. W. Lunn, of Great Malvern, by Messrs. Mayer & Co.

WINDOW, ST. PAUL'S FREE CHURCH, DUNDEE.—A stained-glass window has been erected in Free St. Paul's Church, Dundee. The subjects represented in the window are Faith, Hope, and Charity, and the work was entrusted to Messrs. Clayton & Bell, London.

PRAYER DESK, SALISBURY CATHEDRAL.—A richly carved prayer desk has recently been placed in the choir of Salisbury Cathedral, before the altar used by the Bishop for ordinations, &c. The desk is of Italian walnut, has traceried ends surmounted with conventional foliage; and the group in front depicts Moses with his hands staid up by Aaron and Hur (Exod. ch. 17, v. 12). The work was executed by Mr. T. Rudge Salcott, Clapham Common, from the designs of Mr. E. Doran Webb, architect, of Salisbury.

FOREIGN.

FRANCE.—M. Denys Puch, sculptor, has just finished the model of the monument which is to be erected to the memory of Francis Garnier. The expenses are to be defrayed by subscription. The monument consists of a bust of the explorer, in naval uniform, resting on a pedestal the six sides of which are ornamented with oriental architectural ornaments borrowed from the Musée Guimet. Around the pedestal are grouped three figures, the "Sene," being offered the products of Indo-China by "Cambodia," and "Geography" who holds up to Garnier an oak branch. The pedestal is being carried out from designs by M. Vaudremer. The monument is to be cast in bronze, and erected in the Avenue de l'Observatoire, between the statue of Marshal Ney and the Carpeaux fountain. The inauguration will take place on July 4.—The Carnavalet Museum has just been enriched by a fine picture of Debri-court's representing the preparations for the Federation fête in 1790. One other picture is also to be placed there; it is by M. Luigi Loir, and represents the fête at the Hôtel de Ville, in honour of the Czar, 1896.—The administration of the Ville de Paris is now preparing an account of the visit of the Russian Sovereigns. This publication, which is to be handsomely bound, will be illustrated by MM. Paul Maureon, Lefort, Coutry, Ondart, Follon, and Claude Fèvre. M. G. Guvay Larroumet, late Director of the Beaux-Arts, will very probably succeed Count Henri Delaborde as permanent Secretary at the Académie des Beaux-Arts.—The annual exhibition of painting and sculpture of Russians living in Paris has just been opened.—The Administration of the Ville de Paris is contemplating the erection of an equestrian statue of Jean de Jarcy, by M. Paul Dubois, in the empty space in the centre of the Place Saint Augustin.—There is also a scheme to erect somewhere in Paris, though the site is not yet determined upon, an equestrian statue of General Washington. The statue is by a young American sculptor (Mr. H. H. Rous), has been paid for by American subscription.—M. Rous has been elected President (for 1898) of the Society of Architects who have received diplomas from the Government. M. Bonnier has been elected Vice-President.—The Administration of the Département de la Seine has just opened a landscape competition, with or without figures, for the decoration of the Salle des Fêtes in the Mairie at Vincennes. The landscape must be in the neighbourhood of Vincennes.—The death is announced, at the age of 85, of M. Ch. Auguste Alexandre Rabourdin, architect, and President of the Société des Architectes d'Orléans.

A NILE RESERVOIR.—The Egyptian Government has signed a contract with Messrs. John Aird & Co. for the construction of barrages at Assouan and at Assiout, the work to be completed in five years, and payment to be made by instalments extending over thirty years, the first instalment to be payable after completion. A Nile reservoir will be thus constructed, and 10,931,050,000 cubic metres of water will be stored.

GERMANY AND AUSTRIA.—The *Zeitschrift für Architektur und Ingenieurwesen* contains an illustrated account of the magnificent bank recently erected by Messrs. Sommerschuh & Rumpel in Dresden.—The evangelical congregation at Bielitz, Silesia, are about to erect a bronze statue, with granite pedestal, to the memory of Luther, the cost about 8,000 florins.—During the past year 596 new buildings have been erected in Vienna.—A new sanatorium is to be erected in Gmunden from the designs of Herr M. Rosenauer, Municipal Architect.—The building of the law courts in Laybach is to commence this year.—A centre for the supply of electricity for motive purposes is to be erected in Prague at a cost of 2,500,000 florins.—A new parish, with church and clergy-house, is being formed in Plisen, the existing church accommodation being too small for the growing size of the town.—Herr Hatschek, a Vienna architect, has been commissioned to prepare plans for a new casino and concert hall at Raab.—An exhibition of German industry, trade, and husbandry is to be held at Brux, Bohemia; exhibitors are arriving in great numbers.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. T. Phillips Figgis is removing his offices on March 1, from 5, Adelaide-place to 28, Martin's-lane, Cannon-street, E.C.—Mr. Owen W. Davis, architect, is changing his address on March 1, from 1, Caroline-street, Bedford-square, to 27, Rutland-street, Hampstead-road, London, N.W.

APPOINTMENT.—It is stated that Mr. William Henman, Birmingham, has been selected by the Metropolitan Asylums Board to prepare designs for a residential school for children suffering from ophthalmia.

ARCHITECTURAL SECTION, GLASGOW PHILOSOPHICAL SOCIETY.—A meeting of the Architectural Section of the Philosophical Society of Glasgow was held, on the 14th inst., in the rooms, Bath street. Mr. D. MacBain presided. Mr. A. Lindsay Miller, the hon. secretary, read a paper descriptive of a holiday tour in the North of England, in which

he was accompanied by a number of the architectural students of the School of Art. Beginning at Carlisle, where the party spent several hours at the cathedral and other places of note in the city, the journey was continued to Naworth Castle, the seat of the Earl of Carlisle, the fine old hall and the apartments of "Belted Will" being visited. Lanercost Priory was next visited. At Hesketh the party were received by Mr. Gibson, under whose guidance several objects and places of interest were examined. The Roman wall in the district was also examined. The lecture was illustrated by numerous views taken by Mr. Miller during the excursion.

TEMPERANCE PERMANENT BUILDING SOCIETY.—In the report of the directors, presented to the general meeting of members of this Society on Wednesday, it was stated that the amount advanced during the year on mortgage of house property was 250,483l., an increase of 10,134l. The amount secured on mortgage at the end of the year was 921,354l., an increase of 64,083l. The total amount advanced on this class but securities were the foundation of the Society lately can therefore claim that it is carrying out, to a greater extent than any other building society in the United Kingdom, the object for which building societies were established, namely, to assist the industrious and provident classes to become owners of house property.

MANCHESTER SHIP CANAL COMPANY.—The half-yearly report of the company, to December 31, 1897, states that the gross receipts from the Ship Canal portion of the undertaking amounted to 107,333l., and showed an increase of 6,217l. as compared with the corresponding period of 1896. The increase of net revenue was, however, 11,554l., the working expenses being smaller, although the amount of traffic handled was larger. The rate of progress in 1897 was not so great as during the two preceding years, but an increase of 190,821 tons of sea-going traffic was not discouraging having regard to the strength of the opposition encountered, and the fact that some of the recent developments, and not yet had time to affect traffic receipts appreciably. The Engineer's report as to works states that the dredging required for the maintenance of the depth of water in the canal and docks has been carried on continuously during the last half-year. Since the closing of the tidal openings there has been a marked diminution of the dredging required in the tidal section, but on the other hand, other detritus, have been brought down to, and deposited in, the canal and docks by the rivers Mersey, Irwell, &c. The transporter for the wharf at the Warrington Dock entrance has been delivered after a lengthened delay, and is now in course of erection. In the Manchester and Salford docks the additional floors in the three-story sheds, have been completed and are in use. The works in connexion with the grain elevator at Trafford Wharf, and its accessories, are well advanced, and are being pushed forward to completion. The foundations of a new large transit shed, on the jetty between the Mersey and the docks, have been completed and are partly completed. Several extensions of the dock railways have been completed, and others are now in course of being executed. Many smaller works for the better equipment of the docks and sheds for traffic purposes have been carried out. The timber wharves and jetties constructed on the banks of the canal between Barton and Mode Wheel by the Anglo-Caucasian Co. Limited, the Liverpool Storage Co. Limited, Messrs. Bagnall & Co. Limited, and the Gas Committee of the Manchester Corporation, for the accommodation of the oil trade, have been completed and brought into operation. The superstructure of the Cold Air Stores on the north side of the canal at Venste is being erected by the Colonial Consignment and Distributing Co. Limited, and the formation and construction of the lay-by and jetties in connexion therewith are about to be undertaken. A wharf is in course of construction by the Manchester Patent Fuel Works, Limited, on the south bank of the canal above Barton Aqueduct, to enable patent fuel to be shipped for good condition. The slopes of the canal generally are in good condition.

GLASGOW CATHEDRAL.—On the 12th inst. the eighth of the winter course of art lectures was delivered in the Glasgow Corporation Art Galleries by Mr. T. L. Watson, his subject being Glasgow Cathedral. In introducing the subject, the lecturer referred to the influence upon the development of Gothic architecture exercised by the numerous and destructive fires which occurred in the large churches of the eleventh and twelfth centuries. In order to make their religious buildings enduring as well as beautiful, the whole energy of the designers was directed to the problem of covering them with stone vaulting, and this resulted in the evolution not only of the arch rib vault, but of the pointed style of architecture. The earliest building of importance at Glasgow, the church erected by Achatus in the early years of the twelfth century, was destroyed by fire

In 1176, and a parallel to this was found in Canterbury, where the choir of the Cathedral erected at the same time as the church of Achaia was burnt down in 1174. While we knew nothing about the destruction of the building at Glasgow beyond the date, a minute and picturesque description of the fire at Canterbury by an eye-witness, together with a valuable account of the operations which followed, had come down to us. From this we learned that the choir at Canterbury had been carried out with contrasted with the prolonged operations under Bishops Jocelyn, Walter, and Bonington at Glasgow. Several features of the cathedral were then referred to, the choir and lower church being described in some detail and illustrated with a series of views. This part of the building, it was stated, was almost wholly of the thirteenth century, a period when there was no appreciable difference between the architecture of Scotland and that of England. We had thus the broad basis of English archæology to ground upon, and in contrast with other parts of the building and with many other buildings in Scotland, its architecture was particularly clear. The architecture was of five distinct dates, each separated from the others by an interval sufficient to mark the development of the style. This development was indicated by a change of general design and by the introduction of a new type of moulding in the vaulting ribs in each section, which formed a regular sequence and illustrated the development of vaulting during the thirteenth century. The lecturer afterwards dealt in some detail with the sequence and approximate dates of the various portions of the structure, and with the methods and machinery employed in erecting large buildings such as the Cathedral in the thirteenth century.—*Scotsman*.

FISH MARKET, WEST SMITHFIELD.—The Corporation have transferred, at a cost exceeding 20,000l., the retail fish market to a new site in the middle of the flower and vegetable division at the north-west corner of the market area, and have there built another range of shops. The fruit, vegetable, and flower market—in lieu of Farringdon Market—was built by Messrs. Rudd & Son, of Grantham, and Messrs. Perry & Co., of London, after the designs of the late Alexander Peebles, City Architect, and opened on June 13, 1897. The fish market was first established May, 1883, in the building which had been erected for the sale of fruit and vegetables, and was subsequently opened, on December 11, 1889, for poultry and provisions, as the fish traffic therein had resulted in a heavy loss. Then, on November 7, 1888, was opened the second fish market, designed by the late Sir Horace Jones, and built by Mr. Mark Gentry. The Central Meat Market had been opened in 1869 by the late Alderman J. C. Lawrence, in the year of his mayoralty.

THE CALEDONIAN ASYLUM.—The Guardians of this charity have agreed to effect a sale for 13,370l. of the asylum buildings and site—i.e. 1a. 3r. 35 p., with a frontage of 250 ft.—in Caledonian-road, Holloway.

HALL'S SANITARY WASHABLE DISTEMPER.—This is a new sanitary water-paint, which possesses several good features. It sets hard, and in a few weeks it is said that it can be washed with impunity. It contains a small percentage of the well-known antiseptic and germicide cresylic acid, so that its purifying effect is greatly enhanced. It contains neither lead nor caustic alkali, consequently it is safe and cleanly in working, and its covering power seems to be considerable, as it is claimed that 4 lbs. of distemper thinned with 1 lb. of water will cover over 25 square yards of surface. The thick material can be used for filling up cracks and holes in the surfaces to be covered, as it sets firmly and in time becomes fairly hard. It is also claimed that it will set even on a damp wall, and that it will not scale off. If necessary, oil paint or varnish can be applied without preliminary sizing. The ranges of tints in which it is supplied is fairly wide and pleasing. Of course, the tests of time and practical experience are the only ones that can be relied upon with preparations of this kind; but, so far as our examination of the claims put forward by the manufacturers goes, we think that we can safely recommend a trial of the preparation to all requiring a reliable water-paint. The manufacturers are Messrs. Sissons Brothers & Co., Limited, Hull.

MAP OF LONDON RAILWAY AND TRAMWAY SCHEMES.—Mr. Edward Stanford (Charing Cross) has issued a map which will be useful to those who are interested in the various Metropolitan railway and tramway schemes now before Parliament. The map shows, in various distinct markings, railways proposed, railways sanctioned, and railways proposed, and tramways are shown under the same three headings. By means of three colours, combined with the use of continuous and dotted lines, all these six orders of railway and tramway lines, existing or proposed, are clearly defined and can be easily followed on the map.

WATER PAVEMENTS. The Sheffield City Council have decided to pave the Moor, one of the principal thoroughfares, with wood in preference to granite. At the meeting of the Council, a letter was read from Mr. T. de Courcy Meade, City Surveyor of Manchester, who referred to the wood paving in Moseley street, Manchester, where parts of the tramway would have to be taken up because of the expansion of the wood, which had gradually closed the tram rails.

He referred to King-street, which was laid with wood in 1859, and had to be taken up, turned, and repaired in 1895; and Exchange-street, which was paved with wood in 1890, and repaired in 1896. He fixed the average life of wood (creosoted beech) at fifteen years, and the life of granite at thirty years. Beech was the most suitable timber for wood paving. Summing up, the merits and demerits of granite and wood, Mr. de Courcy Meade said that, while wood was noiseless, granite was impervious, comparatively inexpensive, and exceedingly durable.

HULL MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Hull Master Builders' Association was held on the 17th inst., at the Grosvenor Hotel, when the President (Mr. W. G. Bray) occupied the chair. The usual loyal and patriotic toasts having been duly honoured, Mr. T. Goates, proposed the toast of "The Mayor and Corporation." Alderman Larard and Councillor Richardson replied. Mr. P. Gaskell then gave "Success to the Hull Master Builders' Association." He said that but a few years ago that Association was comparatively little known, but now they numbered some 220 members. The President congratulated the members upon the success of the Association. They had been very conciliatory towards the men when they asked for a rise in wages, and thus averted such a catastrophe to their trade as befel the engineers. During the evening a secretaire was presented to Mr. T. Goates in recognition of his three years' presidency; a silver tea and coffee service was also given to Mrs. Goates. The presentation was made by the President, and Mr. Goates replied.

SELL'S DICTIONARY OF THE WORLD'S PRESS AND ANNUAL OF USEFUL KNOWLEDGE FOR 1898.—This useful publication, which gives particulars of every newspaper published throughout her Majesty's dominions, together with the principal foreign papers, has just been issued. The new issue contains much information which will be of use to commercial men, including a list of Treaties of Commerce and Navigation between Great Britain and Foreign Powers; new legislation concerning Trade and Commerce, Session of 1897; Canadian Tariff, 1897; United States Tariff, 1897; United States and Canadian Retaliatory Commercial Legislation; United States and Status of Australian Federation, &c. The new issue, with its more comprehensive title, has been enlarged, and, besides being a dictionary of the World's Press, it has assumed quite an encyclopedic character.

THE MUNICIPAL YEAR BOOK, 1898.—The new edition of this work has been issued by Messrs. Edward Lloyd, Limited, Salisbury-square, E.C. The aim of the compilers has been to describe the work carried out by municipal authorities in the country, and they have succeeded in producing a book containing a great deal of useful information relating to municipal bodies. Under the heading of each town a description is given of the main features of its government. The chief features of the municipal code as applicable to London, England, Scotland, and Ireland, are described. This year's issue has been extended to include an account of work carried on by the larger District Councils. The "Year Book" is also a directory, containing lists of all the town councillors throughout the country, and the officials employed by the various authorities.

LOCAL GOVERNMENT ANNUAL, 1898.—This is the seventh year of publication of this little work, which contains, in addition to other useful information, a synopsis of all the previous year's legislation affecting local government; summaries of the "chief legal decisions of the year," "the chief powers of the London County Council," "the chief powers of the London Local Authorities," and statistical information dealing with "public health," "London," "the Poor Law," and other matters which come within the scope of local government. The work is published at No. 2, Dorset-street, Fleet-street.

ROMAN FIND AT LINCOLN.—A discovery has just been made in excavating for the purpose of laying the foundations of two new villas in Wordsworth street, Steep Hill, by the workmen of Mr. B. Fanthorpe, contractor, a piece of the original south wall of the city, about 30 ft. wide, being laid bare. It runs in a direct line from east to west, and experts who have seen it have no hesitation in stating it to be a part of the old south wall. An arch on the same level spanned the Steep Hill near the Leaning Inn. The wall is in a very sound condition.—*Lincolnshire Echo*.

THE CLAIM BY ABERDEEN BUILDERS.—At the meeting of the Aberdeen School Board on the 17th inst., the Administration Committee reported having received a letter from Messrs. Allan, Buckley Allan, & Milne, advocates, intimating that the contractors of the Westfield School had instructed them to obtain payment of their claims for breach of contract, and appending a statement of the same, the amount of which was found to aggregate 958l. 18s. payment being asked forthwith in view of past delay. The letter was held to be referable to the Litigation Committee. This Committee met at the close of the Board meeting. On reference to the minutes, the Committee found that the claims stated therein were greatly in excess of the sums which the contractors had formerly agreed to accept, and the Clerk was instructed to inform Messrs. Allan, Buckley, Allan, & Milne of that fact, and to say that

meantime the Board would consider the question and communicate their decision in the course of a week. It is understood that, failing an early and satisfactory settlement of the claims, an action will be raised in the Court of Session. It may be added that the contractors agreed some time ago to accept certain sums if they were paid at once, but the Board did not pay these amounts at the time nor since, and accordingly the contractors consider that the provisional agreement was broken by the Board and not by them. The Board failed to implement the arrangement, more delay has occurred, and higher damages are consequently demanded.—*Aberdeen Journal*.

FEDERATION OF EMPLOYERS IN THE BUILDING TRADES.—A meeting was held at the Adelphi Hotel, Liverpool, on the 9th inst., when nearly all the leading building firms of Manchester, Liverpool, and districts were represented. Mr. Robert Neill, jun., J.P., was elected first President, and other officers and a strong executive board were duly appointed to carry out the scheme of district federations throughout the country. This was inaugurated at the meeting of the National Association of Master Builders of Great Britain, held in London at the Builders' Institute in January, when it was resolved that the whole of the building trades should be federated together to receive and consider the demands which the workmen are now making upon the masters in nearly every large centre of business operations. In consequence of what are considered the aggressive and unreasonable demands, notices of which have recently been received from the operatives by the employers in the building trades in the Manchester and Liverpool districts, the employers have felt compelled to federate for mutual protection. Similar organisations have already been started in Lancashire, Yorkshire, West and South of England, and the Midlands. These in due time are expected to become one huge federation of the building trades, presided over by the National Association of Master Builders of Great Britain, established over twenty years ago. By this arrangement a scheme will be arranged to embrace all local associations throughout the country, which will become affiliated with the federated areas. These in their turn will be presided over by the National Association of Master Builders. The object of this Employers' Federation is to form a powerful combination of employers to counteract the trades-unions, particularly in regard to interference with the management of works and freedom of employment.

APPOINTMENT OF SANITARY INSPECTORS.—The Local Government Board has sanctioned the appointment of the following persons as sanitary inspectors in the undermentioned districts:—Mr. A. Chuter in Battersea, Mr. R. J. Sheppard in Hackney, Mr. G. White in Hackney, Mr. G. Rackham in St. Pancras.

BOROUGH ENGINEER, SOUTH SHIELDS.—At the January meeting of the South Shields Town Council Mr. Matthew Hall, the Borough Engineer and Surveyor, tendered his resignation after holding that office for nearly thirty years. Mr. Hall was appointed in October, 1868. The population at that time was about 42,000 and the rateable value 90,000l.; the population is now 97,000 and the rateable value 318,000l. During the time he has held office he has carried out main drainage works, Corporation stables for fifty horses with houses for superintendent and horsekeeper, cartwright's shops, &c., twelve miles of tramways with stabling, &c., an infectious diseases hospital, three branch police buildings, &c. He also superintended the laying out of the Marine Parks near the sea-side. Mr. Hall will enter into partnership with his son, who is already established in the town as an architect and surveyor. In consideration of his long service with the Corporation, the Council has appointed him for a term of seven years as "Consulting Borough Engineer" at a salary of 150l. a year.

PUBLIC IMPROVEMENTS, WOLVERHAMPTON.—A brief outline of the work done in the Wolverhampton Borough Surveyor's Department during the past year has been issued by Mr. Bradley. Public street improvements have been made in Wadham's-hill, Dudley-road, Cannock-road, and Green Lanes, Lord Barnard giving, in the last instance, some 671 super yards of land to the roadway. Plans and estimates have been prepared in respect of the Exchange Hall improvement. Many trees have been planted in the streets, and there is now a total of 664. New street name plates have been fixed in 100 streets, and the houses in fifteen streets have been numbered, 922 building plans have been reported on and approved, as compared with 383, 419, 536, 514, and 885 in the five preceding years. The total number of houses and shops approved is 651, and affording accommodation for over 3,000 persons. The floor space provided in the new workshops, warehouses, and factories amounts to 26,000 super yards. Plans have been prepared for new baths, at an estimated cost of 15,000l., and it has been decided to proceed at once with the large swimming bath, 220 ft. by 52 ft., and borrowing powers have been obtained for the necessary expenditure.

GLASGOW BUILDING TRADES' EXCHANGE.—The members of the Glasgow Building Trades' Exchange held their first annual dinner on the 10th inst., in the Windsor Hotel, St. Vincent-street. Colonel Robert J. Bennett (President) occupied the chair. The loyal and patriotic toasts having been duly

honoured, Mr. James Goldie gave the toast of "The City of Glasgow," and Baillie Dick responded. Mr. Peter Lawrence then proposed the toast of the evening, "Glasgow Building Trades' Exchange." In doing so, he said that the first building exchange to be established in Scotland was that of Glasgow, and now similar institutions had been formed not only in Edinburgh but in other parts of the country. He hoped many more would be established, because they had a beneficial influence.—The Chairman, in replying, said he was very gratified to see such a large gathering at the first dinner of the Glasgow Building Trades' Exchange. It was a clear indication that the Exchange was a living factor in their midst, and he assured them that to those who had come through the worry and stress, to say nothing of the anxiety, of building up such an institution, it was particularly gratifying. The membership had increased rapidly, and at the present time there were 300 members with a prospect of a good and useful career before them. The Exchange had done great good to the building trades. If it did nothing more, it at least cemented friendships among its members. They were, however, working silently but surely in every matter in which they felt it was for the good of their trade and the public interest. In these degenerate days, when prices were cut to the lowest point, and Corporations and co-operative societies were loud in the land, it was proper that such associations as theirs should be formed, so that all who honoured their trade should stand shoulder to shoulder, and guarantee good work, and ask a fair price for it. He trusted the day was not far distant when every city of importance in Scotland would follow in their footsteps, and have an exchange of their own.—Mr. John Laird gave "The Merchants' and Trades' Houses of Glasgow," and the Lord Dean of Guild and the Deacon Conventor replied. Other toasts followed.

POTTERY.—Mr. William Burton delivered his second lecture at the Manchester Art Gallery, on the 8th inst., on "Material and Design in Pottery." According to the *Manchester Courier*, he said that of the finer kinds of earthenware the Persian, Rhodian, and Turkish faience and the Damascus wares had a siliceous "slip"—that is, a coating upon the body which before being fired could have certain pigments laid upon it at discretion. The Hispano-Moresque, Rouen, and Delft wares, as also Italian majolica, had an enamel or glaze in which oxide of tin played an important part. Here, again, the influence of material on design was apparent. The siliceous glaze could be coloured red or green by oxide of copper, blue by oxide of cobalt, and purple by oxide of manganese; while the tin enamel prohibited the development of purple and red, but admitted in their stead the fine orange and yellow colours for which certain Italian ware is celebrated. The Greeks, on the other hand, with all their genius for outline, had little command of colour, and their work was deficient in this respect. Even the Egyptians of 4,000 years ago were ahead of them, and the advance in colour production appeared to have spread from that country to Assyria and Persia, back again to Greece, and also, through the Moors, to Spain and Western Europe. Many examples of ornament were shown, either by actual specimens or lantern slides, to illustrate the influence upon it of the materials and processes at command. Nearly two centuries ago the Staffordshire potters discovered a means of compounding a mass which, when fired, was altogether white, and, in addition, more plastic than any that had been previously known. From this period dated the manufacture of plates, dishes, and the like, by machinery; these, though devoid of the individuality and decorative spirit of the work made separately under personal effort, were yet more uniform and useful, and vastly cheaper. The influence of this discovery had dominated the pottery industry of the whole world, partly for good and partly for evil.

PRINCES' HALL, PICCADILLY.—The Princes' Hall Restaurant Company, having taken an under-lease of Rawlings' Hotel, Jermyn-street, (Nos. 37-8), together with part of No. 36 in that street, are about to rebuild those premises as an addition to the restaurant in Piccadilly, opened by them (after conversion of the concert-hall and other parts of the hall) in May, 1896. For the new buildings plans have been made by Messrs. J. T. Wimpey & Arber—these include a "Masonic Temple," for banquets given by various metropolitan lodges, and the estimates for cost and furnishing amount to about 30,000. Princes' Hall, where are now the Royal Institute of Painters in Water Colours and the Institute of Painters in Oil Colours, was built by Messrs. Peto Bros. after Mr. E. R. Robson's designs; the busts on the façade were by Mr. Onslow Ford. In the *Builder* of March 13, 1886, we published an illustration of the doorway, of which the two symbolic figures are by Mr. Verheyden, and the foliage, lettering, &c., by Mr. McCulloch.

CAPITAL AND LABOUR.

CARDIFF MASONS' STRIKE.—On the 11th inst., the Executive Committee of the West of England and South Wales Master Builders' Federation held a meeting at the Guildhall, Bristol, under the presidency of Mr. A. Krauss (Bristol), to consider the Cardiff masons' strike. Representations were made

with reference to the dispute from Cardiff, Newport, Cheltenham, Gloucester, Bridgwater, Plymouth, Bath, and Weston-super-Mare, and the Chairman, having explained the object of the meeting, called on Mr. J. E. Turner, President of the Cardiff Master Builders' Association, to make a statement with regard to the origin of the strike. This Mr. Turner did, and eventually the President moved, and Mr. G. J. Long, President of the Bath Association, seconded, and Mr. F. N. Cowlin (Bristol) supported, the following resolution:—(1) That the West of England and South Wales Master Builders' Federation having at a special meeting held this day heard and carefully considered the situation of the operative stonemasons' strike with the Cardiff Master Builders' Association, the Executive of this Federation concurs in the action of the Cardiff Association, and promises it its heartiest support." The resolution was carried, and a meeting at Cardiff, held subsequently, the men decided to accept the modified conditions arranged with the masters, and work has since been resumed. The text of the new rules is as follows:—(1) That no worked stone for contract work be imported from other towns paying a lower rate of wages than that paid in Cardiff, excepting masons' spandrel, and new-entrances, steps, Yorkshire or Dorset or Vales Master Builders' square, single or double chamfered copings, which may be procured from any locality. Wrought granite and marble, stone chimney pieces, and fender curbs are excepted from the restriction of this rule. (2) No restriction is to be placed upon the supply of dressed stone by members of the C.M.B.A. to any other person, subject to the above said conditions of this rule. (3) That no sub-letting by piecework labour will be allowed, and that no sub-contracting will be countenanced by either party. (4) Sub-contracting is to be deemed to mean the sub-letting of any portion of a contract involving the whole of the labour and material fixed and completely finished by the contractor in the building.

STATE OF EMPLOYMENT IN JANUARY.—Employment at the end of January was not so good as a year ago. Compared with a month ago the returns show some improvement, but it is to be remembered that the previous month's figures were somewhat affected by suspension of work at Christmas. The January returns apply to a period before the resumption of work in the engineering trade, and employment in the shipbuilding and kindred trades still shows the adverse effects of the stoppage. In the following figures persons directly on strike or locked out have been omitted, but the indirect effect of the stoppage is very marked. In the 116 trade unions making returns with an aggregate membership of 461,544, 22,870 (or 4.96 per cent.) were reported as unemployed at the end of January, compared with 5,34 per cent. at the end of December, 1897, and with 3.3 per cent. in the 115 unions, with a membership of 454,342, from which returns were received for January, 1897. Employment in the building trade has improved, and the general good. The percentage of unemployed union members was 2.0 at the end of January, compared with 2.4 at the end of January of last year.

LEGAL.

PENALTIES AGAINST A BUILDER.

MR. GEORGE E. BAINEY, builder, Forest Gate, was summoned on the 12th inst., at the Stratford police-court, by the East Ham Urban District Council for penalties in respect of non-compliance with an order made by the Court. In October last defendant was summoned and fined 10s. for failing to remedy defects in a house at 40, Rutland-road, East Ham, a house owned by him. An order was also made to do the work with a continuing penalty of 10s. a day till it was done. But the defendant did not do the work, and the Council thereupon stepped in and remedied the defects at a cost of 11.8s. 10d. The work was completed on January 14. Mr. W. B. Whittingham (the Chairman) said it would be useless for the bench to make orders of this sort unless they were enforced. The previous order of the Court would now be adhered to, and defendant would have to pay 10s. a day from the date of the order till the date of the completion of the work, viz., sixty-seven days. Defendant must also pay 11.8s. 10d. the cost of the work done by the Council, and 10s. 6d. Court costs—amounting in all to 35l. 9s. 4d.—*Morning Post*.

MEETINGS.

FRIDAY, FEBRUARY 25.

Architectural Association.—Mr. F. W. Troup on "Leadwork, Plain and Decorative" (with practical demonstrations). 7.30 p.m.
Royal Institution.—Captain Abney on "The Scientific Principles of Modern Colour Photography." 9 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. C. E. Wolf on "The Problem of Train Resistance." 8 p.m.

SATURDAY, FEBRUARY 26.

Builders' Foremen and Clerks of Works' Institution.—Annual Dinner, King's Hall, Holborn Restaurant. 6 p.m.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Aylesbury Dairy Company's premises, Bayswater. 3 p.m.

MONDAY, FEBRUARY 28.

Carpenters' Hall, London-wall (Free Lectures on Matters connected with Building).—Professor T. Roger

Smith on "Some Notable Buildings in France," with lantern illustrations. 8 p.m.

London Institute.—The Rev. Canon Benham on "St. Paul's Cathedral." 5 p.m.

Society of Arts (Lectures).—Mr. Hugh Stannus on "The Principles of Design in Form." 4.11. 5 p.m.

Institution of Junior Engineers.—Visit to the Westinghouse Brake Company's Works, York-road, King's Cross. 3 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—8 p.m.

TUESDAY, MARCH 1.

Institution of Civil Engineers.—Papers to be further discussed:—(1) "The Theory, Design, and Practical Working of Alternate-Current Motors," by Mr. Llewellyn B. Atkinson. (2) "Dublin Electric Tramway," by Mr. H. F. Parshall. 8 p.m.

WEDNESDAY, MARCH 2.

Royal Archaeological Institute of Great Britain and Ireland.—(1) Viscount Dillon, President, on "Tilting in Tudor Times." (2) Mr. A. F. Leach, F.S.A., on "The Origin of Sherborne School, Dorset." 4 p.m.

British Archaeological Association.—Mr. T. Cato Worsfold on "The French Stonehenge." 8 p.m.

Society of Arts. 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection in the Parish of St. George's, Hanover-square. 4 p.m.

Northern Architectural Association.—Mr. Chas. T. Marshall on "The new illuminant Acetylene Gas, with special reference to the lighting of buildings by the same; with illustrations." 8 p.m.

Perth Architectural Association.—Mr. Andrew Wilson on "Gasworks Construction." 8 p.m.

Edinburgh Architectural Society.—Mr. A. Hunter Cawford on "A Combined System of Steam Heating and Cooking and Domestic hot-water Supply." Illustrated by a working model. 8 p.m.

THURSDAY, MARCH 3.

Society of Antiquaries.—Ballot for the election of Fellows. 8.30 p.m.

Society of Arts.—Professor J. A. Fleming on "Recent Researches in Magnetism and Diamagnetism." 3 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Wynter Blyth on "Sanitary Laws and Regulations Governing the Metropolis." 8 p.m.

Institution of Civil Engineers.—Students' visit to the works of Messrs. John I. Thornycroft & Co., Chiswick. 2.30 p.m.

Society for the Encouragement of the Fine Arts.—Mr. W. Law Bross on "Primitive Ireland." 8 p.m.

FRIDAY, MARCH 4.

Royal Institution.—Prof. H. E. Thorpe on "Recent Results of Physico-Chemical Inquiry." 9 p.m.

SATURDAY, MARCH 5.

Perth Architectural Association.—Visit to the Free Library. 4.30 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Works, Kingston-on-Thames. 3 p.m.

British Institute of Certified Carpenters (Carpenters' Hall).—Mr. C. T. Aston on "Shoring." 6 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until April 2.

1897. 2,934.—A WORKMAN'S BOTTLE: A. Stephenson. For cleaning out inside the bottle has its tapered (upper) portion fixed by a hinge, opening by means of a spring-bolt and hasp.

2,935.—PAVING-BLOCKS OR TILES: Stuart & Robert. 299.—To keep the block or tile from the surface during the setting of its material a mould or die is devised with removable bottom, with a follower or press-plate, and swivelling retaining pawls at the upper part of the die or moulding box.

2,936.—CHIMNEY TOIS: Ottens & Elenbach.—This is fitted with oscillating flaps, suspended before openings on each side of the top, bent at their upper ends, and lying on their edges to easily turn in the ends of the borders of the cover, which are bent in the opposite direction.

2,937.—HOT-WATER SUPPLY TO RESTAURANTS, LAVATORIES, &c.: F. Lemplough.—The apparatus comprises a connected boiler and container, main gas-burners for heating water, by-pass gas-burners to maintain the water's due temperature, water-pressure regulators, and gas-regulating appliances; an automatically operated valve, and valve to permit escape of steam, ratchet wheel on axes of delivery valve, and a stop-pawl to prevent rotation of the valve until the water has reached the desired temperature are also covered by the invention.

2,940.—WINDOWS AND DOORS: D. Keith.—For casement windows whose lower and upper casement frames or sashes swivel out from one side hinges are fixed upon their opposite sides, so that the sash-frame can slide up and down and swivel within the room; for doors, a recess in the top lintel affords space for the sliding up-and-down action on the hinges and counter-weight chain, whilst a corresponding recess below the floor level admits of ventilation through an open space at top of the door.

2,949.—APPARATUS FOR TEACHING MODEL DRAWING: J. Tenillon.—A square, oblong, or circular skeleton frame is fitted to and slides upon another frame containing a sliding sight-hole; this can be fixed by a bolt to a desk or easel, and focussed in direction of the model; by means of fine wires, which can be held over one of the sides, and held by clip springs or threaded through holes, the figure can be delineated.

2,952.—FIRE-ESCAPES AND THEIR CARRIAGES: L. de L. Wells of the H.F.S.J.—For the conveyance of fire-escapes on vehicles provided with shafts for travelling on their own wheels; the escape can be readily hauled up on anti-friction wheels or rollers supporting its axle into that position in which it will be over one of the axles of the carriage; also the arrangement on the folding ladders of the escape of two sets of drums for adjusting, with ropes and links, the positions of the ladders, and the fitting the ladders with side-bars having ribs or webs projecting at the inner sides of their upper edges.

2,954.—MANUFACTURE OF WHITE LEAD: T. C. Sanderson.—A precipitated white lead of high density produced by adding successive quantities of carbonic acid

91 718; 811 101 1001

Those marked with an asterisk (*) are advertised in this Number Competitors p. iv. Contracts, pp. iv vi. & viii. Public Appointments, pp. xix & xxi.

ton—20, Craster-rod, u.t. 78 yrs., g.r. 74. 10s.
 100 yds. to Grove-avenue, f.g.r. 58, reversion
 751. Abbey-lane and "Fern-cottage," u.t.
 245 303 yrs., g.r. 116.
 600 to Providence-rod, u.t. 31 yrs., g.r. 101.
 155 and 9, Providence-pl., u.t. 15 yrs., g.r. 12. 15s.
 By ARTHUR BARTON.

bury—18, Finsbury-sq., beneficial lease for
 12 yrs., r. 170.
 ley—Anley-vale, f.g.r. 44. 12s., reversion in
 53 yrs.

By GREEN & SON (of Hammersmith).
 160 100 yds. to Grove-avenue, f.g.r. 58, reversion
 in 93 yrs.

ckenham—Beaconsfield-rod, f.g.r. 45, reversion
 in 93 yrs.
 1,255 dominion-rod—Muriel-st., &c., f.g.r. 101. 15s.
 reversion in 234 yrs.

1,800 Lambeth—346 and 348, South Lambeth-rod,
 u.t. 41 yrs., g.r. 184. 14s.
 By ROBERT SMITH & CO.

2,300 29, Denmark-st., f.r. 214. 17s.
 1,950 Richmond-bldgs., f.r. 100.
 By W. G. SHADRAKE.

1,200 100 yds. to Grove-avenue, u.t. 76 yrs., g.r.
 54. 10s., r. 261.
 By BRODIE, TIMMS & CO.

1,400 100 yds. to Grove-avenue, f.g.r. 58, reversion
 in 93 yrs.
 1,400 100 yds. to Grove-avenue, f.g.r. 58, reversion
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 1,400 100 yds. to Grove-avenue, f.g.r. 58, reversion
 in 93 yrs.

285

1,750

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8,600

1,500

2,300

1,950

285

3,950

610

1,400

570

1,075

450

50,000

12,010

1,650

1,100

3,100

1,505

245

255

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TENDERS.

[Communications for insertion under this heading
 should be addressed to "The Editor," and must reach us
 not later than 4 a.m. on Thursday. N.B.—We cannot
 publish Tenders unless authenticated by the name and
 address of the sender; and we cannot publish announce-
 ments of Tenders accepted unless the amount of the Tender
 is given, nor any list in which the lowest Tender is under
 £100, unless in some exceptional cases and for special
 reasons.]

ABERDEEN.—For the erection of warehouse, Millbank,
 Byrdend-rod, for the Northern Co-operative Company, Limited.
 Mr. R. G. Wilson, architect, 18A, Union-street, Aberdeen.—
 Carpenter—Alex. Hall.
 Slatting—Adam & Co.
 Plumber—Thom & Strach.
 Plastering—George Leith.
 Painting—John Williamson.
 [All of Aberdeen.]

ASHTON-UNDER-LYNE.—For paving, flagging, &c., Pole-
 street and others. Mr. J. T. Marshall, C.E., Town Hall, Ashton.—
 R.C. Pab, Ashton-under-Lyne.
 W. Shierley, Ashton-under-Lyne.
 Wm. Neal, Ashton-under-Lyne.
 [Accepted.]

BECKENHAM.—For the supply of Guernsey granite (1,000 cubic
 yards) for the Urban District Council. Mr. J. A. Angell, Surveyor,
 Council's Office, Beckenham.—
 Guernsey Granite.

W. Griffiths.
 A. F. Mansel.
 Fry Bros.
 Mowlem & Co., Westminster (accepted).
 L. Sommerfeld.
 [Accepted.]

BOSTON SPA.—For alterations to shop premises, &c. Messrs.
 T. Buttery & S. B. Birds, architects, Old-street, Maysey.—
 G. W. Hunter, Boston Spa.
 [Accepted.]

BOURNEMOUTH.—For making up Campbell, Heath Farm,
 Richmond Park, and Shaftesbury roads, Bournemouth. Mr. F. W.
 Lacey, Borough Engineer and Surveyor.—
 George Troake.
 W. H. Saunders & Co. (accepted).
 [Accepted.]

BOURNEMOUTH.—For making up Churchill and Westbourne
 Park roads, Bournemouth. Mr. F. W. Lacey, Borough Engineer and
 Surveyor.—
 George Troake.
 W. H. Saunders & Co. (accepted).
 [Accepted.]

BOURNEMOUTH.—For wrought-iron fencing and gates for
 Horse Shoe Site, Bournemouth. Mr. F. W. Lacey, Borough
 Engineer and Surveyor.—
 F. Morton & Co.,
 Limited.
 Dorset Iron Foundry.
 Company.
 [Accepted.]

BRISTOL.—For the erection of additions to the "Pack Horse
 Hotel," Lawrence Hill, for the Bristol United Breweries Company.
 Messrs. Gignell & Bond, architects, 51, Corn-street.
 Eastbrook & Sons.
 J. Perkins.
 G. Humphreys.
 [Accepted subject to the omission of pitch pine seating.]

ENFIELD.—For the erection of six houses at Little Park,
 Enfield. Mr. John B. Thorpe, architect.—
 E. & W. Newman.
 L. & W. H. Parnham.
 [Accepted.]

EXMOUTH.—For additions to No. 15, The Parade, Exmouth.
 Mr. J. Fulford, Mr. M. Chubb, architect, & Bedford-
 street, Exeter. Quantities by architect.—
 Robert Austin & Co.
 White.
 [Accepted.]

FRINTON-ON-SEA (Essex).—For the erection of a school for
 150 children, for the School Board. Mr. Samuel T. T. James,
 architect, Frinton. Quantities by Messrs. Kemp, Welch, & Thomas,
 Bournemouth.—
 McKay.
 Babbam & Co.
 Myall & Ellis.
 T. Canham.
 W. H. Dixon.
 [Accepted subject to the consent of the Education Department.]

GRAVESEND.—For the erection of (a) market buildings, and (b)
 fire-engine station, mortuary, &c., for the Town Council. Mr.
 Edmund J. Bennett, architect, 4, Darnley-road, Gravesend.
 Quantities by Mr. W. Hawker.—
 Thomas & Edge.
 Rayfield.
 Gorse.
 Martin & Co.
 Tuffer.
 Mutton & Wallis, Gravesend.
 [Accepted.]

GRAYS (Essex).—For the erection of two houses, Clarence-road,
 Grays. Mr. Christopher M. Shiner, architect.—
 J. H. Carter.
 J. Brown.
 [Accepted.]

GRAYS (Essex).—For the erection of hot-water work to Bridge-
 road, Grays, for Grays School Board. Mr. Christopher M. Shiner,
 architect.—
 P. N. Haydon & Sons.
 W. Shirell.
 [Accepted.]

GRAYS (Essex).—For alterations at the Grove, for Mr. E. W.
 Brooks. Mr. Christopher M. Shiner, architect.—
 H. K. Rons.
 J. Lawrence.
 [Accepted.]

HANLEY.—For the erection of a warehouse at Lichfield-street
 Place, Mr. W. A. Bayes, architect, 2, Beaumont-street, Piccadilly,
 Hanley. Quantities by the architect.—
 A. Ogden.
 T. Chadfield.
 [Accepted.]

HANLEY.—For the erection of Potts's Oven at Lichfield-
 street Pottery. Mr. W. A. Bayes, architect, Hanley.—
 H. K. Rons.
 C. Cornes & Sons.
 [Accepted.]

HALIFAX.—Accepted for the erection of business premises,
 Fenton-road, King Cross, for Mr. E. L. Dutton. Mr. L. T. Pritchett,
 architect, George Street-chambers, Halifax.—
 Excavating, Masonry, and Bricklaying.
 B. Riley, Lewis-street, Halifax.
 Carpentry and Joinery.
 J. Dyson & Son, King Cross, Halifax.
 Ironfoundry.
 J. Berry, New Bank Foundry, Halifax.
 Plumbing and Glazing.
 J. Naylor, Cheap-side, Halifax.
 Slating and Plastering.
 J. Bancroft & Son, Winding-road, Halifax.
 [Accepted.]

HARROGATE.—Accepted for the execution of road works,
 Weymouth-road, &c., for the Corporation. Mr. S. Stead, Borough
 Surveyor, Town Hall, Harrogate.—
 Weymouth-road.
 Henry Leadham, Little Wonder, Harrogate.
 Robert-road.
 Henry Leadham, Little Wonder, Harrogate.
 Back Road at Rear of Robert-road.
 Henry Leadham, Little Wonder, Harrogate.
 [Accepted.]

HULL.—Accepted for additions to shop near Hestle-road. Mr.
 E. Whitlock, architect, 20, Scale-lane, Hull.—
 Bricklaying and Plastering—Whincop, Dee-
 street, Hull.
 Carpentry—Whincop, Dee street, Hull.
 Plumbing—Smith, Hestle-road, Hull.
 Slating—Dewick, 15, 15.
 Slating—Smith & Hunter, Ocean-place, Hull.
 Painting—Dewick, Cromwell-terrace, Hull.
 [Accepted.]

ILKLEY.—Accepted for the erection of steam laundry buildings,
 for the Sanitary Steam Laundry Company, Limited. Messrs.
 Rensdell & Clitchley, architects, The Grove, Leeds.—
 Masonry—Taylor & Watkins, Ilkley.
 Idley, near Leeds.
 Ironfoundry—Taylor & Parsons, Bradford.
 Slating—K. Nelson, Ilkley.
 Plastering—H. Richardson, Ilkley.
 Painting—J. G. Boden, Ilkley.
 Plumbing—H. Garside, Ilkley.
 [Accepted.]

LANEY.—For the erection of three villas, New-road,
 Lanes, for Mr. J. Morris, Lanes. Mr. W. Griffiths, architect,
 Lanes.—
 T. & J. Brown.
 J. Evans.
 G. Mercer.
 [All of Lanes.]
 [Accepted.]

LANEY.—For alterations to "Brynawel," Lanes, for Mr.
 J. Wesley Jones. Mr. W. Griffiths, architect, Lanes.—
 T. & J. Brown.
 J. Evans.
 G. Mercer.
 [All of Lanes.]
 [Accepted.]

LONDON.—For the erection of a new refreshment house at
 Tooting Common, for the London County Council.—
 W. H. L. Jones.
 J. H. Ham & Son.
 R. H. Galbraith.
 General Builders, Ltd.
 [Accepted.]

LONDON.—For pulling down and rebuilding "The Brewery"
 Tap, Kent House-lane, Sydenham, for Messrs. J. Campbell, John-
 stone & Co., Ltd. Mr. J. H. Richardson, architect, 37, Finsbury-
 pavement, E.C.1.—
 Reynolds.
 Wumpkin.
 Westcott & Co.
 Kilbey & Gayford.
 Beer & Gash.
 Ransome.
 Richards.
 Bendon (accepted).
 [Accepted.]

LONDON.—For works of painting and repair at Blackheath,
 Dulwich Park, and Ladywell Recreation-ground, for the London
 County Council.—
 Blackheath.
 C. G. Jones.
 T. Laphorne & Co.
 W. O. Graves.
 W. Ashcroft.
 E. Proctor.
 [Accepted.]

LONDON.—For erecting workshops in Central-street and
 Povey-street, St. Luke's, E.C., for Mr. G. Wheeler. Mr. A. K.
 Stephens, architect, 210, Goswell-road, E.C.1.—
 E. & Cole.
 J. Carmichael.
 I. Grover & Son.
 J. Garrett & Son.
 [Accepted.]

LONDON.—For the erection of school, Eldon-road, Lower
 Edmonton, Mr. H. A. Bayes, architect, 2, Beaumont-street, Piccadilly,
 Hanley. Quantities by the architect.—
 H. W. Dobb, architect, 118, London-wall, E.C.4.
 Messrs. Young & Brown, 7, Southampton-street, W.C.2.
 C. Gray Hill.
 E. Lawrence & Son.
 [Accepted, subject to the approval of the Education Department.]

PRICES CURRENT OF MATERIALS.

TIMBER.		TIMBER (continued).	
Heart, B.C.	ton 0/6 0/6	Satin, Porto Rico	0/10 0/10
do, E. I. load	15/0 15/0	Walnut, Italian	0/10 0/10
do, U.S. f.c.u.	1/8 1/8	METALS.	
do, Canada, load	3/10 4/10	Iron—Pig, in Scott-	ton 0/10 0/10
do, do, do	2/10 4/10	Bar, Welsh, in	ton 0/10 0/10
do, do, do	1/10 3/10	Do, do, at works	in 0/10 0/10
do, do, do	2/10 3/10	Do, Staffordshire,	in 0/10 0/10
do, do, do	1/10 3/10	Do, London, in	0/10 0/10
do, do, do	1/10 3/10	COPPER—British	cake and ingot 50/10 50/10
do, do, do	1/10 3/10	Best selected	50/10 50/10
do, do, do	1/10 3/10	Sheet, strong, 50	10/10 10/10
do, do, do	1/10 3/10	Chill bars, 50	10/10 10/10
do, do, do	1/10 3/10	YELLOW METAL	do, do, do
do, do, do	1/10 3/10	do, do, do	do, do, do
do, do, do	1/10 3/10	do, do, do	do, do, do
do, do, do	1/10 3/10	do, do, do	do, do, do
do, do, do	1/10 3/10	do, do, do	do, do, do
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do, do, do	1/10 3/10	do, do, do	do, do, do
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do, do, do	1/10 3/10	do, do, do	do, do, do
do, do, do	1/10 3/10	do, do, do	do, do, do
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do, do, do	1/10 3/10	do, do, do	do, do, do
do, do, do	1/10 3/10	do, do, do	do, do, do
do, do, do	1/10 3/10	do, do, do	do, do, do
do, do, do	1/10 3/10	do, do, do	do, do, do
do			

LONDON.—For pulling down and rebuilding corner house, No. 41, Spencer-street, St. George's East, for Mr. Geo. Crutcher. Messrs. Andrew Gray & H. Norman Gray, surveyors, 334, Commercial-road, E.

	Extra if party walls are rebuilt.	Total.
J. Howlett & Son.....	£375 0	£395 0
C. Mantor.....	£12 10	£32 10
J. F. Holdiday.....	£45 10	£38 0
E. Hardy (accepted).....	50 0	50 0

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W. C. Eady..... £1,598 1
Summersford..... 2,122 1
Ham & Son..... £1,998 1
W. Lewin..... 1,942 1

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Rider & Sons..... 1,972 1
Ward & Lambie..... 1,998 1
Wall & Co..... 1,998 1
Larke & Sons..... 1,998 1

MANCHESTER.—For alterations to "The Talbot Hotel," Ladyham, near Manchester, for Mr. Conductor F. Murray. Messrs. C. K. & T. C. Mayor, architects, 41, John Dalton-street, Manchester. Quantities by Mr. Stone, King-street, Manchester..... £2,685 1
W. Wood..... £2,685 1
F. Aliman..... 610 1
F. E. Haynes..... 548 1
G. Macfarlane..... 333 1

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Accepted.

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D. Sharp..... £2,685 1
E. G. Munter..... £2,685 1

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C. J. (list appeared in our last issue).—J. C. J. M. (amounts should have been stated).

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Design as Influenced by Circumstance.



TO formulate a short, comprehensive, and attractive title for a book dealing with a very large subject, and with various aspects of it, is often a difficulty. In selecting the title "The Bases of Design" for the collective publication of his lectures delivered to the students of the Manchester Municipal School of Art,* Mr. Walter Crane has succeeded in satisfying those conditions, but (as is not unfrequently the case) rather at the expense of accuracy of definition. The title suggests a more serious and philosophical work than this can be said to be; and though race and climate, for example, undoubtedly influence design, we do not see that they can be well said to be among the bases of the art; they are circumstances which modify it. The title we have given to this article would more correctly describe a great part of the contents of Mr. Crane's book; but we admit that it would not look nearly so attractive in a publisher's catalogue. The first two chapters, however, on "The architectural basis" and "The utility basis," do come properly under the heading of the title; they deal with causes which are actually at the root of the forms and methods of design. We do not know that they contain anything very new; but in a book addressed mainly to students truth is more important than novelty. At the outset of the first chapter the author, indeed, dignifies his subject by drawing attention to one aspect of it which is often overlooked; its immense and far-reaching importance in the history of mankind, the endless complexity of the forms which the word "design" covers, the enormous range from, say, the grass mat of the first plaiter to the finest Persian carpet, or from Stonehenge to Salisbury Cathedral "and were we to attempt to trace, step by step, the true relation between the diverse and multitudinous characteristics which such contrasts suggest, we should be tracing the cause of the development of human thought and history

themselves." This is going a little too far, for one does not see how Aristotle and Bacon, Averroes and Spinoza, are to be included under the history of design, but it is pardonable exaggeration on the part of an artist who recognises truly that the subject, is at all events, far greater and more significant than the majority of persons realise.

Mr. Crane, like a good many other decorative artists of the modern epoch, finds the original and controlling bases of design in architecture, "the queen and mother of all the arts." In asserting this, he adds—

"one does not lose sight of the view that *all art is primarily, the projection or precipitation in material form of man's emotional and intellectual nature*; but, being projected and taking definite shape, it becomes subject to certain controlling forces of nature, of material, of condition, which re-act upon the mind; and it is with these controlling forces and conditions, and the distinctions which arise out of them, that we are now concerned."

That is, in fact, a correct description of the real scope of the book, much more so than is conveyed in its actual title. The treatment of the connexion of architectural design with structure, or its origin in structure, is in the main what we are all agreed on; it is only marred by some misconceptions into which writers who are not architects are often apt to fall in dealing with the architectural elements of design. It is vexatious to find, in a book written by an eminent artist who will be supposed by many to speak with authority, the renewed repetition of that old and exploded fallacy that in the pointed arches formed by the interlacing of round arches "we have here the actual birth of the pointed arch," and it is the more absurd that, in the course of a book one of the special objects of which is to show that design is based on structure, this perfectly unstructural derivation of the pointed arch should be intruded. If Mr. Crane had studied the history of arched construction in mediæval work, he would have known better than to have committed himself to this fallacy. One can hardly be surprised at this, however, when we find evidence that he takes Ruskin as a guide; one of the most unsafe guides possible in matters of architecture, who knows nothing of construction himself, and substitutes theories and fancies for structural fact. We should say also, that the author seems to underrate the refinement of design in the Doric capital, which he calls "simplicity

itself"; so it is in general appearance, but it is not so simple in design as it appears to the eye. We must take exception also to the insinuation that the Parthenon without its sculpture would be a mere skeleton. Mr. Crane will not find all artists, even those who are not architects, agree with him there; in fact we have heard the opinion expressed by a very eminent painter that even without any of its sculpture it would be the greatest building in the world, if complete in other respects. Apart from these lapses, the chapter is a good popular statement of the progress of design in relation to architectural structure, with one or two original suggestions in it, as for instance, that the preference for vertical and horizontal lines in late Gothic was an indication of the reaction of taste which was to lead to the Renaissance. We observe that he remarks also on the important decorative use which the Romans made of inscriptions, and the manner in which their dignified square capital letters lent themselves to architectural effect. In regard to the illustrations of this chapter, which are numerous and mostly fairly good, when we see what a charming little sketch is given of the Romanesque tower at Canterbury Cathedral, we do not understand why the tower of the Palazzo Vecchio at Florence should be shown in a sketch which is such an absurd travesty of its actual proportions; it looks almost like a joke.

In the chapter on "the utility basis" the effect of practical considerations on some of the simpler forms of architecture is very well treated and illustrated. In the importance attached to some forms of handiwork as the *origines* of such a form as the Greek alternating "honeysuckle" ornament we are by no means disposed to concur; it is ingenious and suggestive, we doubt if it is the real truth. Alternating forms of long and broad ornament have probably another origin, in which the phallic element comes in; this would naturally be passed over in a popular book, but it is passing over what was unquestionably a most important element in pre-civilised ornament, from which the civilised was derived; and as to the particular form of detail taken by the Greek honeysuckle ornament, the presence of foliage forms and the desire to conventionally imitate them would be a sufficient stimulus. We are sceptical as to

* "The Bases of Design." By Walter Crane. London: Geo. Bell & Sons. 1898.

the tassel theory, though we admit the interest of the suggestion and the illustrations by which it is accompanied. Nor can we accept the "curled-up shavings" theory for the origin of the volute forms. It seems to be forgotten that early man had latent in him, among other perceptions, that of geometrical facts of line and space, and the spiral would be one of his first discoveries after the circle, and one which would make an admirable decorative plaything. There is no occasion for the "shavings" theory to account for it; merely experimenting in the first facts of geometry, of lines and spaces, would lead to it naturally—more naturally, to our mind, than the other influence suggested.

The latter portion of the "utility" chapter, dealing with the design of practical objects for every day use, such as lamps, candlesticks, &c., is altogether admirable. In the concluding paragraph the author remarks that "nothing has degraded the form of common things so much as a mistaken love of ornament. The production of things of beauty for ordinary use has declined with the gradual separation of artist and craftsman. Decoration, or ornament, we have been too much accustomed to consider as accidental and unrelated addition to an object, not as an *essential expression and organic part of it*." This, as we have observed over and over again, is the great curse of the trade things made for sale to the general public in this country; bad ornament (so-called) is used to hide and overlay bad construction, the idea of "design" in the true sense of the word never entering into the question at all. The author returns to this point again in the succeeding chapter, "On the Influence of Material and Method," in the excellent remarks on wrought iron work, its capabilities and the manner in which it should be treated. "If we cannot combine a great variety of attractive forms harmoniously, and put them to useful purpose, let us see what we can do with few and simple forms. If we fail at constructing gates of Paradise, let us see if we cannot make a good railing. If we cannot invent a romantic knocker, let us try our hands at an effective scraper. It is much better to do a simple thing well, than a complex or ambitious thing badly; and there is more need in the world for well-designed and beautiful common things than for elaborate exceptional things." In the chapter "On the Influence of Conditions in Design," an important principle is insisted on, which is often forgotten, that in regard to such things as patterns for papers or coverings, the main condition in regard to scale appears to be that we cannot afford to ignore the average human standard.

"Objects intended for human use or service are bound to be of certain fixed or average sizes—seats and couches about eighteen inches from the ground, for instance; ordinary domestic doors not much over 6 ft. high, and 3 ft. 6 in. or 4 ft. wide. The size of casements, again, is strictly related to the power of the hand to open them; while the sizes of all movable objects of use are in like manner strictly governed by the average size, height, and strength of mankind.

Pursuing the influence of such conditions, we find that there are in every direction natural limitations in every department of design; in the first place of scale and position in regard to the eye and hand, in the second place of method and material."

As a general statement this is excellent, but we regret that on applying it immediately afterwards to the question of the design of

book pages, the author repeats Morris's absurd principle that the "unit" of a printed book is the double page as it lies open, and that consequently the inner margins of the pages should be as narrow as possible. This is an utterly wrongheaded notion, which seems to have been taken up in a kind of fashion since Morris enunciated it. The double page would be the unit if we were in the habit of reading every line continuously over both pages; but we do not do so; a book is a collection of pages, and each page is a separate unit. There is a valid reason for making the lower margins large, because there the book is held in the hand, but there is really none for making the outer side margin larger than the inner one; a little larger may be an advantage in appearance, but it is absurd to compress the pages towards the middle opening of the book in the endeavour to treat that as one page which is really two. It is merely one of those "fads" which have been taken up lately, and which are followed as a kind of fashion, with no good reason. There is another point to which we should put a query, in connexion with the subject of wall and ceiling paper designs, which the author seems to treat as if they were on the same grounds, whereas there is a most important difference: the design of a wall paper should have an upward tendency from base to ceiling, it is a rising design; but the essential point in a ceiling paper is that it should be centralised in line, as it has to be considered in all directions. The author shows a ceiling paper design of his own (the upper one on page 123) which is a series of fan-like forms, all growing in the same direction, a kind of design which is manifestly unfit for a ceiling, where the margins are all in the same relation to the centre. The lower one on the page is a true ceiling design; the upper one is not.

In the chapter on "Climatic Influence in Design," in which there is a great deal that is interesting, we rather doubt as to the reason given why highly coloured and varied materials in architecture fall into their place in a sunny climate, and seem staring and unquiet in a duller climate. In the first place, is it the fact; is not a good deal a question of habit? The author is of course perfectly right in remarking, what every one must have noticed, that strong colour in architecture and decoration for the most part follows the sun; where the sun is brightest and hottest, there will be strongest colouring. But he sets up the theory that "broad and full sunlight has a curiously flattening effect upon colour and pattern, and therefore colours and patterns which under a grey sky would look staring, or very strong and striking, under the full sunlight fall into plane, and become subordinated to the dominant pitch of light." This is a new suggestion, but it strikes us as rather far-fetched, or at all events the wrong way of putting it. Sunlight nourishes and brings out strong colour in Nature; tropical insects and flowers are highly coloured; does it not follow naturally that the sunlight should develop the love of colour in man also? In the matter of dress it is notorious that it does; it is not that people find highly coloured costume look quieter under a hot sun, and therefore they can wear it there though it would be obtrusive in a less sunny climate; the very reverse seems to be the case; the brightly coloured

dress looks all the brighter in a hot sun; the brightness of the climate stimulates the love of colour; and it is the same in architecture. Just as people or plants get blanched physically, if deprived of a sufficiency of light, so the taste for colour gets dulled in dull regions, and expands and flourishes under the tropical sun. That we take to be the true philosophy of the subject. Another striking remark of the author's, which we concur in, is that climates which are characterised by constant sunlight and heat favour traditional rather than individual forms of art. If we think of it, we shall see that this is undoubtedly true, and it is a curious fact. We should take it to arise from the greater comfort and indolence with which life is carried on in hot climates; things move more slowly and peacefully, and there is less stimulus to individual exertion, whether of body or mind.

The chapters on Symbolic influence and Graphic influence in design are of much interest. At the commencement of the latter chapter, which deals with the influence on design of various methods of depicting things, the author alludes to the fact that the very early drawings of animals by the cave men seem to have for their object purely the representation of fact, just as a modern artist might make sketches at the Zoological Gardens without any idea of making them parts of a decorative design. "The main difference seems to be that in purely graphic or naturalistic drawing individual characteristics or differences are sought for, while in ornamental or decorative drawing typical forms or correspondences are sought for." That is so, and that is the reason why there is a certain limit to variety in conventionalised foliage, for instance; we set out by eliminating details which would interfere with decorative breadth of effect, and in so doing we lose some of the characteristic points of the living leaf, till we come to find, perhaps, that two leaf forms which are distinct enough in nature come to very much the same thing when conventionalised for decoration. And that is perhaps the real reason why the conventionalised foliage of one age and nation sometimes presents unexpected resemblances to that of another age; the same process has produced the same or a very similar result in each. Mr. Crane suggests on another page that merely graphic illustration seems to belong specially to very primitive times, the idea of reducing forms to decorative use being the offspring of a more cultivated age; but it is probable that some work which we regard as conventionalised was not at all meant to be so by those who executed it. Mr. Crane cites the Ravenna mosaics as an instance of the suitability of that exceedingly simple and conventional style for mosaic, and gives the well-known figure of the Empress Theodora as an example. We have no doubt that the man who did that meant to give as good and as realistic a likeness of Theodora as he could; the manner in which the ornaments are shown supports that idea. We regard it now as conventionalised, and approve it on that ground; but no such idea was in the mind of the man who designed or made it.

Though, as we have said, a great portion of Mr. Crane's book consists of teaching which is rather true than new, he throws lights of his own on various points, and the presence of the large number of illustrations with which

remarks are accompanied gives it an artistic interest quite beyond that which attaches to a mere literary treatise.

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COMPARATIVELY few consumers of London gas are aware of the stringent manner in which the gas supplied by the London gas companies is daily tested on behalf of the general public by official examiners appointed by the London County Council and the Corporation of London. There are twenty different testing stations in various parts of the area under the jurisdiction of the London County Council and within the City boundaries, and at each of these stations the gas is tested daily (days excepted), and the gas examiner has liberty to perform his tests at any hour of the day or night, without giving previous notice to the gas company. The methods by which the gas must be tested and the degree of purity it must possess are determined by a trio of eminent scientific men known as the "Gas Referees." These Gas Referees issue printed instructions from time to time prescribing the manner in which the examiners shall test the gas to ascertain its lighting power, purity, and pressure.

Pressure.—The value of the gas supplied to the companies to the consumer depends very largely upon the amount of gas-pressure he can obtain at the point of ignition for upon the maintenance of a steady efficient pressure depends the utility of the incandescent burner, the gas-fire, the cooking-stove, and large number of other appliances now in general use amongst consumers of all classes. In the early days of gas manufacture, when gas was used for other purposes else save for lighting by means of primitive flat-flame burners, and when the percentage loss of gas by leakage in the mains was more serious than at the present time, the gas-pressure prescribed by Act of Parliament of a minimum of $\frac{1}{16}$ lbs. in. between midnight and sunset, and 1 in. between sunset and midnight was, no doubt, considered sufficient to meet the requirements of that period; but while strenuous efforts have been made from time to time to force the companies to supply gas of a higher illuminating power, little or nothing has been done to obtain the supply of a greater and more uniform pressure. This is probably partly due to the fact that the gas is usually supplied at a pressure much greater than is required by Act of Parliament; but the Act does not enforce a sufficiently high pressure, and what is more important, a sufficiently uniform pressure to meet the requirements of present-day consumers. It is, of course, possible to employ pressure governors, but in practice pressure governors are very apt to get out of order, and many of those in use at the present time are by no means satisfactory, even when in so-called working order. Moreover, it would surely be better to have gas supplied from a central station at a pressure of such uniformity that a pressure governor would not be necessary, than, as at present, to have the pressure liable to such variations that every consumer who wishes to obtain the most satisfactory and economical results from his gas supply must install one or more governors to do so. "Every man his own governor" is not the motto to be adopted in this case, however

well it may sound to men of a socialistic turn of mind. Again, the statutory pressure of $\frac{1}{16}$ lbs. in. between midnight and sunset is absolutely insufficient to give anything approaching to a satisfactory result with the incandescent mantles and many of the gas stoves now so largely used. These standards of pressure were fixed in the days when consumers used little gas beyond what was burned in the evening through flat-flame burners for lighting purposes. But now the average winter consumption of gas in London, and especially within the City of London, between the hours of midnight and sunset is enormous; for the use of gas for restaurant cooking stoves, for gas engines, gas fires, and other appliances used during the day has become so general, that the public can no longer be regarded as night consumers only, and, furthermore, in a city so subject to fogs as London it would be absurd to alter the pressure at sunset—an occurrence which sometimes takes place before even the most observant citizen has been able to obtain evidence of a sunrise. Even if the gas were supplied during the whole day with the present statutory requirement between sunset and midnight of a pressure sufficient to support a one inch column of water, the pressure would not fully meet present day requirements. As a matter of fact, the gas pressure at the street main usually varies during the year, and frequently during the day, from about 1.2 in. to about 3.0 in., and such a pressure being found necessary in practice, the question arises, "Why should the gas companies have a legal right to supply all gas manufactured by them at a pressure below that necessary to meet the common requirements of consumers?"

If the standard pressure were fixed at a minimum of $1\frac{1}{2}$ in. and a maximum of $2\frac{1}{2}$ in., consumers would less frequently have to complain of an insufficient supply of gas, which, as will presently be demonstrated, is ascribed by the average consumer, to the supply of "bad" gas. At present, it is practically impossible to manufacture an incandescent mantle which will yield a constant illuminating power with the gas varying from 1 in. to 3 in. and if a more uniform pressure could be relied upon, there would be less difficulty in manufacturing burners and stoves which would emit the same amount of light or heat at all times of the day and night.

Another annoyance arising from large fluctuations of pressure frequently occurs to consumers who have gas jets in their bedrooms, which they are in the habit of allowing to burn all night at as low a consumption as possible. If the pressure is high when the consumer turns down the jet, the flame is liable to become extinguished altogether when the pressure falls, and a small quantity of unburnt gas passes undetected into the room until the sleeper awakes. A similar nuisance sometimes occurs in greenhouses lighted by gas-stoves. The gas cock is often turned down until the jets are as low as possible, then during the night the pressure drops, and the result is that some of the atmospheric burners "light back," and produce that well-known but most horrible odour arising from the products of the incomplete combustion of gas.

Before leaving the subject of gas-pressure it may be well to refer to a matter which is

often made a source of complaint against the company, but in reality is as much the fault of the consumer as of the company. In the winter time the pressure found at the consumer's gas-bracket often falls very low, and consequently the light obtained is very poor; this may be caused through the pipe connecting the consumer's premises with the street main being too small to allow the amount of gas he requires to pass when the pressure in the street main is not greatly above that required by Act of Parliament, or it may be caused by the fittings within the premises being too small. It is a common matter to find a number of gas-stoves burning, say, 30 cubic feet per hour, placed in a house having fittings originally provided for, say, a dozen flat-flame burners consuming 5 ft. or 6 ft. an hour, these burners being still in use, in addition to the gas fires and stoves. The natural consequence is that a sufficient supply of gas cannot be obtained, and the company is blamed for supplying wretched gas.

Another very frequent trouble, especially in cold weather, is the partial choking of the service-pipes leading from the street to the consumer's premises. The low temperature sometimes causes certain substances of a tarry-like nature to become deposited in the pipe, and the pipe gradually becomes more or less choked; the result is similar to that obtained with a service-pipe of insufficient diameter, and once again the company is anathematised for supplying "bad" gas, although the fault lies with the weather, and a polite note to the company would probably cause them to send their men to blow out the service and put the matter right within twenty-four hours, free of charge.

Lighting Power.—The illuminating power of gas supplied by the London gas companies must be such that when burnt at the rate of five cubic feet per hour through a standard London argand burner, and tested in accordance with the instructions issued by the gas referees, it will give an illuminating power of not less than sixteen standard candles, and it is seldom that the gas falls appreciably below this standard when tested at the official testing stations. But although the gas, as tested at the testing station, is usually above the sixteen candle standard, it must be borne in mind (1) that the testing stations in cold weather are kept constantly heated by artificial means, the temperature seldom being allowed to fall below 60 deg. Fahr., and often rising higher than this, and (2) that the volume of gas used for testing is corrected to a standard temperature of 60 deg. Fahr., and a standard pressure of 30 in. It has been shown by Mr. H. Leicester Greville that the water in a wet meter (wet meters are always used at the testing stations) absorbs a considerable proportion of the light-giving constituents of the gas at a low temperature, and gives them off again as the temperature rises. Now, if gas has been slowly passing through the testing-meter for twenty-four hours, at a certain temperature, and when the examiner arrives to test the gas the temperature of the water in the meter is raised through his lighting gas-burners in the room, or through other causes, the luminosity of the gas tested is likely to be increased by the evolution of hydrocarbons previously absorbed. Moreover, apart from this matter, it is possible that the mere difference in temperature between the gas used by the consumer in

severe weather, and that which has passed through the testing meter, may have some influence upon its luminosity. However this may be, it is certain that when the gas is tested in the ordinary manner, save that the testing station, and consequently the testing-meter, is liable to all the changes of atmospheric temperature, the gas frequently does not give such high illuminating power as is found at the official stations.

With regard to the effect of correcting the volume of gas to a standard temperature and pressure, it is, of course, impracticable to correct consumer's consumption in this way, but the consumer may find it convenient to remember that gas expands when warmed and contracts when cooled, and consequently he can obtain more light and heat from 1,000 cubic feet of gas measured at say, 50° F., than from the same volume of gas measured at say, 68° F. Or to demonstrate it another way, 1,000 cubic feet measured at 50° F., would be registered as about 1,035 cubic feet if the gas were measured at 68° F., assuming that the barometric pressure remained constant. This fact may be made use of when determining the situation of the meter, but it is not advisable to expose the meter to severe cold. So far as gas testing is concerned, it is but reasonable, in view of the effect of temperature upon the volume of the gas and upon the absorption properties of the water in the testing meter, to test the gas at as constant a temperature as practicable, otherwise the company would be obliged to regulate the illuminating power of their gas to the atmospheric temperature likely to obtain at the time and place at which the gas is tested, which would be absurd.

The supposition that the complaints as to "bad" gas are in reality due, as a rule, to insufficient quantity and not to insufficient quality, is confirmed by the recommendation by several men of repute that the present 16-candle standard be lowered to a 14 or 14½-candle standard. The arguments put forward are that 16-candle gas, as most commonly used by consumers, does not give an appreciably greater amount of light than 14-candle gas, and that it would be cheaper for consumers to use the gas obtained from the coal *per se*, which has an illuminating power of 14 to 14½ candles, than to pay the extra cost of enriching this coal-gas by means of oil, cannel coal, or carburetted water gas, to 16-candle power, as is at present done. Having regard to the large use of gas for heating purposes, the question must be largely dependent upon the respective calorific value of the enriched and un-enriched gas.

Purity.—By Act of Parliament the gas must never contain sulphuretted hydrogen, and by the Referee's instructions it must not at the present time contain more than 22 grains of sulphur, nor more than 4 grains of ammonia per 100 c. ft. of gas.

As a rule the sulphur and ammonia are well within these limits, and sulphuretted hydrogen is not present. In the event of a deficiency in illuminating power, purity, or pressure being reported by any of the gas examiners, the company usually appeal to the Chief Gas Examiner, who is an impartial person appointed by the Board of Trade, and whose decision, when appealed to, is final. The company are required to pay a penalty for every failure to comply with the requirements of the various Acts of Parliament,

unless the Chief Gas Examiner decides that the Gas Examiner did not follow the referee's instructions when making his examination of the gas, or that the deficiency was occasioned by some unavoidable cause or accident, in which case no forfeiture is incurred.

NOTES.

St. Bartholomew's Priory and the Cripplegate Fire. It is stated that the inhabitants of Cripplegate Ward have

formulated a scheme for widening Jewin-street, and driving a new road (through St. Botolph Without and St. Bartholomew-the-Great parishes) to West Smithfield, as a precaution against another great fire. If their present proposal is carried out it will involve, we understand, the demolition of the fine gateway, of transitional date, forming one entrance into Bartholomew Close, and partially imbedded in two houses at the south-east corner of the market area. It has been said that the gateway was a west door into the Priory church, but that can hardly be the case. There can be little doubt that it was an entrance, or postern-gate, into the close and cloisters on the south side of the church. For, whilst it is in a direct line with the south aisle of the nave, it stands too far from the nave, which extended about 100 ft. from the present west wall of the church; moreover, it is too high and too large for a doorway at the end of an aisle. As to the proposed street, the line of a road from opposite the west end of Jewin-street to the corner of West Smithfield would pass through Queen-square and the two inner blocks of Bartholomew Close. Thus it would pass over the sites, from east to west, of the Priory Lesser Close and the Prior's stables, the Mulberry Gardens (now traversed by Middlesex-passages), the Dormitory (City of London Union Offices), the Refectory (conjectured position), and the Cloisters as plotted in a plan of the Priory buildings which we published on May 8, 1886, and believe to be correct in its main lines. On that plan, it may be observed, the gate in question is 60 ft. distant from the west end of the nave. The nave site is now the western churchyard, being "the void ground 87 ft. in length and 60 in breadth, next adjoining to the west side of the church, to be taken for a churchyard," specified in a deed of sale by which, on May 19 1544, the King sells for 1,064*l.* 11*s.* 3*d.* to Sir Richard Rich all the Priory buildings within the close, but reserves "the church within the Great Close to be a parish church for ever." The gate is no part of the church, therefore, but that does not alter its architectural and historical value. We do not imagine that its destruction, to secure an arbitrarily-chosen line of street, will be permitted.

Children's Sight.

MR. BRUDENELL CARTER, the well-known oculist, delivered a lecture at the Society of Arts last week on the subject of children's sight, based to some extent on interesting investigations which he had made in regard to the sight of children in the elementary schools in London. We are not now about to discuss the great proportion of those who have imperfect sight, but we desire to emphasise what Mr. Carter says in regard to the effect of children's surroundings on eyesight. We have more than once pointed out that in the great public schools sufficient attention is not

paid to the lighting of class-rooms; they are badly lighted in many respects, doing permanent harm to the pupils' sight. Fortunately in the elementary schools most of the work is done by daylight, but there can be no question that every elementary school should be as perfectly lighted as possible. In their homes children frequently live under still worse conditions, and there are hundreds of girls in London houses who pursue their studies in the worst light in the house. Unfortunately ground space in London is now so valuable that the inside of London houses tend to grow darker, and so more injurious to the sight.

THE intended demolition of the Paris fortifications between the Seine and the Porte de Pantin revives attention to a scheme proposed, some twenty years ago, by an engineer, for the formation of a canal fed by the river Marne between Neuilly-Plaisance, on the north-east of Paris, and Epinay-sur-Seine, on the north-west. The scheme would have the double advantage of preventing the inundations of the Seine and Marne, which cause every year a great deal of damage to river-side property, and of forming to the eastward of Paris (the side most menaced in case of war) a kind of natural fortification much more practical value than the existing wall.

A Berlin Competition. The result of a competition for designs for an elevated electric railway in Berlin has been announced. Messrs. Möhring, of Berlin, Schumacher, of Friedenau, and Schellerau, of Schöneberg, have taken the first prize for their design for the station in Potsdamerstrasse. Curiously enough, the same gentlemen have been awarded the second prize for their design for the viaduct in Bülowstrasse, while Messrs. Bernhard & Stahn have obtained the third prize for their design for the same viaduct. Not having seen the conditions, it is difficult for us to understand what principles the assessors followed in awarding prizes for portions of the work, the system does not seem wholly satisfactory. It is, however, pleasant to note that the authors of the seven unsuccessful designs receive fair treatment. On application to the proper quarter they will obtain, not on their own drawings, but also copies of the assessors' reports and fac-similes of the successful designs. The last item is especially worthy of imitation in this country.

Primitive Ireland. On the 24th ult., Mr. W. L. Brose lectured at the London Institution on the subject "Primitive Ireland." The lecturer interpreted the adjective in the most catholic sense. Limelight views were shown on the screen of modern peasants and their dwellings; of the lovely sculptured cross at Kesh (which is hardly "primitive"); of the oratory at Gallerus and others of its type; of the Clare Island castle, said to have belonged to the Connaught queen whom people insist on calling "Grace O'Malley" (it is pity Mr. Brose did not show the very remarkable little church on the same island); of the forts on the Aran Islands, which, owing to their stupendous size and the complete mystery that surrounds their origin, are the most impressive works of man remaining in the British Islands—notwithstanding the

erocious treatment they have received at the hands of restorers; and of many other buildings. A large audience, to most of whom the subject was obviously entirely new, followed the lecturer with interest.

Polyphase transmission of Power. **ALTHOUGH** polyphase transmission of power has been for several years in successful operation abroad yet it is only now beginning to be adopted in England. The two papers read before the Institution of Civil Engineers last week both treated of this important subject. The first paper was by Mr. Lewellyn B. Atkinson and gave a *résumé* of the theory, design, and working of alternating current motors. His division of the many types of polyphase motors into various classes was good and will be helpful to engineers by reminding them of the different principles on which apparently similar machines work. Numerous starting devices were also described, and the numerous diagrams shown were a great help in understanding their action. Useful curves were given showing the relative weights of continuous-current, single phase, two phase, and three phase motors. Three phase motors are simpler in design and mechanically stronger than continuous current motors, there is a large field for them in factories in this country. Messrs. Ganz & Co. have shown some of their motors working under water. The other paper was by Mr. H. F. Parshall, and was on the Dublin Electric Tramway. As the large three phase transmission plant for this tramway was the first in this country, Mr. Parshall is to be congratulated on its success. His paper was interesting from a commercial point of view, as it shows how traffic can be developed by an improved service. The traffic on this line was formerly worked by three unprofitable horse lines which were finally sold for about 14,000*l.* The value of the present property, although it has not a rough connexion to the centre of Dublin, is 300,000*l.*, and its revenues are consistent with this sum.

In Dr. St. George Mivart's Report to the Local Government Board on an outbreak of enteric fever at King's Lynn, the outbreak is attributed to the faulty character of the public water service, which appears to be of the worst possible description, although the sanitary (or insanitary) conditions in the town are bad enough. The head-waters of the stream from which Lynn gets its supply are derived from springs that flow out of the base of the chalk, the water in which formation is held up by the underlying impermeable Gault. The water of these springs is in itself of satisfactory quality, but it is unfortunately polluted at or near to its sources. Two of the three principal sets of springs rise amidst foul surroundings. The northern set at Grimstone rise directly from beneath the churchyard; another set rise upon and around the slope whereon stands the farmstead known as Well Hall, where the springs seem to be looked on as the fit receptacle for all the refuse of the farmyard. One building is directly over a spring, the water of which may be seen oozing out from under the outer wall. As if these sources of pollution were not sufficient, Dr. Mivart found an immense heap of refuse and farm manure close to the

edge of the stream. "The inhabitants of two cottages, situated just below this point, obtain water by 'dipping' from the stream, and the enormous quantity of mussel shells thrown upon the very edge of the stream immediately adjacent to this 'dipping' place is significant of the indifference of the population of the district to the purity of their water supply." It appears that local medical opinion long since utterly condemned the water, yet a large and influential section of the inhabitants of Lynn maintain, or at any rate have maintained until now, that this water, manifestly polluted though it be, is of excellent quality; a statement which can only be made, one must conclude, for reasons connected with local politics.

THE paper read by Mr. Byng to the Institution of Electrical Engineers last week on the manufacture of lamps and other apparatus for 200-volt circuits is very interesting reading for those consumers who have the misfortune to be supplied with electricity at 200 volts. Mr. Byng, as a manufacturer, gives a fair statement of the case, and it may well give pause for reflection to the many consulting engineers who have advised corporations to adopt this pressure. The results of a series of life and efficiency tests made by Mr. Robertson show that the ordinary high voltage lamps, with unflashed filaments, after 600 hours' use, only give 40 per cent. of their rated candle power, and their efficiency has diminished 35 per cent. This drop in the efficiency gives some of the lamps a long life, as the temperature of the filament is too low. This may explain how they are sometimes said to give satisfaction, as some consumers are satisfied with a long-life lamp, and pay little heed to its efficiency. Another drawback to high voltage lamps is that 10 per cent. of them short circuit as soon as they are put up. This difficulty, Mr. Byng pointed out, could be got over by making the holders for the lamps larger, but this would detract from their appearance. He dwelt upon the dangers of using cut-outs with china bases on 200-volt circuits, as the china base is easily volatilised and not only contributes towards the maintenance of the arc, but is sometimes ruptured explosively, and may set fire to inflammable surroundings. An excellent cut-out was shown that obviated this difficulty. It is, however, more expensive than the ordinary ones. Mr. Byng concluded by pointing out that 200-volt lamps must necessarily always be more expensive than 100-volt lamps. In the subsequent discussion none of the statements in the paper were seriously questioned. Mr. Raworth, speaking as a consumer, stated that Mr. Byng had greatly underrated the case against a 200-volt supply.

THE second of this series of Carpenters' Hall Lectures, given on Monday evening by Professor T. Roger Smith, who took for his subject, "Some Notable Buildings in France." The chairman, Dr. A. Robertson, of King's College, in his introductory remarks, stated that "the French had always been the pioneers of Gothic architecture," but the lecturer himself, in describing and criticising the French buildings of the mediæval period, did not appear inclined to endorse the view, now so often put forward, of the innate superiority of French over English Gothic work. Many

excellent lantern illustrations were shown in the course of the lecture, arranged in geographical sequence, taking the form of a tour through the principal cities of France. A wide area, in point of time, was covered by these views, as they ranged from the Roman aqueduct called the Pont du Gard, down to the new Opera House at Paris; the majority, however, referred to the great cathedrals of the Middle Ages. The lecturer attributed the more grandiose and richer character of so many of the cathedrals of France, compared with those of this country, to the greater wealth available in the former country at the time when they were being built; but he considered that the best English examples excelled the French buildings in having a finer skyline and a more dignified effect, the latter characteristic being more especially remarkable when contrasting specimens of the late Gothic work of the two countries. In showing some views of Mont St. Michel, he alluded to Mr. Pennell's account of "the most picturesque place in the world," and claimed for Mont St. Michel that it really had a better right to the title. Attention was also drawn to military, domestic, and civic architecture, some characteristic examples of each being shown on the screen, including the restored castle of Pierrefonds, the palace of the Tuileries and the old Hôtel de Ville of Paris, both destroyed by the Communists, as well as the new Hôtel de Ville, built to replace the latter, which the lecturer considered to be inferior, in external aspect, to its predecessor. A large audience followed the lecture with evident interest and attentiveness. Next Monday Mr. Lewis F. Day will lecture on "Wood Carving—its Design and Practice."

THIS church has just been re-opened, after undergoing a thorough renovation by Sir A. W. Blomfield, at a cost of about 1,700*l.* The church was built in 1765-7 from the designs of George Dance, the younger, its predecessor having fallen into a ruinous condition. Of the former church there is a view by W. H. Toms and R. West (1740), reproduced in our issue of April 25, 1885. Toms's description of the church, which we printed at the same time, is taken from Hatton's "New View," 1708. The church adjoins the old city wall, and the vestry, it is said, was built on a bastion. The portion of the wall eastwards from the church forms a garden wall to some houses in New Broad-street; another piece, about 150 ft. long, was found, close to the church, in 1885, during the construction of Blomfield House, at the corner of Blomfield-street (formerly Broker's-row) on the site of the old Portuguese synagogue. The upper course of the wall, of ragstone, 2 ft. 6 in. deep, lay nearly level with the then existing ground. All-Hallows churchyard was laid out in the spring of 1895 by the Metropolitan Public Gardens Association as a public recreation ground.

THE water-colour exhibition of the Dudley Gallery Art Society contains a splendid example of an architectural water-colour, Signor Giampietri's "Stylobate of the Temple of Antoninus and Faustina" (42); he sends also "The Sauvetorilia Forum, Rome" (78). Another capital architectural subject, a mere

All-Hallows on the Wall.

Dudley Gallery Exhibition.

sketch but thoroughly artistic, is Miss Margaret Bernard's "Houses of Parliament" (132). The same artist contributes what is certainly the finest drawing in the room, the broadly-handled scene entitled "Haymaking, Woodleaze, Dorset" (140). Among the more highly-finished drawings that are worth attention are Mr. Geo. Marks's "Haytime" (243) and "A Surrey Landscape" (255), and Mr. Newton Benett's "Warborough" (267) and "The Cathedral Green, Wells" (273).

THE exhibition of drawings by Miss Kate Greenaway, at the Society of Fine Arts, seems to indicate that this lady's real power lies in the little figures of children with which she has decorated so many books, coloured in a flat and half conventional style. The larger water-colours and drawings in the collection are not of the best order as examples of water-colour, and many of the figures are very defective in drawing; in the larger sketches of figures walking, in fact, the knee seems to come anywhere, higher or lower, as if by chance. Look at "Come Along," for instance (114), and some others. The best of the larger drawings is "Two at a Stile" (27), which has good decorative lines and is a very charming invention in every way. Among the little child figures for which the artist is famous are some in her very best style, such as Nos. 1, 4 and 6, the latter a group of dancing children lent by Mr. Ruskin, which is perfectly charming. But Miss Greenaway's success lies within this field, and she will be wise to restrict herself to it.

SOME young Russian artists living in Paris have combined together to form an exhibition of their work, which is of some interest. Among the paintings is a fine portrait by M. Alexandrovitch, sea pieces and landscapes by M. Belacowsky and M. Chabanian, studies by MM. Loewe, Magkoff, and Tkatchenko, and a painting by M. Louchnikoff—"Le Soir." Of the sculptures the statuettes and busts by MM. Bernstamm and Aronson are among the most noticeable.

WE are officially informed that Mr. J. T. Micklethwaite has been appointed architect to Westminster Abbey, in place of the late Mr. Pearson.

THE FLORENTINE RENAISSANCE.* BY PROFESSOR AITCHISON, R.A.

As we owe the discovery of the methods of building used by the Romans and Byzantines to M. Auguste Choisy, so do we owe to Baron Henry de Geymüller the right attribution to their authors of many of the buildings of the Renaissance. Baron de Geymüller has the gift of tongues, and writes equally well in German, French, Italian, and English. With indefatigable industry he has visited every known work of Bramante, and looked through the sketches of most of the Renaissance architects in the various libraries of Europe, and by comparing the handwriting as well as the character of the design, he has restored to their authors the credit for many buildings attributed to others. Fra Giocondo (born 1433, died 1513), the learned ecclesiastic who edited two editions of Vitruvius and gave us the first

illustrated one in 1511, as well as his "Corpus Inscriptionum," dedicated to Lorenzo du Medici, and eventually incorporated in the works of Maffei, Gori, and Muratori, was well known for his learning and scholarship, as well as for his studies of ancient Roman work and for his great abilities as an engineer. He was employed by the Emperor Maximilian at Verona, 1494-8, was sent for by Louis XII. of France to build bridges over the Seine, and he executed still more important engineering works for the Republic of Venice. From the difficulty of persons in the present day conceiving the possibility of that general capacity for all sorts of skill, knowledge, and invention, that so distinguished the artists of the Renaissance, it has been the fashion to deprive Fra Giocondo of all credit as an æsthetic architect; but Baron de Geymüller, by going through the drawings preserved in the various libraries of Europe, has been able to affirm the capacity of Fra Giocondo as an æsthetic architect, and, in spite of the adverse criticism of the late Léon Palustre, has shown that in all probability he was the architect of the Palazzo del Consiglio at Verona (see lithograph). This most charming and delightful palace has been the delight of all architects visiting Verona. The late Dr. Middleton discovered in the walls of Verona the remains of a double window erected in the days of Gaudentius (reign 260 to 268 A.D.), from which Fra Giocondo took his windows for the Palazzo del Consiglio. In the present day the simple appropriation of some anterior design would not be considered conducive to the credit of an architect, but when the desire of the public and the architects was to re-create Roman architecture, the use of a piece of Roman work was highly conducive to their fame. Vasari tells us how Giuliano da San Gallo repeated a peculiar Roman Ionic capital in the new buildings he was then erecting for the monks, that was dug up in the gardens of the monastery, and also attributed great merit to Baldassare Peruzzi for adapting a Roman cornice he found, to a palace that he was then erecting. We, however, are merely concerned with the beauty of the new constructions, and are perfectly indifferent as to whether the striking features were taken from Roman work or were the outcome of the architect's inspiration.

The Palazzo del Consiglio at Verona looks as if it had been erected in two pieces; at any rate, in the middle of it there is a pilaster that goes right up the building, dividing it into two halves. These two halves of the palace are precisely similar, and consist, on the ground floor, of three columns on each side of the central pilaster. These columns stand on pedestals, between which there are balustrades, and support a very light and elegant arcade, which in its turn supports a narrow entablature; above this entablature is a low continuous podium. In the middle of each of these halves on the first floor there is a pilaster, and in the centre of each space between the pilasters is a window, consisting of a double supported on columns, with semicircular arches, and surrounded by dressings, consisting of pilasters supporting an entablature with a segmental pediment above them. Above the crowning member of the top cornice of the building, and over each pilaster, are pedestals supporting statues. I believe the panels of the first floor, between the windows and the pilasters, are painted, and are either altogether modern, or restorations of the remains that could be traced of ancient painted panels. The two upper pilasters between the central and angle ones are supported on ornamental corbels, after the fashion of capitals, coming down into the spandrels of the arches, while lower in each spandrel is a small shield. This portico on the ground floor is entered by two short flights of steps between the first and second column to the right and left of the central pilaster, and the height of the steps is made up by a sort of continuous base below the pedestals of the columns and pilasters. The panels of all the pilasters are carved with arabesques, and in the alternate segmental pediments are mermaids supporting a shield, and lions or chimeras, also supporting a shield between them. The whole building is extremely light, and of most graceful proportions, and the solidity of the first floor forcibly contrasts with the eight large openings below. On the left hand angle pedestal of the first floor there is a bas-relief of a friar, who has in his hand Pliny's Epistles, some of which Fra Giocondo discovered in Paris. That bas-relief, therefore, confirms the belief that he was the architect. Fra Giocondo was one of

the architects of St. Peter's after the death of Bramante.

Raphael became the great friend of Bramante, as they both were from Urbino. It was through Bramante's influence that he was induced to come to Rome and was introduced to the Pope; it was from Bramante that he learned the elements of construction, for his early works show that he was well acquainted with architectural forms and with perspective, and it was at Bramante's intercession with the Pope that he was appointed head architect to St. Peter's after Bramante's death.

The principal architectural works of Raphael (1483-1520) as an architect, before he became the head architect at St. Peter's, are the church of St. Eligio of the Goldsmiths at Rome, the Palazzo Pandolfini at Florence, and the Palazzo Farnese at Rome. This last is commonly attributed to Baldassare Peruzzi, but there seem excellent reasons for believing that Peruzzi had not begun to study architecture when this palace was built, although Vasari attributes the design to him. But the marvel is that Raphael should have so mastered construction as to be recommended by Bramante to succeed him, for from his age it was only reasonable to suppose he would live to complete the dome.

I give a view of Raphael's Palace, said to be designed by Bramante (see lithograph).

Baldassare Peruzzi (1481-1536), like Raphael, was ultimately a disciple of Bramante. That he was a man of very extraordinary powers there can be no doubt; that he was a distinguished painter no one can deny. We have a picture by him in the National Gallery, but whether he was so great an architect as has of late been asserted is doubtful. He is entitled to great credit, not only for the admirable planning of the two Massimi Palaces at Rome, but for making a successful façade to the great one, which was in the Via de San Paolo Leone, which is curved (see lithograph); but though the front and its parts are well proportioned, and the mouldings and treatment are delicate, I should hardly class it with the Basilica at Vicenza, the Communal Palace at Brescia, the Library of St. Mark's, or the Farnese Palace. His principal merit there was that he did not use columns or pilasters on his front, but used columns only where they were wanted. If we may judge from his works he seems to have thought that this pilastering and columning of fronts was not a very sensible procedure, and to have left out columns and pilasters in the bulk of his works; and that is all the more reason why we may believe that the pilastered fronts of the Farnesina is Raphael's and not Peruzzi's. At the Massimi Palace he only used columns to support the entablature of the open porch.

The Palazzo Albergati at Bologna has no pilasters or columns on its front; perhaps the most charming front for simplicity is the front of his Casa Pollini at Siena, with its battered basement wall, its row of seven corniced windows to the Piano Nobile with the great blank spaces below and above them, and with seven square windows in the attic, and widely projecting eaves. That this was a matter of judgment or taste is undoubted, for his design for the organ case at Siena is a most elaborate composition. When Mr. Hill published his book of organ fronts he was rather disgusted with me for saying that Peruzzi's organ case was worth all the rest in the book.

Great credit has been claimed for Peruzzi for showing Sansovino the way to make attic windows in the frieze of the crowning entablature, but I think he might have well been spared that particular commendation. Sebastian Serlio has produced Peruzzi's plan for St. Peter's in his book ("Venice, 1544," Book 3, page 38), though Baron de Geymüller says that it was but a copy of a sketch by Bramante. I hope to give you an account of St. Peter's next year. I give the Palazzo Ossoli attributed to Peruzzi (see lithograph), which has pilasters on the two upper floors, and, in my opinion, does not add to his fame.

Peruzzi was one of the unlucky men; he was taken by some of the Constable Bourbon's soldiers, after the sack of Rome, 1527, and from his dignified mien was supposed to be a great ecclesiastic, and was tortured to get a large ransom from him; when they found he was only a painter, they made him paint Bourbon's portrait, and I suppose let him escape; on the road to Siena he was robbed, and had to enter the town in his shirt. He made, too, the mistake of fancying that, because he was learned and skilful, his merits would be appreciated,

* Being the fifth Royal Academy lecture on Architecture this Session. Delivered on Monday afternoon, February 14.

and so died very poor, but his merits were at last appreciated after his death, for he was entered in the Pantheon, where Raphael was also buried.

I have not attempted in these lectures to give a sketch of the work of each architect of the Renaissance, but as a rule only to speak of those buildings that have struck me as being peculiarly beautiful, or as having such strong character that they greatly impressed one in looking at them, and some slight sketch of the architect, and even this is, I fear, a little too much; but I shall continue this method to the end, perhaps adding a few who, from their celebrity in other ways are important to be considered when they took upon themselves the duties of architects. There are two of the great architects who have left works that have arrested our attention either by the grandeur and dignity of their buildings or by the particular charm of their designs. The one was Antonio Piccone, called Antonio da San Gallo, because he was sent for by his uncle Giuliano to Rome and became his pupil. To him we owe the great Farnese Palace. Curiously enough John Addington Symonds left his name out in his list of architects, probably mistaking him for his uncle, the elder Antonio. The other great architect was Jacopo Tatti, called Sansovino, who built the great library in the Piazzetta at Venice.

Bramante, Raphael, Giuliano da San Gallo, and Michelangelo were all architects in chief of St. Peter's, while Fra Giocondo, Peruzzi, and Antonio da San Gallo the younger were assistant architects. The subsequent architects to St. Peter's, and possibly some less well-known men who were employed there, I shall postpone until I am able to give some account of the building of St. Peter's, for although we may not consider it very important as a work of art, it is not only the great Roman Catholic cathedral of modern times, but is also one of the largest buildings in the world. Size and bulk are always important features in architecture even as a visual fine art, but the difficulties of enormous buildings from a constructive point of view are tremendous, so that the architect always deserves great praise, even if his building be not very charming to look at, it stands.

Michelangelo, Palladio, and Longhena I shall speak about in my last lecture.

Antonio da San Gallo the younger had the advantage of acting as draughtsman to Bramante when, from gout and palsy, he could no longer draw, and as Bramante found him to be a most invaluable assistant, he probably hid one of his knowledge from Antonio. In my next lecture I shall give an account of the Farnese Palace.

Jacopo Tatti, 1477-1570, was called Sansovino because he was a pupil of Andrea Contucci da Fontaine. Sansovino, called so from his native place and took the nickname of his master instead of his own family name. He became, thanks to the care bestowed on him by Andrea, and his friendship with Andrea del Sarto, a very distinguished sculptor. He was taken to Rome by Giuliano da San Gallo, who was then architect to Pope Julius II., and here he became acquainted with Bramante, and admired some of his designs. Pietro Perugino, who was painting a ceiling for Pope Julius, having remarked the talent of Sansovino, got him to prepare wax models for his use, and possibly through him Jacopo Tatti became acquainted with the great artists of the time—Luca Signorelli, Pinturicchio, and Cesare Cesariano; but becoming ill from overwork he had to leave Rome and go to Florence, where he soon got cured, and became celebrated at Florence for the draperies of his sculpture. Leo X., on visiting Florence was much struck with some of Sansovino's sculpture in the temporary decorations prepared for his triumphal entry, and gave him an order to do some in marble, and sent him to Pietrasanta to get the marble, but from the delay in the carriage the Pope had left Florence before his return. Jacopo followed him, but found that Michelangelo had got all the sculpture to do for him, and Sansovino may be said to have been thrown on private practice, and here he began to study architecture, and he was chosen by the Florentines in Rome to be the architect to their church, dedicated to St. John the Baptist. Meeting with an accident at the church he went back to Florence, leaving the care of the foundations of the church to Antonio da San Gallo. In 1527, the sack of Rome by the Constable Bourbon took place, and Sansovino took refuge in Venice. The cupolas of St. Mark's

required repair, and Sansovino having repaired them to the satisfaction of the Doge, the Senate, convinced of his ability, made Jacopo protomaster of the procurators of St. Mark's, the highest office conferred by the Signory on its architects and engineers. He seems to have shown as much ability in keeping their accounts and managing the laying out of their property in Venice, as he had done in sculpture; in fact, he is said to have increased their revenues by 2,000 ducats a year. He got from them an order to build the new Library, which is said to have caused a notable change in the mode of building at Venice. The vaulting of this Library having tumbled down, Jacopo was imprisoned and fined a thousand ducats; but the Signory, finding that it was not his fault, let him out of prison, and returned him 900 of the ducats he had paid. He subsequently built a great many palaces, and put the celebrated loggia round the bottom of the Campanile, and executed the two colossal figures of Neptune and Mars at the top of the staircase into the Ducal Palace, which from them is called the Giant's Staircase. Sansovino died at the age of 93 in Venice, admired and respected, and in the full possession of all his faculties, not even it is said requiring spectacles.

The great Library of St. Mark's is well known, and has been admired by every visitor to Venice. It consists of two stories of columns, Doric on the ground floor and Ionic on the first floor, with arcades between them with figures in the spandrels, and an attic whose windows are introduced into the deep frieze. It is a most charming and seductive building, very much in the style of Palladio's Basilica at Vicenza, and though much more graceful and ornate, misses the classic severity and imposing grandeur of Palladio's work.

Sansovino also, as already observed, built the Loggia at the foot of the great Campanile in the Piazza. A few steps up from the Piazza take you to an elaborate bronze gate, on either side of which is the balustrade which protects persons walking on the terrace. The front consists of three arches, forming entrances to the rooms within. It has Composite columns on either side of the doorways, leaving space for a niche between each pair (see lithograph). Above the entablature is a blank attic with narrow piers above the columns. Between each pair of piers is a bas-relief. The bas-relief and the statues in the niches, especially the Mercury, have been very much admired. The whole of the Loggia is crowned by another balustrade. Vansanzio, the Dutch architect of the Medici Palace at Rome, probably took that hint from the Loggia and covered the palace with panels in bas-relief. The Giant's Staircase of the Ducal Palace, at the top of which are Sansovino's gigantic statues of Neptune and Mars, is said to have been designed by Riccio, or Rizzi, the architect to this part of the Palace, and to the front next the narrow canal which is spanned by the Bridge of Sighs. The architecture of the piece at the top of this staircase consists of the large central archway and two smaller ones on either side. Over the centre of the main archway is the Marzocco, or winged lion of Venice, with a book under its paw. The frieze of the entablature is enriched with roundels of marble, with highly ornamented frames, and between these are festoons of fruit with a patera in the hollow space left by the festoon. On either side of the lion are charming panels of cupids supporting shields, with a Doge's cap on the top of each of them as a crest. The arches spring from piers and in front of each pair is a deep pilaster. Between the outer arch which starts from the pilaster and the inner one that starts from the pier, there is a very rich band of ornament. Over the pilaster is a narrow paneled pier, filled with trophies of armour and spoils, the spandrel of the arch beneath the entablature is ornamented with floral ornament. The rest of this side in the court is very much simpler in form, the ornament consists mostly of medallions hung up with ribbons between the columned windows, said to have been designed by one of the Bergamaschi. The side of the Ducal Palace next the canal consists of narrow arcades treated after the manner of the front next the Giant's Staircase, but much less elaborate. On each story balconies jut out here and there, with pierced geometrical panels supported on cantilevers that run through the frieze of the entablature below. On account of the narrowness of the canal and the great height of the building it is very difficult to get a proper

view of it, unless you can get into the houses opposite.

The architecture of Riccio is most severely criticised by Mr. Ruskin, who thinks the architecture of not much better character than the architect, who was not celebrated for his uprightness. I also give you a view of The Cicciporci Palace, Rome, said to be by Giulio Romano (see lithograph).

THE ARCHITECTURAL ASSOCIATION: LEAD WORK.

AN ordinary meeting of this Association was held on Friday evening last week in the Meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, Mr. Hampden W. Pratt, President, in the chair.

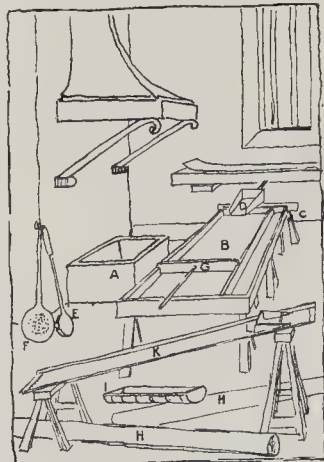
The minutes of the last meeting having been read and confirmed, Messrs. E. G. G. Bax and C. Gilbertson, were elected members of the Association.

Mr. G. B. Carvill proposed a vote of thanks to Mr. Sidney R. J. Smith, for allowing the members to visit, on the 5th ult, five houses in Park-lane, and for his hospitality on that occasion. This having been agreed to,

The Chairman said he should like to call the attention of the members to a special meeting of the Discussion Section to be held on March 9, when Mr. P. J. Waldram, of the Institution of Junior Engineers, and Mr. Sydney Beale would open a discussion on "The Desirability of a Closer Relationship between the Engineer and the Architect." The meeting would be open to all members of the Association, and would commence at 7.30 p.m.

Mr. F. W. Troup then read the following paper on "Lead Work, Plain and Decorative," the reading of which was interspersed by practical demonstrations of casting, tinning, &c.:-

"I propose to introduce to you the subject of to-night's discussion by quoting from a most interesting paper by Burges. I think no



Plumbing Plant of the Seventeenth Century
(Traced from a print in "Principes de l'Architecture," Paris, 1690.)

The following are the references to the lettering:-

- "A. Fosse à fondre le plomb.
- B. Moule pour le table de plomb.
- C. Tréteau pour porter le poêle.
- D. Grand Foêle de fer à verser le plomb.
- E. Cuiller à puiser.
- F. Cuiller percée.
- G. Rable.
- H. Rondin pour faire les tuyaux.
- I. Polastre (?).
- K. Moule couverte de toile pour les petites tables de plomb.
- L. Rable."

apology will be required for doing so as the paper is buried in the 'Ecclesiologist' of December, 1856, and a footnote explains that it was previously published in the pages of the Builder but had been revised by the author for the 'Ecclesiologist.' The title is 'Ornamental Leadwork,' but many of the remarks and methods described bear quite as much upon plain roofing work:-

'At the present time perhaps there is no metal considered less suited to the purposes of the fine

arts than the subject of the present notice. However, the great artists of the middle ages thought differently. Their architecture was (and always must be) eminently of figures and subjects, and accordingly they compelled even lead to bear its part in the great poem of Christian art. They cast it into ornaments, they hammered it into figures, and with the help of tin, they executed imperishable paintings, which, when placed beyond the reach of man, have far more successfully resisted the ravages of time than the crumbling sculpture or the worm-eaten dossier.

At the same time, it must be confessed that the intrinsic value of the material has but too often been the cause of its destruction, and although, as citizens, we can scarcely blame the French Government for melting even the historical lead into bullets for the defence of the country, yet, as artists, we must ever deplore a necessity which has left us vestiges so few that our curiosity is rather stimulated than our iniquities gratified. I can, therefore, only pretend to put before you a very short notice of the various objects which our forefathers produced in lead and tin—beginning with those belonging to the Church—the great art patroness of the Middle Ages.

Roofs.

Let us imagine the architect had got up the carpentry of his roof, and then proceed to ascertain how he went on to cover it; and here it may be premised that his roof is a very different one to those designed by the late ingenious Mr. Peter Nicholson. However, the only points of difference with which we have to do at present are, first of all, that there is no ridgeboard, the rafters meeting one another at top whilst they are kept in a straight line by means of a ridge-bolt; and secondly, the second point of difference is that the king-posts stand up above the roof for a considerable distance.

In the thirteenth and early part of the fourteenth century, however, when continuous [lead] ridges were used, composed of isolated members as at Amiens or Exeter, the ends of all the king posts, except that over the apex, were cut off, as they would not be wanted for the support of the ridge.

Now the architect, in those days as in these, had the choice of tiles, slates, or lead to cover his roof with; but then, as now, the latter was by far the most costly and the more esteemed. Still even tiles and slates under his hands became beautiful. The tiles were coloured with variously coloured enamels as at Mantel, while the slates had their edges cut into divers shapes, and were disposed in patterns according to their tints. When lead was used it was generally very thick. That at Canterbury, I am told by Mr. Austin, runs about 12 lb. to the foot. The roof being boarded, the lead was laid on much in the same manner as at the present day, except that the sheets were somewhat narrower (about 2 ft. in between the rolls), and that these latter were formed by turning over the sides of the sheets, without the assistance of the wooden rolls used by the modern plumber. If there was no ridge the rolls were continued over the top of the roof and a little way down the opposite side so as to allow the sheets to lie well together. If, however, there was a ridge, the method was rather different. And here it may be observed that, during the Middle Ages, everything susceptible of having a ridge applied to it had one. This was the case even with the miniature enamelled "Bahuts de Limoges," and still more so with regard to the large silver chasses for reliques, some of the crests of which are most beautiful though of course treated according to the different nature of the material employed. The tiled roofs had tile crests, several of which had been discovered at Great Malvern, but the slate roofs were treated in a similar manner to the lead ones, to which latter we now return. We have hitherto supposed the roof to be boarded and covered with lead, with the rolls continued over the apex. Now, as these rolls would interfere with the ridge, they must be suppressed and accordingly the sheets of lead are made to finish at some little distance (one foot or more) from the top of the roof, where they are turned in and nailed to under side of boarding.

The apex was not generally covered by two boards butting up against each other; on the contrary, it was thought better to cut a sort of trough out of the solid, and to apply it reversed to the top of the rafters so as to form as solid a foundation for the ridge. Irons in the form of an inverted Y were nailed to this inverted trough at proper intervals, and then the piece of lead forming the head-ridge, having had corresponding holes cut in the middle, was slipped over them. The next thing was to cast the various members of the cresting, to solder them together (for they could only be cast in halves), to slip them over the projecting irons, and lastly, to solder their lower extremities to the leaden ridge piece. When nails were used the head-ridge was covered with a square piece of lead soldered at one end; and as this solder extends some way down, and is marked with the iron, at a little distance, the whole looks like a coat of arms with a chevron.

Amiens affords an excellent example of the very simplest form of ridge. Unfortunately there is nothing to tell the date by, as the Beaufort-ly have been mutilated on one of those occasions when the French nation, wearied with kings, expelled the dynasty and defaced its badges. Most probably it is a sixteenth-century restoration of the thirteenth-

century ridge; for the spire was burnt down, and with it part of the roof, in 1527, and when restored shortly after, a very different form of ridge was in vogue. At Rheims the principal member of the cresting was two feet high and one foot six inches wide (French measure), that at Exeter is about one foot high by ten inches wide. I am afraid that even the oldest part of the Exeter ridge must be considered as a sixteenth-century restoration of an earlier one. Mr. Cornish, who conducts the works of this cathedral, has presented one of the ornaments to the Architectural Museum, where it is now to be seen; it is very badly cast, and ill-adapted for its position as the upper part is heavier than the lower.

I must now go for authorities to the work of M. de la Querrière, who has given me several specimens of ridges, but, unfortunately, has said nothing about their construction, which, however, was all upon the same principle; and we now see why the king posts are carried up, for to them is nailed at some distance above the apex of the roof a bar of iron loosely covered with lead. The ridge, which is always of an open and delicate pattern, is cast in two halves as usual (except when it is very light and open), is then soldered at bottom to the ridge piece, and at the top to the lead pipe covering the iron bar.

Where slates were used, another decoration to the ridge piece was the application of long-pointed strips of lead alternately pointed and curved. These were cast and soldered on to its lower extremity; they occur at the Chateau de Meillant, Seine Inférieure, at the house of Jacques Coeur and at the Hotel Cujas Bourges.

Crochets.

If they are rather large, each crochet has a thin piece of iron covered with lead (copper will do) alone, one end of which is soldered to the lead pipe, and the other to the extremity of the crochet. And, while on this subject, it may be as well to show how the largest crochets, such as those on the spire at Amiens, which are 1 ft. 6 in. long, are managed. An iron about 12 in. square, has its end split into two parts, so that it resembles the letter T; the split part is nailed on to a single rafter, and the other, which juts out, is covered with lead; on the upper surface is soldered a piece of very thick lead, to which some of the upper leaves of the crochet are soldered; the end leaves next the rafter and the stalk are, of course, fixed to the lead covering of spire as usual. Another way of treating the medium crochets was to make the iron in the form of an L, fixed in a similar manner; the projecting part, covered with lead as usual, is soldered to the inside of the back of the crochet, in the body of which two holes are bored to let out the wet. The crochets running up the sides of the dormers are usually executed in this manner.

Figures.

A very favourite finish for a roof, especially at the east end, was a figure of the patron saint, beaten out in lead. The following extract, given by M. de Laborde, from the accounts of St. Maclou, Rouen, gives us some information upon the subject. "I saw in the name of the artist, '1514. To John Pothyn, sculptor for having carved a prophet in walnut wood, to serve as a mould and pattern for the works in lead.' All then, the plumber had to do was to hammer sheets of lead over the wood statue until they fitted to the shape. These were then cut off, and soldered together again with an iron frame, and the whole was then covered with lead, and the figure was made of lead. At Paris, where several of these figures have lately been executed for the Ste. Chapelle and elsewhere, cast-iron moulds are substituted for those in wood, as will be seen by the following notice, which I owe to the kindness of M. Gerente Paris.

"You were correct in thinking the angel at the chevet of the Ste. Chapelle is made of lead. Wood and lead are the only two materials used in the fleche; for all the flat surfaces cast lead is employed, but for the ornaments and figures milled lead is hammered on to cast iron moulds. In a few instances lead castings are met with, such as the sun of the arcades. There is no zinc used at all. The moulds for the figures are made, of course, in several pieces, the different parts of the figure having been beaten up upon them, are joined together soldered inside, and the joinings outside made with the hammer. As to the decoration, there is no fluting at the Ste. Chapelle, but merely gilding, which is done with two coats of oil yellow tint varnish, and over it gold in leaf."

There is one difference between the ancient and modern leaden figures, which, I think, deserves to be noticed. The latter are soldered together like a modern work in bronze, i.e., the whole of the surface is homogeneous. Now, as far as I could ascertain, the figures on the spire at Amiens, the former (i.e., the ancient ones), although soldered in parts, are, nevertheless, in two or three pieces, the joint probably being made by means of a lap, as in roofs, and the places of junction concealed by means of the folds of the drapery. In fact, in a similar manner to the ancient bronze statues at Herculaneum.

The same method was carried out in detached pieces of carpentry covered with lead, such as pinnacles, where one (if not two) of the edges is made to lap, never by solder. It would appear to have

been a principle to lay the lead as loose as possible, and to be very sparing in the employment of solder. It still remains to be proved which is the better of these two ways of constructing figures in lead. That of the moderns is certainly the strongest. The only fear would be the chance of its cracking for want of the necessary play for expansion.

This fleche is truly a *chef d'œuvre*, whether we consider it with regard to its carpentry or its lead work. Among the many beautiful wooden spires still left us in France this is beyond all comparison the best. Every decoration possible to lavish upon it in the way of lead work has been bestowed, and that with no sparing hand. Statuary, foliage, gilding, tinning, painting, all are there, and well did it deserve its title of the golden steeple.

I will now quote from another source, and in this instance we again have recourse to methods practised in France. 'The Principles of Architecture' by Felibien, published in Paris in 1690, gives a succinct description of all the crafts relating to building, with interesting plates showing the workshops and tools used and describing their purpose (see cut, page 227).

Book 1, Chapter xvi. Of Leadwork.

'Whilst in ordinary houses and small buildings we can do entirely without lead or employ it very sparingly, in the greater part of large edifices, there we require it not only for the ridges of the roofs, for gutters and down pipes, but it is also frequently used, as for example in the Louvre, to lay in sheets between the large stones in place of mortar. Lead, therefore, is largely used in building, and the more so since it can be worked with such facility. The greater part of what we get here comes from England in large ingots called "saumons," weighing 400 lbs. or thereby. Germany also sends us some lead which is in ingots or square "saumons" of 120 lbs. weight, but the latter is dry and less sweet than that from England.

As lead is so readily melted it is easy to shape it into any required form by casting in moulds of copper, plaster or other material.

But as the lead used in buildings is for the most part required in sheets, the following description explains how plumbers prepare those sheets.

A pit is built with sandstones and "terre franche," and this is rendered all round inside with plaster. At the bottom is fixed a little smelting-pot in order to receive remainder of the melted lead, and above of its being removed more readily afterwards. The pit is raised so that the bottom of the pot is level with the floor. In order to found lead the pit is first heated with charcoal to prevent the melting lead from sticking to the sides, and to help in fusing the metal. When sufficiently hot, we lead and charcoal are heated in a bell-mell and allowed to melt.

Close to the founding pit should be the head of the casting-table to allow of the lead being conveniently and quickly transferred from the pit. This table is sometimes 18 ft. long and 3 ft. or 4 ft. wide, as may be required. It is made of great planks of timber, well jointed and bound at the ends with iron hoops, forming a frame all round 2 in. or 3 in. thick. This frame rises an inch or two above the surface of the sand which it encloses, and which covers the top of the table. The sand is prepared by moistening and mixing it thoroughly with a piece of wood, called, working the sand. Finally, it is smoothed with a plane of copper to render its surface level, and to remove all the irregularities.

When the metal is melted, a great iron pan of triangular figure with flat bottom, square end, and sides tapering from back to front is brought forward and heated over the pit. It is then laid with its front edge resting on one end of the table, and the back part on a tressel rather lower than the end of the table. Into this iron pan is emptied, with a large ladle, the contents of the founding pit, charcoal, and altogether sometimes as much as fifteen or sixteen hundred pounds weight, or even more.

The charcoal is now removed and the lead well strained with a perforated ladle, after which the handle of the iron pan is raised, and the melted lead is shot over the surface of the table. It is pushed forward with a strike the full width of the table, and 4 in. deep, by about an inch thick.

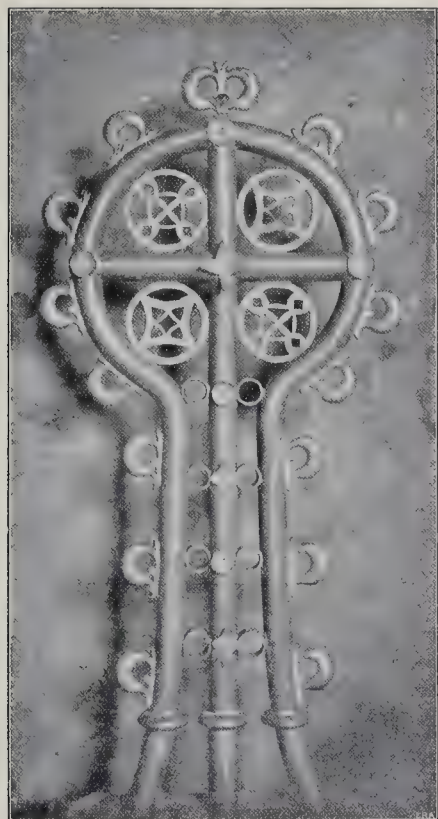
The two ends of the strike run on the rails forming the sides or frame of the table, where the strike is notched to allow of the lower edge dipping down into the frame just far enough to leave, as it sweeps over the surface of the lead, the required thickness of sheet.

When the sheet is thus cast and cooled, the edges and ends are trimmed by cutting off a strip with the draw-knife, leaving the whole sheet clean and square.

There is another way of running sheets of lead when they are required in enormous quantities. In this case the table has a rail on one side only, and is made as before of a number of large wooden boards. In place of covering it with sand, a piece of stuff or woollen cloth is tightly stretched over the surface, and above this a sheet of linen or fine calico. The frame is not placed level, but has a good slope, one tressel being higher than the other. The strike consists of three pieces of wood fastened together. The centre or cross-piece is 7 in. or 8 in. deep, and of whatever the width the sheet of lead has to be. To each end of it and at right angles are fixed the



Lead Panel designed by Mr. E. S. Prior.



Cross on Gable of Church in Canning Town (in unfinished state) made by Mr. Dodds.*

The ornamental parts of this cross were made at the School of Arts and Crafts in order to show how to make small articles in a plumber-made lead mould, which I showed and explained at the Association lecture. The frame-work of the cross is an ordinary 2-in. lead pipe with an iron rod inside to carry weight. The leaden base not shown in the photograph.—F. W. T.

side pieces, which are 12 in. to 14 in. long, and taper from the same depth as the cross-piece to nothing. This strike is placed on the upper end of the table with the cross-piece towards the low end and the tapered ends of the sides towards the top.

When the lead is melted a morsel of paper is dipped into it to test whether it is hot enough to run and yet not so hot as to burn the linen covering the table. If the paper catches fire and burns it is too hot, but if it does not scorch and yellow a little it is not yet hot enough to run properly. In placing the strike in position a card is placed under it to form a bottom, and receive the molten lead which is poured into the strike from a ladle. The card serves to protect the linen from scorching during the preparation. When all is ready the two men, stationed one on each side of the table, slide the strike down over the linen, allowing it to move slowly, or pulling it rapidly, according as they wish to leave a thick or thin sheet of lead behind the strike.

The thin and even sheets of lead made by this method are those used, as already mentioned, in the jointing of the masonry at the Louvre and other great buildings.

The great question of milled versus cast lead I am not prepared to solve for you, but I may offer one or two remarks bearing on the subject. We are told by the advocates of cast sheet lead that it turns to a silvery grey or white in course of time, whereas milled lead always turns black on the surface. I believe there is not much doubt about the latter part of the statement, and certainly the beautiful patina on the surface of many old roofs of cast sheet-lead go in support of the first part of the theory. But I think it wants some further investigation and proof to show that cast sheet-lead under modern conditions—which of course includes the metal as well as the atmospheric conditions—will also oxidize to a silver grey or white patina. The lead used on the roofs of St. Paul's and the buildings attached to it are, and I believe always have been, covered with cast lead. From these roofs we might therefore be able to judge conclusively, as there is a constant repairing being carried out in which freshly cast lead is used. But I gathered from Mr. Penrose and his plumber some years ago that the stock of old lead was adhered to and simply re-cast, and in the stock I distinctly remember seeing piled up in the crypts fragments of very old lead waterpipes and even several examples of Roman pipes. An examination therefore of the condition of the lead on these roofs would throw light on only one half of the question, namely, how the old metal stands and how the surface "goes" when oxidizing under the modern London atmosphere. I might here read you a letter from Mr. Crickmay to Mr. Thackeray Turner, which is interesting and gives useful hints to both architects and plumbers. It was quoted by Mr. Turner in a short paper written for the Art Workers Guild, and this at Mr. Lethaby's behest was kindly given over to the lead-working class at the Central School of Arts and Crafts.

Nethbury Church, Dorset.

'What I told you in reference to the lead covering of this roof was that the old cast lead roof had been on for 100 years, and was perfectly sound, but that a piece of roof there, which had been covered with 7 lb. milled lead had only been on for twenty-five years, and it was eaten full of holes almost like a sieve.

This arose partly, if not entirely, from the fact that it was an oak roof under, and the acid from the oak acted upon the lead and caused a deposit of white lead which destroyed the milled lead.

But apart from this, it is the fact that the sun acts readily on milled lead, causing it to go up in ridges, get very thin in the hollows, and soon develop cracks. The sun does not so readily act upon cast lead, consequently does not get thin in places.

I invariably use cast lead for lining sinks in which hot water is to be used, and they last for a very long time, but if milled lead is used they rise up in ridges and crack in three or four years.

(Signed) G. R. CRICKMAY.

Note also the following scientific testimony:—

'Green oak-wood from the quantity of acetic acid which it contains, should not be used in contact with lead for building purposes.' 'The vapours of acetic acid corrode it rapidly.'—

Miller's *Inorganic Chemistry*.

As soon however as you come to ornamented lead work there is no longer any question as to whether cast or milled lead is best. With the latter you are confined to bossing, whereas in casting your sheet it is not only possible but very easy to imprint patterns or letters or ornament in the sand bed, and it is still possible to boss or beat up the cast sheet to what extent you please after the casting is complete. Tin-

ning and engraving can be done equally well on either kind of lead, but in the cast sheet all your work, however wrought, gains by the superior texture of your ground surface.

I made some mention just now of the difference in the metals themselves, between old and modern lead. The chief difference consists in the greater purity of modern lead. Silver is frequently found in conjunction with lead ores and formerly this was but partially extracted. By modern perfected methods it is profitable to extract the silver if the lead contains only a few ounces to the ton. Whether this absence of silver in modern pure lead has any effect upon the colour to which the surface oxidizes or 'weathers,' as some have held, I am unable to say, but I think there is no question that the old lead was somewhat harder and more self-supporting in exposed positions from its slight admixture of silver and traces of other metals (tin, iron, copper, and sometimes antimony and manganese), alloys being nearly always harder than the principal metal in the composition. In this connexion it is interesting to note Burges's remarks upon window leads (I quote from the paper referred to already). 'Now, the lead for this purpose was cast, not milled; it was also much narrower than the modern, but contained, if anything, more metal. The consequences are that much of it is good up to the present time, while our flat, broad milled window lead having its grain broken by the milling, and presenting a very thin and very broad surface to the air, becomes rapidly deteriorated. At Beauvais, I saw some lead which was probably put up at the end of last century, quite in a state of oxidation, and at Tournay, where the whole immense windows of the choir have been filled with stained glass, at no very distant period a very large expense will have to be undergone to fresh lead the whole, as nothing better than the common cottage window lead has been employed.' Note here that thin lead soon oxidizes and absolutely perishes altogether. This may seem strange when we remember how everlasting lead sometimes seems to be. The reason is very simple, and should not be overlooked. A fresh clean surface of lead tarnishes very rapidly when exposed to the atmosphere, owing to the formation of a thin, closely adhering film of oxide. This film protects the metal from further change, excepting that itself in course of many years becomes (in the case of cast lead) a fine patina of appreciable thickness. Where the lead itself is of considerable thickness, the loss of strength from this oxidation of the surface is inappreciable, but when the lead has been rolled out so thin that the film of oxidised metal bears a considerable proportion to the whole thickness of the metal, it is no longer able to serve its purpose, and tears or drops away as strain or wear and tear come upon it.

Now a word as to the laying and working of lead. Whether milled or cast, it matters not, there is room for much improvement on modern methods. You have only to look at the exhibits sent in by the students of the Polytechnic schools for the prizes to see that the ideal aimed at is all wrong. The results are often wonderful and extremely praiseworthy if only they were of any use. But the working of the lead as at present taught seems to me to be labour misapplied. What practical value is to be had from a three-branched soil-pipe beaten out of one single sheet of milled lead? The dexterity and patience required to do such work is astounding, and so is the patience and perseverance required to build a full-rigged model ship inside a glass bottle—a seventh wonder to be seen in exhibitions and shop windows. I have, of course, taken an extreme example from what I have seen in the work of the students, but all the rest is 'tarned with the same stick.' Mechanical precision in lead work is not only wrong from its being labour misapplied, but it renders the life of the metal shorter, its cost greater, often prohibitive, and certainly does no good to the woodwork it covers. Plumbers with their 5 lbs. or 6 lbs. milled lead nowadays often beat and dress the lead over the wood like a coat of paint. The result is that frequently the lead cannot expand and contract freely, as it ought, to prevent tearing and buckling; and the wood under—well, the closer you cover wood the more chance of dry-rot, and if there is any acid remaining in the wood, the more certain is it to attack the underside of the lead. What I should like to see would be a closer following after old

methods which are invariably simpler and more straightforward. My friend Mr. Dodds used to say, he admired the old gutters which seemed to be laid by cutting out a piece of lead the right shape and walking over it once or twice on your stocking soles. That was all. Nothing more is wanted. The young plumber of the present day is taught to dress and fit the sheet hard down into every angle and beat it close over the drip. For result you get the lead, as often as not, hard fixed at each end, and under a hot sun it must buckle, under a frosty sky, tear. And at each drip the water is drawn up by suction or capillary attraction between the two sheets of lead, and if there be any snow in the gutter, as like as not the water gets up to the woodwork. By the old method all this is left loose and easily fitting, one sheet sliding over the other whether in expansion or contraction. There is no possibility of capillary attraction taking place at the drips or elsewhere, for the lead goes gently rounding over the drip, leaving a clear space between it and the turn up of the underneath sheet.

Nor can I see any special merit in beating things up out of a single sheet of lead when the same object can be attained more directly, more simply, and more rapidly by the help of solder. There are limits to everything, and soldering in plumber work may be overdone, but soldering seems to me to be the legitimate treatment for lead. The joining of two pieces of lead together by soldering is as pre-eminently suitable to the material as welding is for wrought iron, or brazing for copper. Such problems as to beat up a rain-water head from one sheet of milled lead ought not to be set, except as a subject for students' practice—a kind of study in lead working—and even then it is dangerous, as likely to result in a mere display of manual dexterity and skill, and to develop into such methods of laying and dressing lead as I have described and condemned already.

Now one word as to solder, tinning, and decoration of lead. I will quote again both from M. Felibien and Burges's paper. The following remarks in the old French book on solder and tin are interesting:—

'The solder used by plumbers for ordinary work is made by melting together 2 lbs. of lead with 1 lb. of tin. Its quality is known by pouring some from a ladle on the floor or on a table, when, if it be good, it will form what are called "partridge's eyes"—little clear shining spots.

Tin also comes from England in great ingots weighing 400 lbs. Some are called "rose" ingots, others "ring" on account of the different brands. The "rose" is the mark of England; the "ring" the mark of Rouen, where the metal is examined on arrival. That which comes first from the melting pot when tin is being smelted is more refined and sweeter, and on this better quality the inspectors stamp simply a ring; and according to the different quality they put one, two, or three crooks called "griffes"; the worse the quality, the more "griffes" are put until in the very brittle and bad samples they break a corner off at some point of the ingot. There are also other marks totally different put on by merchants and makers, but good judges of the metal do not let these marks weigh in estimating the quality of such samples.

When plumbers wish to tin sheets of lead, they have a tinning furnace full of hot charcoal, on each side of which a man stands holding up and heating the sheets of lead. Leaves of tin foil are laid over these, and as the sheets get hot and the tin melts, the tinning is accomplished by rubbing and spreading it over the surface with tow and resin.

Now we come to Burges:—

Polychromy.

'The architect having thus finished his roof, which we may observe was again calculated last for four or five centuries, not simply ninety-nine years, neither more nor less—he thought that as so much pains and expense had been taken to make it strong and beautiful, it was worth while to go a little further, and give it all the advantages of colour.

How was this to be carried out? Direct polychromy could only be used in the more protected parts; and oil gilding, although in some situations very effective, hardly contrasts sufficiently with the lead to make it desirable to employ it in large quantities, to say nothing of the excessive expense.

The problem was solved by the use of tin, whose imperishable brilliancy contrasted well with the dullness of the oxidised lead, and which, being applied by fire, became part and parcel of the latter metal, and could neither be washed off by the rain like the gilding, or cracked by the sun like the oil painting.

The process of tinning is thus performed: the lead being first of all covered with a tolerably thick coating of lamp black and size, and the pattern traced with a point; all that part of the surface not to be tinned is removed with a shave hook, so as to leave it clean and bright; a little sweet oil is then

rubbed over, and the solder applied and then spread with a copper bit in the usual manner.

The next thing, of course, was to fix the lead in the position it was designed to occupy; for the tinning was done in the workshops, although occasionally it was performed when the lead had been up many years. Thus the spire of N.D. at Chalons-sur-Marne was probably constructed in the fourteenth century, but we must refer the tinning to at least a century later. In this case the process of tinning was much more tedious, as the work was only able to apply so much tin as the end of his axe-bit would take up; and accordingly we find the work in the instance under consideration very coarse and rough, contrasting strongly with that of the dormer window at the east end of the same church. All the leadwork of the roof was more or less susceptible of this decoration, but it was generally confined to the more ornate parts, such as the bases of the girouettes, and the dormer window, but more especially to the ridge pieces, which latter contrasted well with the long dark body of the roof which was left plain. Almost all the principal mediæval edifices of France present more or less of this decorative treatment, and the same traces of it are to be found in England, although I think Durand, who executes the leadwork for the Saint-Chapelle, informed me that he had heard of some existing in England—he thought at Shrewsbury.

It has before been observed, that the recessed pediments of the dormers, their sides—when pierced by the wind, their outlines were unalterable, and received polychromatic decorations. The colours were not applied directly upon the lead, but upon a tinned surface, the lines alone being left to oxidize. The oil colours used upon the tinning were transparent, so that they might receive the full benefit of the brilliancy underneath: these paintings were made to restore, in their outline, the original effect of the subject on the cheek of the dormer at Chalons-sur-Marne to have original bases coloured, although only the tinning and a few traces of the mordant of the gilding remain. This supposition is rendered more likely from the relation of M. Barbar, an old inhabitant of the town, who told me that when a boy, at the beginning of the last century, he lived in the church, and that one night a piece of lead fell down from the roof in the yard, the which piece was enriched with a variety of positive colours, such as red, green, &c. The plumber to the hospital at Beaune also informs me that traces of colour were found on the girouettes, when under the process of restoration. According to his account the colours were thus attributed: the bases were painted in chevrons red (and tin); the stems had a ribbon pattern; the rondels were blue, and the ornaments gilt. I present the only perfect specimen of polychromatic decoration upon lead I can refer to in the instance of the second stage of the Amiens flèche.

In conclusion, I would recommend the architect who wish to study the possibilities of lead, the plumber's art historically to avail themselves of Mr. Lethaby's excellent little work, where they will find a most interesting chronicle of the best work to be found in this country in all periods, besides invaluable suggestions and guidance for the worker in lead. I have in this paper referred very slightly to ancient examples, although, as many of you know, would be easy to discourse for hours on the multitude of beautiful examples of coffins, font-cisterns, pipes and pipe-heads, spires, roof-ridges, finials, &c., which remain all over the country and abroad. These form an attractive array for any student, and, as every town has examples, at any rate of the later development of the plumber's art, an interesting study might be made of the varying types in different localities. This, however, is not my object, and I would rather warn you against 'cribbing' or producing old examples. What I wish to show you is the simplicity of the old methods of work, by what simple ways, almost child's play, the ends were attained. And, again, from the very ease with which ornament can be applied or wrought on this lead you must beware of the opposite pitfall and not imagine that you have reached the goal when you have covered your material with beautiful ornament.

Learn the possibilities of your material before you attempt to design in it. You architect cannot possibly study thoroughly all the materials you have to deal with. But it is always possible to study one or two, and to do so will let in a flood of light upon all the others. This knowledge will make you very modest indeed in attempting to design with blacklead, white paper, and a T square. You have only to try *once* by designing first on paper and then attempting yourself to carry out that design in actuality to learn what a poisonous and deadly thing it is for a craftsman to have to follow line for line 'the architect's design.' All freedom is gone; what would have been a quaint twist, or an amusing play of colour and shade, is sacrificed and killed in order to follow absolutely the black and white skeleton

I repeat, you have only to try it once in material you like to find the truth of what

then once you have learned something about your material, paper and pencil are very ill, but you will use them in a more tentative way, knowing that many things occur to render it change a necessity in order to get the result from what you have in hand; the thing is but a means to an end.

I have already quoted so fully and freely in paper that I cannot do better than finish quoting from Mr. Lethaby's 'Leadwork,' and referred to:—

Every design must ever be founded on a consideration of the exact purpose to be led by the proposed object, of how it will be its purpose best, and show perfect suitability to the end in view when made in this or that material by easy means. This, not the thing of a material into forms which have before been used, is the true ground of type, and this to a certain extent is enough out any ornamentation. Ornament is another matter: it has no justification in itself, it can only justify itself in being useful."

The Chairman said that they were very indebted to Mr. Troup for the practical demonstrations of some of the methods of using lead as well as for his interesting remarks. There was no better method of illustrating a paper than Mr. Troup's.

Mr. W. H. Seth-Smith, in proposing a vote of thanks to the lecturer, said that since Mr. H. Lethaby's excellent little manual on work had been written greater interest in lead-work had been shown. In many old houses in the country a great deal of ornamental lead-work had been used, not only in houses but in the garden. Mr. Troup had shown them some simple ways of using lead-work ornamentally at the present time, and he had made many of them think of some beautiful ways of treating rain-water heads, spouts, crockets, &c. They would feel stimulated to encourage their clients to use more ornamental decorative work of the kind, notwithstanding the greater cost. They were very much indebted to Mr. Troup for giving them the result of his long experience, as well as for practical demonstrations.

Mr. Matt. Garbutt, in seconding the vote of thanks, said that one of the many revivals which they had witnessed recently was in regard to the artistic treatment of lead. He had been rather surprised to find that in London some beautiful samples of old lead work could be found, and he instanced the case of Queen Anne in Queen's-square, Bloomsbury, which was of lead, though he did not know whether cast or hammered. Mr. Troup had stated that cast lead used in sinks did not buckle so much under heat as did lead. Perhaps it was because some of the old ornamented specimens of lead were cast, they did not appear to sag so much under heat of the sun as did modern work, and he came across vases in gardens which were very little distorted by the heat of the summer.

As to colour on lead, the grey patina, possibly due to the presence of a small amount of silver, was very striking. It was very well known that bronzes were used, especially by the Japanese, which produced an extremely grey patina, due to the presence of copper, and a very slight variation in the composition of an alloy almost always produced a difference in the colour of the patina. The fine, rich, purples that sometimes saw, depended upon the presence of a small quantity of gold in the alloy. It was quite new to him that there had been any polychromy on lead. There had been a controversy about coloured marble in architecture, and it was very interesting to find that a material like lead had been treated as a ground for coloured work. But apparently the lead had to receive a coating of tin before it could take the colour. He did not agree with the lecturer that soldering lead together was equivalent to welding iron. When iron was soldered the jointing material was exactly the same as the materials joined, and they became practically one; whereas in soldering the jointing material was different from the materials joined, and the joint was a point of weakness, the solder melted at a lower temperature than the other materials. He also thought that generally a soldered joint was stiffer than the lead it joined, and that would produce cracks.

Mr. H. Longden said that there used to be a good deal of lead mining in Derbyshire, but he was afraid the ore was now worked out. The Romans worked these lead mines, and there was a very interesting discovery made there within the last year or two of a pig of lead with the Roman mark upon it, which had been traced back to the second century. He believed that what Mr. Troup had said was true as to the silver in the lead making it better. Of course, in the modern process the silver was extracted, and he believed the silver in the lead had something to do with the excellence of the surface of ancient work. At St. Paul's the old lead was melted over and over again, though no doubt a little fresh lead was put in each time, and he believed that was the way that people who melted metals were accustomed to work. In regard to the application of colour to lead, he believed that he had seen some drawings by Mr. Troup, of St. John's College, Oxford, with some old coloured lead work shown. This was a beautiful example of what could be done.

Mr. A. T. Bolton said that it was very interesting to notice how the plumber's trade, which used to be treated as the fag end of the specification, with which nobody took any trouble from the point of view of design, had now come to the fore again. The artistic part of the specification used to end with the joinery, and very few people were aware of the possibilities of lead. He remembered some years ago a pupil in an architect's office once saying that he had once seen some fine lead cisterns in London, and the remark being looked upon as absurd. But it was perfectly true, as down in some of the old areas in Bloomsbury there were to be seen some fine cisterns with, in some cases, Jacobean patterns on them, cast in relief. Of course, most people were alive to the fact that beautiful rain-water heads could be made with lead, but the difficulty was the expense, for there were very few jobs on which 7l. or 8l. for a model in wood could be spent, especially as some people seemed to think that all the rain-water heads of the building ought to be different, which, in his opinion, was a mistake. Something might be done in lead if people would be content with the same pattern, especially for all heads at one level. They could get an excellent lead rain-water head of stock pattern for 50s., which would cost 7l. or 8l. if the pattern had to be specially made. He thought architects might do more in the way of keeping to lead pipes; for iron pipes were horrible things, besides which they did not last so long as lead pipes. Lead pipes would last over a century and iron pipes but a few years, to say nothing of the constant painting they required. Architects should always insist upon having cast lead pipes, rather than those made by hydraulic pressure, which the plumber always wanted to bring on the job. He believed that Mr. Bodley was fond of using lead for stars and badges on ceilings, and the effect was very much bolder than simple painting. Another use of lead was to form an inlay, as was done in the risers of the marble steps of the Giant's staircase at Venice. He was very glad that Mr. Troup had quoted so much from Burges, because it showed what an extraordinary knowledge Burges had. There was hardly any point of a practical or artistic character that Burges did not appear to know, and it had frequently been said that had Viollet-le-Duc not written his Dictionary of Architecture, Burges would have done so. It was interesting to try to find out how Burges came by so great a knowledge. Apparently he was in the habit of measuring everything that he came across, and it was in so doing that he acquired his extraordinary insight into the artistic and practical capacities of materials. This must be a hint to them all, for it was by measuring and drawing work that their attention was directed to points which would otherwise escape their attention. He (the speaker) might mention that he had been to Chalons, but having only taken the usual look round he had not seen that coloured lead work to which Mr. Troup had referred. It was a very good thing for an architect to have a hobby like Mr. Troup's, for by following it up they could not fail to learn not only all about the special art which they were studying, but the knowledge which they thus gained of that particular one would also give them an insight into all the others. The probability, moreover, was that in devoting time to the thorough study of such an art an architect far from losing time

would in reality learn more about architecture as a whole.

The Chairman, in putting the vote of thanks, said that it had always been a question with him as to the proper treatment of lead—whether it should be cast or hammered—though he had always an idea that the proper treatment was to beat rather than to cast it; but after what Mr. Troup had shown them, he thought that a great deal could be done by casting. The practice of beating up and hammering lead out of one sheet did not seem to be such a great gain as was usually supposed. The use of solder was perfectly legitimate, although, as had been pointed out by Mr. Garbutt, it was not the same thing as welding iron. He was very much interested in seeing the example of coloured lead that Mr. Troup exhibited, for he had previously never seen colour applied to lead. It was the sort of thing one would not have thought possible, or at all events permanent, and he was still inclined to doubt whether it was possible for it to be seen at any distance. In a lead font near the eye a satisfactory treatment of colour might be possible. Some of the best examples of ornamental lead work were to be found in fonts and in cisterns. There were some very excellent cisterns in lead to be found, but he had never been able to determine whether they were cast or not. In regard to the general use of lead, he felt a difficulty in distinguishing as to quality. They could tell the thickness and weight of sheet lead, but unless they were good judges of the material they could not tell what its quality was. He hoped that the quality of the material was not deteriorating, for its possibilities were as great now as ever. In the present day some very poor specimens of lead pipes were to be seen.

The vote of thanks having been put and carried by acclamation,

Mr. Troup said, in reply, that as to the statue in Queen's-square, he should say that it was certainly cast. In such a material it was always possible to cast the figure in parts and solder them on, as it was easier to join the parts of a lead statue than of a bronze one. But as a rule they were cast exactly as bronze statues were cast. He was much interested to hear the remarks about the colouring of the different patinas in bronze. It certainly showed that silver might have to do with the beautiful colouring of the old work. Then as to tinning being put on before colour could be applied, that was not always so, for, in the case of St. John's College, Oxford, the treatment was different, and the colour was put on direct. He usually regarded a joint as an opportunity for strengthening an article, for the solder was harder than the lead. In certain situations it might be dangerous to use a solder joint on account of the strain put upon the joint by the expansion of the metal, but in ordinary cases the solder joint gave strength to the article. The process of lead-burning or autogenous soldering, as it was sometimes called, was admirable in every way. It required, however, more skill and more elaborate apparatus than ordinary soldering. When well done a burned joint was theoretically perfect, the two sheets being no longer two, but one. In regard to the making of lead rain-water heads the great advantage was that they could cast the lead in the flat, which was a very simple process. It was only in the later rain-water heads that they got the projecting mouldings, which looked like other material really, and they were never cast; they were nearly always beaten out on a wooden block. The simplest way of making a rain-water head, whether ornamental or plain, was to build it up in sheets and solder them together. It was not surprising that Mr. Bolton was unable to see the colour on the spire at Chalons, because it was almost invisible now. As to inlaying, it was very easily accomplished. They need only cut out the design as deep as the lead would permit and then fill it in with the different colours in mastic. Another method of tinning ornament on lead was to paste on a piece of brown paper the shape of the groundwork, tinning in the spaces that were cut away, exactly as one would stencil on a wall. In regard to cisterns, nearly all the fronts were cast, and some of them in very high relief; but he had never come across any that were bossed to any great extent, they were nearly all moulded in sand. Milled sheet-lead was often very much inferior to good pig-lead, and for casting sheet-lead it was very necessary to have good lead.

The Chairman announced that the next meeting would be held on March 11, when Mr. Hippolyte J. Blanc would read a paper on "The Ecclesiastical Architecture of the Thirteenth and Fourteenth Centuries." The meeting then terminated.

DRAWINGS FOR THE ROYAL ACADEMY.

As usual, we shall be glad to receive and deliver at the Royal Academy all drawings intended for the Architectural Room which are sent to us in time to be photographed for publication before sending in.

The last day for receiving drawings at the Academy is Monday, March 28, and we can receive none at this office later than 12 noon on Saturday, March 26.

Every drawing must have two labels giving the title of the work and the name and address of the author, one affixed to the back of the drawing, and the other attached by a string so as to hang over in front of the drawing, and must be accompanied by a letter to the Secretary of the Royal Academy, giving also the title of the work and the name and address of the author. If more works than one are sent they must be numbered, and referred to by the corresponding numbers in the letter to the Secretary.

Gilt frames only are admissible at the Royal Academy.

We cannot provide labels for drawings which are sent without them.

Illustrations.

TWO VENETIAN RENAISSANCE DOORWAYS.

THESE two doorways, the one from the Scuola di San Rocco, the other from the Church of San Giobbe, Venice, illustrate some of the characteristics of the earlier and the later Renaissance as it showed itself in Venice. Scarcely fifty years separate the two, but there is a great difference in their types. In the San Giobbe doorway, about 1470, there is a playful and semi-medieval treatment of classic elements, and the small statues on the apex and at the springing of the pediment have a decidedly Middle-Age feeling about them. One may notice also the characteristic treatment of the cornice of the pediment, with its crowning member turned round to make a circular ornament at each side.

In the San Rocco doorway, dating about 1517 or so, the "school" classic has predominated, and we have the Roman order on its pedestal, and the much more formal and academic treatment of the details; though it shows, in a certain sense, an increase of architectural dignity.

EXAMPLES OF RENAISSANCE ARCHITECTURE.

THE illustrations of Italian Renaissance buildings contained in these two plates are given as illustrations to Professor Aitchison's fifth Royal Academy lecture. They are all referred to in the course of the lecture, and therefore need not be specially dwelt on here.

We have not been able to illustrate Professor Aitchison's previous lectures, as we were not able to have the illustrations in advance of the lectures. We shall give some further ones in our next issue.

"BENCAIRN," KIRKCUDBRIGHTSHIRE.

THIS house has been designed for a special position on very high ground on a shooting property of the same name in Kirkcudbrightshire. The rock to be excavated on the site is considered suitable for the general building with a rough cast finish, and Dumfriesshire red stone dressings. The slates specified are Tiberwaite green, and the internal treatment in every way simple but substantial. Messrs. Niven & Wigglesworth are the architects.

"HILLSIDE," SEVENOAKS.

THE additions to this house have just been completed. Mr. Henry Eeles, of Sevenoaks, was the builder, and Messrs. Garvie, of Aberdeen, supplied the oak panelling for the billiard-room. The view here given shows the new entrance corner. Messrs. Niven & Wigglesworth are the architects.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.

THE eighth meeting of the present session was held at 56, Great Marlborough-street, on the 23rd ult. Mr. Matt. Garbutt, Chairman of the Section, occupying the chair. The paper of the evening was entitled "Correct Principles of House-Planning," by Mr. P. L. Marks. Mr. Marks explained that the class of house he intended to deal with was the moderate-sized country or suburban detached house. This he did from the points of view respectively of aspect, prospect, privacy, and convenience of arrangement, illustrating his remarks with sketches on the blackboard and diagram plans of executed houses. He contended that a carefully-studied and well-arranged plan should be the first object aimed at in designing a house. Mr. Louis Jacob proposed a vote of thanks to the author for his paper, and the discussion was continued by Messrs. Greenop, White, Satchell, and Hopkins. Mr. Hampden W. Pratt, President of the Association, said it gave him great pleasure to avail himself of this, his first opportunity of attending a meeting of the Discussion Section. During his term of office he wished to become personally acquainted with all the work going on in the Association, and he congratulated the Section on the vigour and enthusiasm with which it carried on its meetings. He believed very much in this class, and he advised all students who had passed through the other classes, and wanted some sort of continuation class, to join it. Speaking on the subject of the meeting, he thought the exercise of common sense in house-planning made many difficulties disappear. He advocated providing a good hall, and, if need be, sacrificing the morning-room to get it. After some remarks by the Chairman as to the faulty planning of eminent architects, Mr. Beresford Pite, the special Visitor, spoke. In attempting to lay down principles of house-planning, he said, one should use some discrimination. The whole lay-out of a 3,000l. house was entirely different from that of a 10,000l. one, demanding quite a different scheme and a different scale. Rules of planning for country houses were inapplicable to town houses. He advised members to take every opportunity of studying plans of big houses. Some years ago he, the speaker, made a point of going over all the houses designed by Mr. Norman Shaw, and he learnt many a lesson from the skill and variety displayed in their planning. One should get an auctioneer's order to view these when any were to let. Take every opportunity also of studying the best houses—such mansions as Penshurst, and the many Continental palaces open to visitors, and find out the principles of their planning. He disbelieved in angle-nooks; they usually meant an unwarmed room. The ordinary bay window was an abomination, and often spoiled the character of an otherwise good room. Not, however, when it was well thought out and placed in positions where it added to the effect of the room—on the long side of a dining-room, or where it would add to the length of a wall broken up by a fireplace, as it did sometimes at the end of a room. Reception-rooms *en suite*, all leading off an ample hall, made a very charming plan for a country house. Careful thought expended on the design of the hall and staircase was never wasted. The next meeting will be of a special character, in the form of a joint meeting with the Institution of Junior Engineers, and will be held in the rooms of the Royal Institute of British Architects on the 9th inst. Papers will be read by Mr. P. J. Waldram, of the Institution of Junior Engineers, and by Mr. S. B. Beazley, of the Discussion Section, on "The Desirability of a Closer Relationship between the Engineer and the Architect."

GLASGOW ARCHITECTURAL ASSOCIATION.—At the usual monthly meeting of this Association, the President, Mr. W. T. Conner, in the chair, Mr. J. A. Williamson, as delegate from the Edinburgh Architectural Society, lectured on "The Wren School." The lecturer approached his subject by a prefatory sketch of Wren's great predecessor, Inigo Jones, and then described Wren's most characteristic works, closing with a criticism of the productions of Wren's successors, and in particular Gibbs, Vanbrugh, and Hawksmoor. The lecture was illustrated by lime-light views of buildings and original drawings by the architects referred to.

ARCHITECTURAL ASSOCIATION OF IRELAND.—On the 22nd ult. a general meeting of the

Architectural Association of Ireland was held in the Grosvenor Hotel, the Vice-President, Mr. J. Howard Pentland, R.H.A., in the chair. Mr. Cecil Orr delivered his second and concluding lecture on the "History of Architecture." In his first contribution he had traced the progress of the art to the Byzantine period, and he now took up the subject at the Golden Age, which he dealt with in detail; pointing out the various errors students should guard against in studying architectural history. He described the different phases of the art till the end of the Renaissance period. Mr. Orr placed special stress on the theory of the influence of early Irish art on contemporary art in England, France, and Northern Germany, in contradistinction to the popular idea of Irish art being influenced by the art of those countries.

ABERDEEN SOCIETY OF ARCHITECTS.—An annual meeting of this Society was held on the 1st inst., when the following office-bearers were elected:—President, Mr. James South; Vice-President, Mr. Arthur Clyne; Hon. Secretary and Treasurer, Mr. John Rust; members of Council: Messrs. Wm. Kelly, A. M. Mackenzie, A. H. L. Mackinnon, George W. R. G. Wilson.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—At an ordinary meeting of this Institution, on the 1st inst., Sir John Wolfe Barry, K.C.B., F.R.S., President, in the chair, it was announced that nine Associate Members had been transferred to the class of Members, viz.:—Messrs. Aburrow, G. Fitz-Gibbon, B. Leslie, Norman J. Lockyer, E. G. Mawbey, D. H. Morton, M. Taylor, T. F. Thomson, and W. H. Williams. At the same meeting it was reported that eighteen candidates had been admitted students. The monthly ballot resulted in election of two Members, nineteen Associates, and two Associates.

COMPETITIONS.

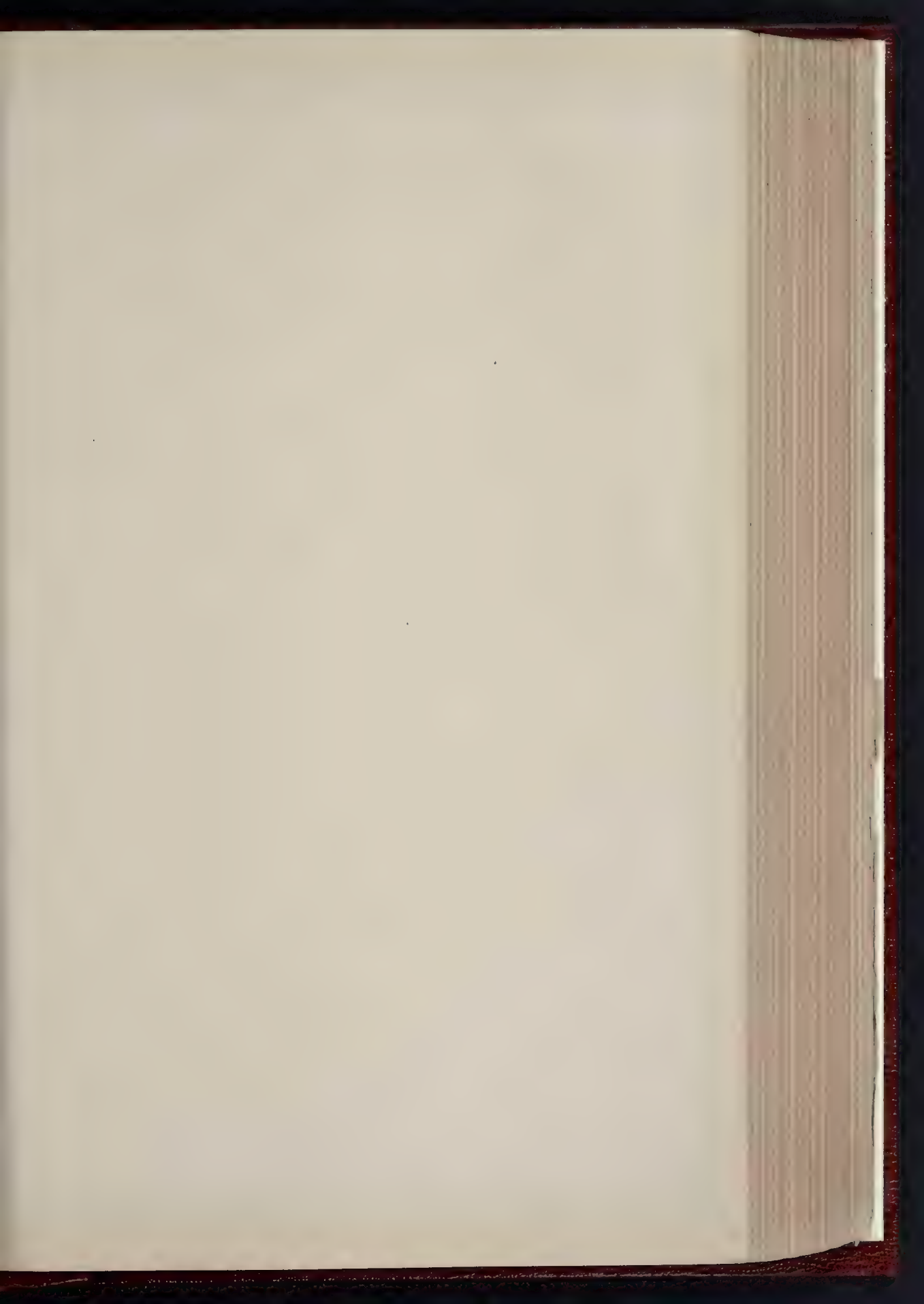
ISOLATION HOSPITAL, RHONDDA VALLEY, GLAMORGANSHIRE.—At the last meeting of Rhondda District Council, a committee brought up their report and their award on the plan submitted in competition for an Isolation Hospital to be erected by the Council at Ystradgynlais, and recommended the plan numbered 6. The report was adopted, and the successful competition was found to be Mr. W. D. Morgan, architect of Ton Pentre, Rhondda Valley. Accommodation is to be provided for thirty-two patients, matron, nurses, and non-resident medical officer, laundry, disinfecting and discharging block, &c. The cost of the proposed scheme is estimated at about 10,000l. Ten sets of designs were received.

IRONWORK IN THE DUBLIN SCIENCE AND ART MUSEUM.

In the *Builder* for January 9, 1897, we published some sketches of examples of ornamental ironwork in the Science and Art Museum at Dublin, by Mr. D. Alleyne Waller, who since then sent us the second set of sketches here published. Since we received these, we regret to hear of Mr. Waller's death.

The following are the notes which he left for the examples here given.

No. 1. "This elegant example of a small gate is described on the museum label as a 'gate' of wrought-iron scroll-work and foliage, three upright panels. Scroll top on the panels, a finial over each panel.' Nothing, however, seems to be known as to the builder, it originally belonged to, or other particulars concerning it. From a comparison with other specimens of the kind in the Museum, it appears to be of much the same date, viz., the eighteenth century, and of French workmanship. The width of the whole is 3 ft. 3 in., the height to the top of the centre finial 4 ft. 6 in. No. 2. This is described as a portion of the 'Peyre Collection,' from which some examples have already been given; beyond the mention that it formed part of this collection nothing more seems to be known with regard to it. It appears to have been much altered and adapted to its use as a 'grille' in late times, shown by the frame, the common locks, hinges, and the displacement of the two bottom rosettes. The whole has been painted a light green colour, and the rosettes gilded. The height is 2 ft. 3 in., the width 1 ft. 9 in. Nos. 3 and 4. Two plain but good examples of balcony fronts of wrought-iron scroll-work."





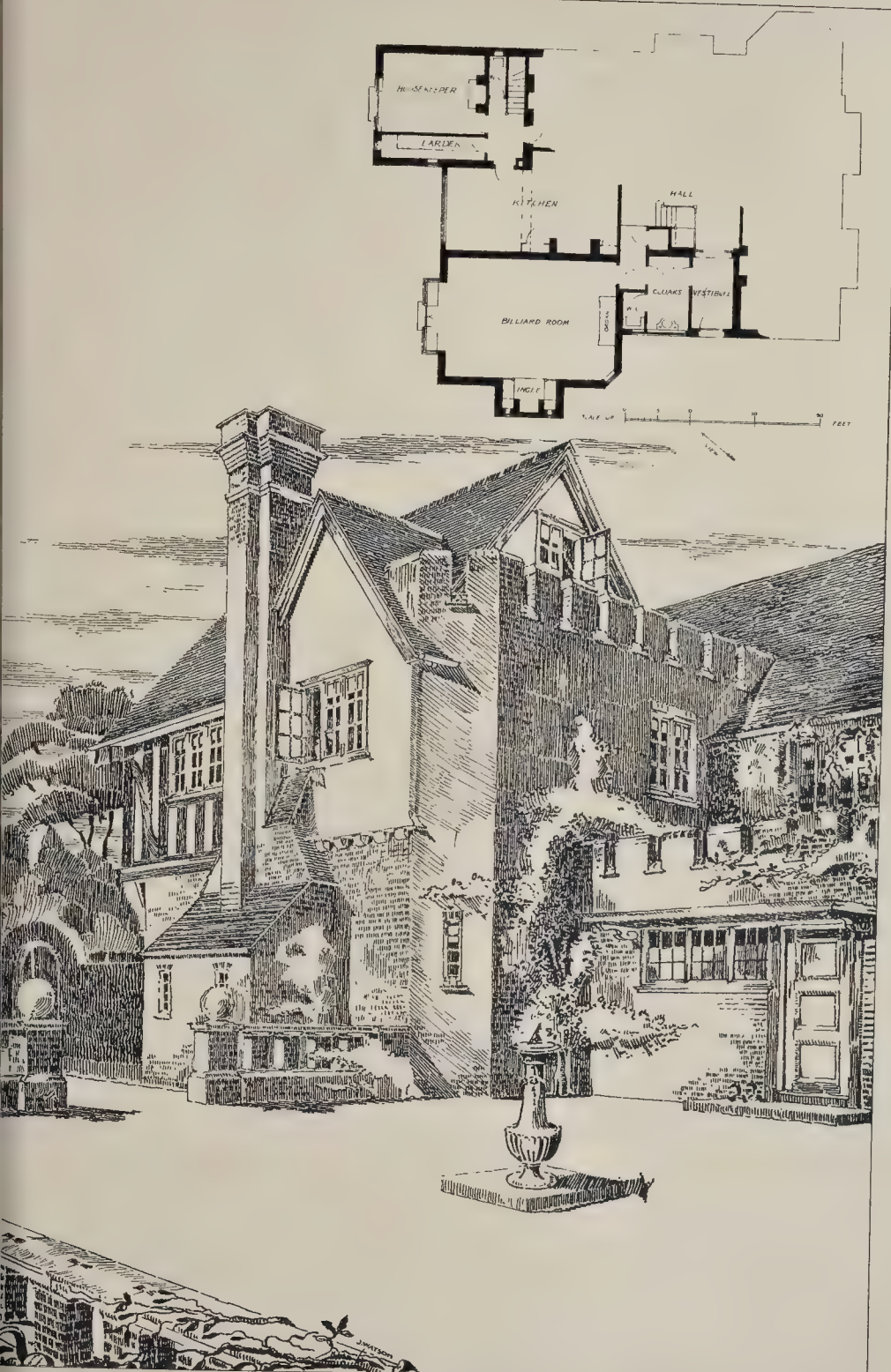


PHOTO LITHO SPRAGUE & CO. 425 EAST HARDING STREET FETTER LANE, E.C.

ADDITIONS TO "HILLSIDE, SEVENOAKS" - MESSRS. NIVEN & WIGGLESWORTH, ARCHITECTS



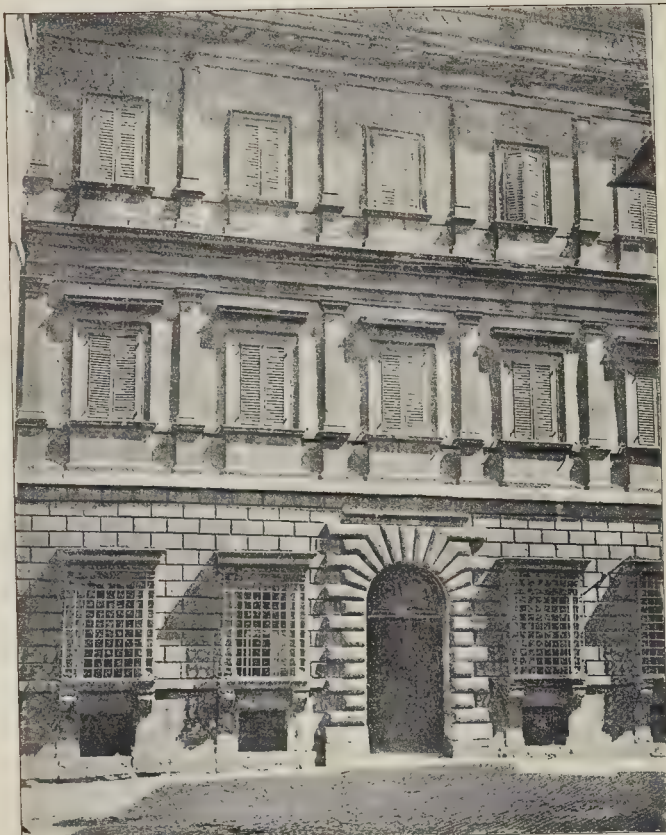


DOORWAY, SCUOLA DI SAN ROCCO, VENICE.

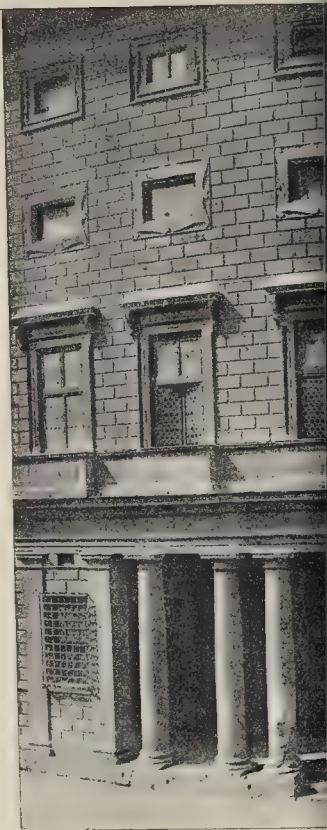


DOORWAY, CHURCH OF SAN GIOBBE, VENICE.





PALAZZO OSSOLI, ROME.



PALAZZO



PALAZZO PANDOLFINI, FLORENCE.



ROME.



PALAZZO CICCIAPORCI, ROME.



PALAZZO DI RAFFAELLO, ROME.

XX PHOTO SPH. CO. & CO. HAT LA. HAYON. 15, BERT BETTER LANE. E.C.





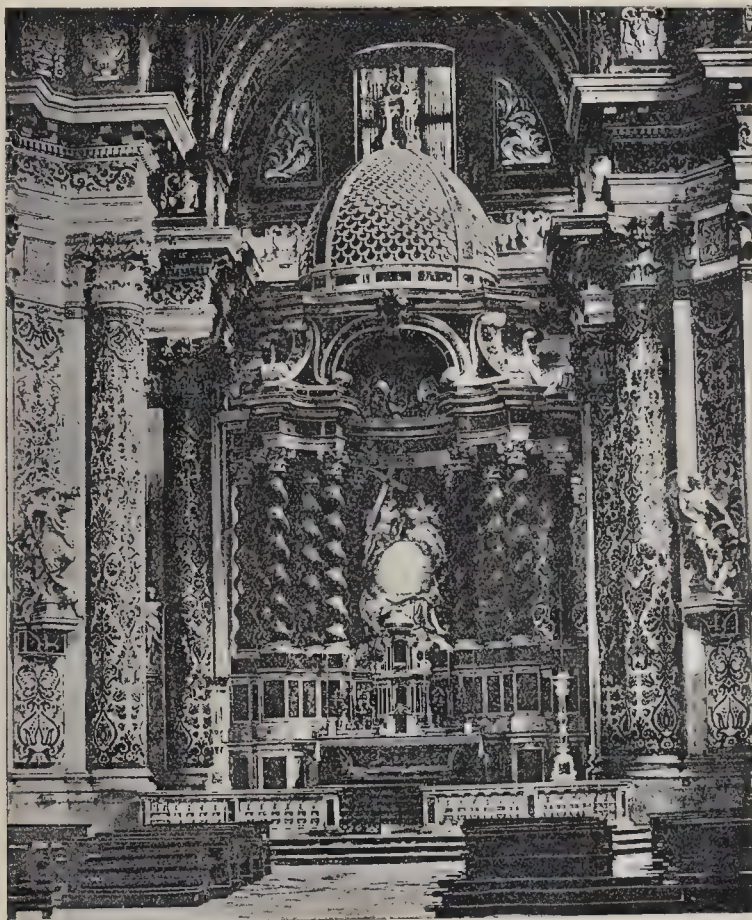
PALAZZO FARNESE, ROME.



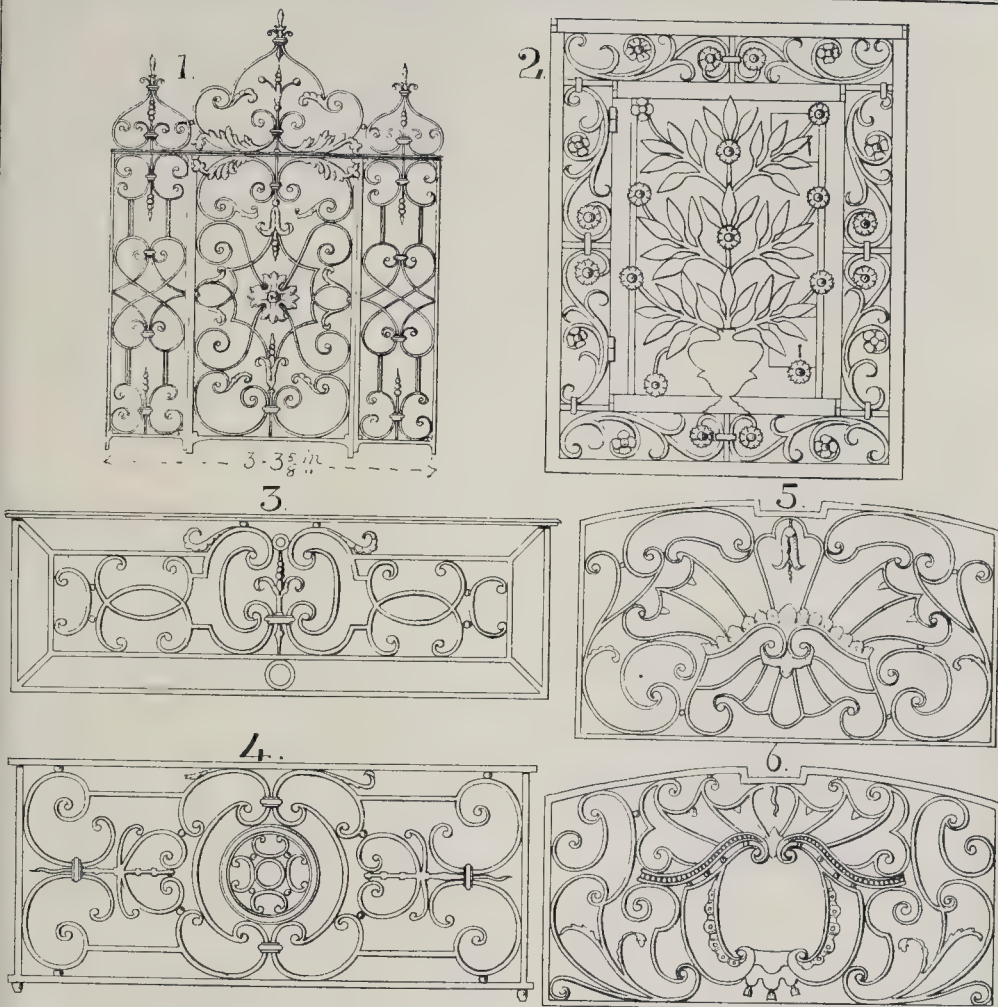
LOGGIA AT BASE OF CAMPANILE, VENICE.



PALAZZO DEL CONSIGLIO, VERONA.



ALTAR OF THE CHURCH OF THE JESUITS, VENICE.



Ironwork in the Dublin Science and Art Museum. From Sketches by the late Mr. D. Alleyne Walter.

work, with foliage. The length of the first is 5 ft. 3½ in., height 2 ft. 4 in.; of the second the length is 5 ft. 1½ in., and the height 1 ft. 11 in. Nos. 5 and 6.—Two fan-light grilles of wrought-iron scroll-work and foliage. French work, eighteenth century.

This description of 'grille' seems to have been adapted to the head of either a semicircular or segmental-headed doorway; if to the latter, it is called in French a *porte bombée*.

Having lately been shown some designs from a work by Cuvillies Père et Fils (the date of which is unfortunately lost) for balconies, balustrades, &c., the similarity was so great to the examples in the Museum and elsewhere that there can be little doubt as to fixing an approximate date. The design of these grilles, like most of Cuvillies', is graceful, and exhibits considerable ingenuity in the arrangement of the curves. It will be seen that the centre portion of No. 6 seems to have been designed for the reception of some ornament or device which is now lost. The width of these grilles is about 4 ft. 6 in."

SURVEYORSHIP APPOINTMENT.—Mr. James Saunders, A.R.I.B.A., Assistant Surveyor of Oldham, has been appointed to the post of City Surveyor and Waterworks Engineer, Chichester.

WILLING'S BRITISH AND IRISH PRESS GUIDE.—The issue of this handy and useful work for the present year has just been sent us. It is a well-arranged and reliable work, and the present is the twenty-fifth annual issue.

CEMENT ADMIXTURES.

We have received an important communication on this subject from the Chamber of Commerce.

For the past three years investigations into this matter have been made by the Cement Trade Section of the Chamber. They instructed Messrs. Stanger & Blount, of Broadway, Westminster, to make extensive experiments with mixtures of Kentish ragstone with Portland cement, and also obtained valuable evidence from Mr. D. B. Butler, Mr. Gilbert Redgrave, Mr. H. K. Bamber, and Dr. Michaelis, of Berlin, and others. After full consideration the Section adopted the following resolution:—

That Portland cement be defined as a mixture of two or more suitable materials intimately and artificially mixed in the requisite proportions, and afterwards properly calcined and ground, to which nothing has been added during or after calcination, excepting that an addition not exceeding 2 per cent. of gypsum is permissible for the purpose of regulating the setting.

That the following rule be adopted:—

That if any material whatever excepting 2 per cent. of gypsum for the purpose of regulating the setting be added to the Portland cement clinker during or after calcination, the article so produced shall not be sold as Portland cement, but under some other distinctive name.

That the members of the Cement Trade Section of the London Chamber of Commerce, together with

all manufacturers of Portland cement in Great Britain and Ireland who are not members of that Association be invited to sign the following declaration of conformity to the above rule in respect of all Portland cement made by them wherever manufactured:—

Declaration.

"We, the undersigned, hereby agree to conform to and carry out the rule of the Cement Trade Section of the London Chamber of Commerce as set forth in a report made by the Section and adopted at a meeting held on Monday, the 10th of May, 1897:— [here follows the quotation of the rule above given.]

And we further agree that if at any time any of the parties to this agreement shall by resolution of a majority of those present at a meeting of such parties duly and properly convened in accordance with the practice of the London Chamber of Commerce, such resolution having been duly and properly confirmed by a majority of those present at a subsequent meeting called at not less than fourteen days' notice, be found to have failed to conform to and carry out the said rule, then in such case his or their name or names shall be struck off the list and notice of the same made public in such manner as shall be resolved."

The above resolution was based upon the evidence of various experts, which cannot be better summed up than in the following conclusions of Messrs. Stanger & Blount:—

Ragstone is a natural form of calcium carbonate mixed with siliceous matter. It is an inert substance incapable of setting when gauged with water.

Ragstone when mixed with Portland cement undergoes no chemical change, and does not combine with cement either in the dry state or when the mixture is gauged with water.

Mixtures of ragstone and cement have a specific gravity lower than that of unmixed cement, and indeed correspond closely in specific gravity with that calculated from the respective specific gravities of the two materials. The specific gravity of normal ragstone may be taken as 2.70, and that of normal cement as 3.15, so that the difference between them is substantial.

Save for minor effects caused by the slight slaking action of moisture commonly present in ordinary ragstone, the part played by ragstone mixed with cement is purely mechanical. The product obtained from the two materials is merely a mechanical mixture, and is in no sense a chemical combination. In our opinion such a mixture cannot correctly be termed Portland cement.

Gypsum added to cement for the purpose of regulating the setting time in quantities not exceeding 2 per cent. of the weight of the cement, has no deleterious influence on the quality of the cement.

With respect to other materials, Messrs. Stanger & Blount say that they are unable to give a general opinion as to their influence on cement when mixed with it, and that they would have to report separately as to each after long and careful investigation; and they express a strong opinion in conclusion that whatever be the effects, whether good or bad, of the admixture of any material whatever with Portland cement clinker after calcination, the article so produced cannot legitimately be termed Portland cement. Each of the other experts examined endorsed this view, and the Section approve and adopt it.

We understand that the following firms have signed the declaration proposed by the Chamber of Commerce:—

Arlesley Lime and Portland Cement Company, Limited (Arlesley); Ashby & Son, Limited (London); Barron & Co. (London); Booth & Co., Limited (London); Borsal Manor Cement Company, Limited (Borsal); Burham Brick, Lime and Cement Company, Limited (London); Clitheroe Portland Cement Company, Limited (Clitheroe); Dartford Portland Cement Company, Limited (London); Dix, Green & Co. (Sutton Walden); Earle, Limited (Hull); Fomby's Cement Works Company, Limited (London); Francis & Co., Limited (Hale of Wight); Gibbs & Co., Limited (London); Globe Portland Cement and Whiting Company, Limited (London); Hilton, Anderson, Brookes & Co., Limited (London); Hooper & Co. (Southampton); Johnson & Co., Limited (London and Newcastle-on-Tyne); Laurence & Wimble (London); Lee, Son & Co. (London); London Portland Cement Company, Limited (London); McLean, Levett & Co., Limited (London); Martin, Earle, & Co., Limited (London); New Rannham Portland Cement Company, Limited (London); Patrick & Son, (Devonport); Peters Bros. (London); Phoenix Portland Cement Company, Limited (London); Ponsoby, Hon. Ashley (Arluery Cement Works, London); Potter & Son (Newcastle-on-Tyne); Queenborough Cement Company (Jaffray & Castle, London); Richardson, A. & W. T. (London); Robins & Co., Limited (London); Rugby & Newbold Cement Company, Limited (Rugby); Scott, Limited, Walter (Newcastle-on-Tyne); Skelley's Adamant Company, Limited (Hull); South Wales Portland Cement and Lime Company, Limited (Penarth); Tingey & Son (London); Tower Portland Cement Company, Limited (London); Trechmann, Weekes, & Co., Limited (London and West Hartlepool); Tunnel Portland Cement Company, Limited (London); West Kent Portland Cement Company, Limited (London); Weston & Co. (London); White & Bros., Limited (London); Wouldham Cement Company (London).

DRAWINGS FOR THE PARIS SALON.

In addition to the particulars we gave recently (page 158 *ante*) in regard to sending drawings for the Paris Salon, we may add, from the official papers of the "Société des Artistes Français" ("Old Salon") which have reached us since then, that each work must have a card attached to it bearing the name of the work and its author on one side, and that the section for which it is intended (painting, architecture, or engraving, &c.) should be indicated on the back of the frame. The artist of the work must also send a memorandum, signed by himself, giving his full name, his nationality, the place and date of his birth,* the name of the artist or artists whose pupil he was, the subjects and dimensions of his works, and his present address. We presume that this letter, like the work, is to be addressed

* This is formally required mainly in reference to the question whether the artist is eligible for certain prizes and "Recompenses" in connexion with the Salon.

"M. le Président de la Société des Artistes Français," but no special statement on this head is made. A printed form for this declaration is issued, a copy of which has been forwarded to us, but there is no statement as to where this is to be had; presumably by application to the secretary of the "Société des Artistes Français." It does not appear, however, that the official printed form is necessary, provided the required information is given.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.

THE annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works was held on Saturday last week at the King's Hall, Holborn Restaurant. Mr. William Shepherd, President of the Central Association of Master Builders, occupied the chair, supported by Messrs. Thomas Blashill, A. G. Pridmore, — Strudwick, and about 500 members and friends of the Institution.

The loyal toasts having been honoured, The Chairman proposed the toast of "The Architects and Surveyors," coupled with the names of Mr. Thomas Blashill and Mr. Strudwick. Having referred to the many new buildings which have been erected in all parts of London and elsewhere from architects' designs, he said that it was quite evident, to any one who observed and compared, that the art of architecture had advanced during the last fifty years. In regard to surveyors, they had made a great position for themselves among professional bodies in London. They had formed a powerful Institution, obtained a charter, and were now building very fine premises in Great George-street, Westminster.

Mr. Blashill, in responding for the architects, said that there was a good deal of difference of opinion amongst architects as to modern architecture, and he was a very fortunate man who was able to please all his professional brethren. All kinds of tastes existed, and he thought it was almost better to attempt something that was striking in design than something that did not interest at all. One character of modern architecture was worthy of notice, and there was a very fair exemplification of it in what he would call the beautiful hall in which they were assembled. There was a durability about the best architectural work, a wealth of colour, good workmanship and material, as well as the interest of the design as a whole. He believed that the time was coming when fire-resisting buildings would be more in demand than they had ever been before; not only in order to avoid the loss of valuable property, which was a secondary consideration, but so as to save human life, and to prevent the recurrence on the newspaper "bills" of such lines as—"Fire in London: Death of two children."

Mr. Strudwick having briefly replied for the surveyors,

Mr. W. H. Sharpling proposed "The Builders and Contractors," and in the course of his remarks he said that there would be no difficulty in getting good and reliable builders and contractors if they could depend upon fair treatment, and if there were no vexatious restrictions put upon them in carrying out a contract. A serious difficulty, which builders would soon have to face was the Employers' Liability Act, which would, probably, cost the employers a great deal of trouble.

Mr. J. Stapleton then proposed "The Governors, Trustees, Donors, Honorary Subscribers, and Visitors," coupled with the name of Mr. R. Adams, who responded.

The Chairman then gave the toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works." The Institution was, he said, doing very useful work, as was proved by the statement in the annual report that during the year 1896, had been devoted to the objects of the Institution, which sum, added to past years' accounts, made a grand total of 10,393. disbursed during the fifty-six years of the existence of the Institution. Those who worked for good and useful objects, such as the Institution had in view, could not only command the sympathy but the help of others. He regretted that there were not more employers of labour present that evening, for he thought that, owing to the peculiar relations between the employers and the employed at the present time, it was very important that employers should show their sympathy with their foremen and clerks of works. The masters

should assist the men who, in leaving the ranks to become foremen and clerks of works, gave up the benefits obtained from large combinations and societies. Foremen should not be dependent for provident benefits upon the ordinary trade societies. The employment of a builders' foreman was extremely hazardous, and it was the duty of every man in such a position to make some provision for the misfortunes to which he was liable; while, as the success of the employer's operations depended so much upon the reliability and well-being of his foremen and clerks of works, it was to his interest to assist in maintaining the success of the Institution.

Mr. J. W. H. Bedford, in reply, said that 9,695 had been granted in pensions during the last forty-seven years, as follows:—Thirty-two members had received 2,997; fifty-four widows, 6,275; and eleven orphans 421.

The other toasts were "The Chairman," proposed by Mr. John Beer; and "The Press," proposed by the Chairman and acknowledged by our representative.

During the evening a list of subscriptions for the coming year was read, the total being 1147, including 211 from the Chairman.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

THE second visit of this Association for the season took place on the 26th ult., to Claridge's Hotel, Brook-street, W. The new building, which covers the site of the old hotel, has been erected from the designs of Mr. C. W. Stephens. The interior decoration of the ground floor and part of the first floor was designed and carried out under the supervision of Messrs. Ernest George and Yeates.

The work being within a few weeks of completion, the visit was made more with the view of studying the internal decoration than the architectural treatment of the outside, which is now comparatively well known.

The main entrance from Brook-street is by an interior carriage drive arranged to set down visitors at the vestibule immediately adjoining the winter garden. This occupies the whole of the centre quadrangle, and is covered with a glazed dome. The main feature of the ground floor is the imposing dining-room, which is about 96 ft. by 50 ft., and occupies the greater portion of the west front towards Davies-street. Messrs. George & Yeates have treated this room with inlaid oak panelling, and a plaster arched and enriched vaulted ceiling. The oak work is in most instances carried up to the springing of the arches, with good effect. When finished the dining-room will form a dignified interior.

The smoking-room, with its projecting stove chimney-piece carried up, and beam treatment to the ceiling, is distinctly characteristic of the work and traditions of the architects.

Taking into consideration the sumptuous arrangement of the ground-floor we are a little disappointed with the main staircase which leads up from the west side of the vestibule. It would be invidious to criticise the desirability of the internal carriage drive, but this certainly seems to break up the planning of the Brook-street front, and perhaps for this reason alone the staircase does not possess the monumental appearance we might look for in a building of this description.

The upper floors generally are planned so that three or four rooms form private suites. This may perhaps involve an apparent extravagant use of space in occasional double corridors, but in this particular it may be mentioned that the new building partakes of the private character of the old Claridge's Hotel, which seems to have been one of the requirements of the new scheme.

Upon the first floor at the angle of Brook-street and Davies-street, there is a royal suite of apartments with access from a private staircase and a special entrance. The principal staircases are of white marble throughout. The decoration of the upper floors is very dissimilar from the orthodox hotel decoration, and the treatment Mr. Stephens has adopted is very pleasing. The green paper filling to the corridors was generally admired, and it must be admitted that the dark-stained doors, white paint, and varied tone of some of the rooms is admirable.

HOTEL, BALHAM.—The "Duke of Devonshire Hotel," Balham High-road, has been rebuilt and enlarged. The architect was Mr. Brooker, of London, and the builder is Mr. Young, of Catford.

Books.

The Cathedral Church of Winchester; a Description of its Fabric and a Brief History of the Episcopal See. By PHILIP W. SERGEANT, late Scholar of Trinity College, Oxford. London: George Bell & Sons. 1898.

MR. SERGEANT is to be congratulated on the skilful manner in which he has dealt with the mass of literature relating to Winchester, and on the clear and concise way in which he presents the result to his readers. He is evidently well acquainted with his subject, and also as an unusual command of technical terms, which he applies correctly on the whole, except in writing "groining" when he means vaulting. His description of the building is complete enough to satisfy the most exacting; and with this book in his hand the student can follow the history and development of the cathedral in the minutest detail. For nothing escapes the author's notice, not even the "sustentaculo" or "fyefot" on the stole of Bishop Edington's effigy, and those who are interested will find the most valuable possessions in the library duly described.

Moreover, Mr. Sergeant is to be complimented on doing justice to Bishop Edington (not Edington, by-the-way); in helping to dissipate the notion that his work was inspired by Wykeham. Careful research has proved the reverse to be the case, and Edington to have been the originator of the Perpendicular style. The author hardly makes it clear that Edington's work did not extend to the clearstory bays; and it might have been stated that it has been thought that he contemplated flanking the west front with flying buttresses. Also, if we may judge by the close analogy between the later windows on the east side of the north transept, and those at Edington Church, Wilts., these were the Bishop's work, too.

We do not see mention made of Canute's great munificence to the cathedral, as recorded by William of Malmesbury; or that the tower, which fell in 1107, appears to have been rebuilt in De Lucy's time, viz.: 1200. *Inchoata est perfecta Turris Winton. Eccles. (Aug. Sacr., i. 304).* Nor do we find the quaint remarks of a traveller in 1634, who was delighted "with the brave old mother-cathedral, fair and long, and St. George on horseback on the top of her flat-bottomed steeple to be sentinal." This same traveller, by the way, gives some very valuable notes on the stained glass in the Lady Chapel, and elsewhere, viz.: In the Lady Chapel a genealogy of Jesse; in the south aisle a history of the Nativity; and in the north the history of the Revelation.

It was Mr. T. D. (not J. W.) Sedding who made the fine drawing for the restoration of the reredos.

Why does the author consider that Sir George Gilbert Scott's monument to Bishop Wilberforce "is out of place in its Norman surroundings"? Would he have had it Norman, too? And surely the author must know that the pretty idea that an effigy with crossed legs implies a Crusader (in deed or intention) is exploded.

We must again point to the difficulty of reference by including monuments in the general description. Besides other matters, the author deals briefly with "Other Institutions connected with the Cathedral," including, of course, St. Cross and the College; but why the City Cross, the famous tombstone to Thomas Thetcher, and the West Gate are included under this head it is hard to say.

The views, as usual, are excellent and well chosen, and Britton's fine plates are brought in with advantage. Drawings by H. P. Clifford, an old print, and plates from Willis, Carter, and others add much to the interest of perhaps the best book of the series we have seen. It is a pity the plan does not show the different dates.

An Architect's Experiences: Professional, Artistic, and Theatrical. By ALFRED DARBYSHIRE, F.S.A., F.R.I.B.A. Manchester: J. E. Cornish. 1897.

MR. DARBYSHIRE'S interest in theatres and things theatrical, as well as a general taste for art, beyond the limits of professional interest, and for the society of artists of all classes, have led him to the acquaintance of a great many clever and interesting people, and to an experience of life rather more varied and lively than falls to the lot of all architects. Hence

his recollections have afforded him matter for an interesting and readable book, containing a good many personal reminiscences of well-known artists, musicians, and actors, and sprinkled with a good many amusing anecdotes.

Of architecture and architects, in fact, there is a good deal less in the book than might have been expected from its author's profession; but we have no fault to find with it on that score; it is a book written for the general entertainment of the author and the reader, and not for a merely professional circle. Mr. Darbyshire, however, gives us the account of his entrance into architectural study. He was articled to Mr. P. B. Alley, of Manchester, who had entered into partnership with Mr. Richard Lane; the firm of "Lane & Alley" did not suggest high art, but it was, nevertheless, "the local centre of classic thought," and Mr. Lane "was a gentleman and a scholar, whose practice was devoted to an attempt to force upon a commercial nineteenth-century town, with a sunless and humid climate, the refinement and beauty of the art of the Greeks in the Golden Age of Pericles." His pupils did not follow his lead in that sense. Mr. Waterhouse, it is implied, was one of them, and was the first to fall away from the office teaching, and by his success with the Manchester Law Courts to give the great impulse to Gothic architecture in the town. A word of appreciation is devoted to an architect of genius, Mr. Walter, who, like Mr. Lane, had laboured to introduce Classic architecture into the town. "What architectural beauty the streets possess," says the author, "was mainly owing to this man of genius" (which is hardly fair to the architect of the Town Hall). "He used Italian architecture as the means of giving beauty appropriately to the great emporium of the merchant princes. The student who contemplates these warehouse-façades will find an open book on Italian Renaissance, full of truth and beauty." During the author's five years of pupillage the office work was prosaic, but lucrative; "we were engaged principally on huge cotton mills... we tried hard to give some architectural character to the immense chimney-shafts and engine-house windows." The author's first effort at a bid for fame was to send in a competition design for the Town Hall at Pendleton, in the outskirts of Manchester. He did his best to express his admiration for Gothic architecture, but was advised to send in an alternative Classic design, which was accepted, the Gothic one being nowhere. He observes, "although disappointed, the result taught me a wholesome lesson, namely, that Mediæval architecture required a special treatment to adapt it to nineteenth-century requirements—the sort of treatment, in fact, that it has received at the hands of Waterhouse, whose high reputation is owing to his skilful adaptation of its spirit and beauty to the conditions of the time in which we live."

Among the many artistic, musical, and theatrical reminiscences in the volume, and the good stories told, perhaps the very best is that of the reply of Donizetti when asked if it was really true that Rossini wrote "Il Barbiere" in a fortnight. "It may be quite true," was the answer, "he always was so lazy."

Laxton's Builders' Price Book for 1898.—London: Kelly's Directories, and Simpkin, Marshall, & Co. 1898.

THIS hardy annual, which, we are reminded by the title page, has reached its eighty-first edition, and can, therefore, be considered the parent of price books, again puts in an appearance in the form of a bulky volume of some 1,000 pages.

A price book of the present day, apparently, is not considered complete without a large number of items which, while they are not by any means necessary for the pricing of builders' work (such as a reprint of the London Building Act and other Management Acts, the regulation of the Water Companies, and other matter), add considerably to the value of the book as a work of reference.

The remarks in the *Builder*, p. 59 ante, with regard to rate of profit and also as to the special articles, apply also to this work, although we are glad to see that the discount on "Tubes and Fittings," which was there specially mentioned, is given in a footnote.

A short chapter on the "Adaptation of a Price-Book to meet varying rates of Wages" (pp. xxix. and xxx.), is useful, although the result of working on this basis is very approximate,

and should only be used when no other means of arriving at the value are at hand. There appears, however, to be a slip in the second paragraph on p. xxx, which was apparently calculated on the basis of labour at 9½d. per hour. If this is not so, the example given is somewhat unhappy, and likely to cause confusion in the mind of anyone attempting to put into practice the rules given.

The working rules for the building trades of London, on page 664, will be found of assistance in dealing with day work.

We are of opinion that the prices for brickwork on page 51 were of sufficient importance to warrant an alteration on account of the increased price of bricks, instead of the somewhat clumsy expedient of pricing the work on the basis of bricks at 5s. per thousand less than the market price, and leaving the reader to calculate the difference in cost. This is all the more unpardonable from the fact that this increase in price is not of recent date, and that the probability of an early reduction is very remote.

The portion dealing directly with pricing—which, by the way, takes up only about a half of the total contents of the volume—will be found very complete, and the prices generally, while claiming to be only for the best work, are not so extravagant as has been the case frequently with price books, and which considerably detracted from their value.

An interesting, if somewhat startling, occupation for an idle hour would be found in the comparison of the prices in the various books; but those who have had the opportunity of comparing the bills of quantities of different contractors for the same work will not, perhaps, be so surprised at the result as those who have not had this opportunity.

A Practical Treatise upon Warming Buildings by Hot Water. By CHARLES HOOD, F.R.S., F.R.A.S. Re-written by Frederick Dye. Third Edition. London: E. & F. N. Spon, Limited. 1897.

MR. DYE has determined to keep this work up to date, and the third new edition contains useful information as to some of the latest advances which have been made in the warming of buildings by low-pressure hot-water systems. The author claims that new systems are explained which have not hitherto appeared in any English book on the subject, and, as far as our acquaintance extends, he is justified in the claim, with the proviso that "English" excludes "American." Although the Americans have originally borrowed from ourselves in matters of heating, there is no question that of late they have repaid the loan, and we have learned from them a good deal, principally from what they have done with low-pressure steam work, which has led to considerable improvements being made in our own methods of warming buildings by hot-water on low-pressure systems. What the Americans call direct and direct-indirect heating are also explained.

In any future edition we should like to see a comparison of some American patterns of boilers, particularly those of sectional type, if it is not unfair to ask this from a manufacturer who may be pardoned if he thinks his own are the best. Even as it is, we must admit, to be honest, that this new edition keeps the standard work on low-pressure hot-water heating in the pre-eminent position which it has attained.

Railway Maximum Rates, Charges, and Traffic Acts. By M. B. COTSWORTH. London: Bemrose & Sons.

Prior to the passing of the Railway Rates and Charges Acts of 1891 and 1892, it was simply an impossibility to ascertain how much the railway companies could legally claim for conveyance of merchandise. The old Acts were obscure, and notoriously open to misinterpretation, and presented a tangle that neither the judges nor the Railway Commissioners could unravel. It is still no easy matter to get at the Parliamentary maximum rates where several different companies are concerned, and here Mr. Cotsworth's little book is calculated to be of material assistance. All the Acts now governing the maximum rates are set forth and explained, together with elaborate scales for all the different classes, arranged and grouped with much ingenuity. Some application is necessary in order to master the detail, but all appears to be presented with as much conciseness as such a complicated subject will allow.

When the first edition of this work was issued, the railway companies were endeavouring to enforce to the full their new charging powers; but, fortunately, they have long since given up that experiment, and are, as a rule, content with a slight advance upon the rates previously in force. However, any one furnished with Mr. Colsworth's comprehensive scales of charges, may always ascertain whether the companies are keeping within their legal limits.

The Law of Fixtures and Repairs as Between Landlord and Tenant. By W. de Bracy Herbert, Barrister. London: Clement Wilson. 1898.

This is an excellent little book, both in substance and form. It is handy in shape, well printed, and the subject of each paragraph is printed in larger type so that each sentence shows at a glance the main subject of it. The author states the law clearly and concisely, and formulates principles in a decisive manner. This is important, for the layman does not desire to grope his way through a mass of reasoning; he wishes to be told definitely what the law on a particular point is. On the whole we regard this as one of the best little handbooks of the kind which has recently come under our notice.

The Workmen's Compensation Act, 1897. With copious Notes. By W. ADDINGTON WILLIS, Barrister-at-Law. Third Edition. Butterworth and Shaw & Sons. 1898.

Handbook on the Workmen's Compensation Act, 1897. By M. ROBERTS-JONES. Fifth Edition. Cardiff: Western Mail Office. 1898.

WE have already noticed the previous editions of the first-named work. It may perhaps, however, be desirable to mention that further notes are added to Section 3, which deals with certified schemes of compensation. This will be found very opportune, as the time at which the Act comes into operation (July 1) approaches.

As regards the second of these books, it is convenient and concise, and has evidently already been found useful.

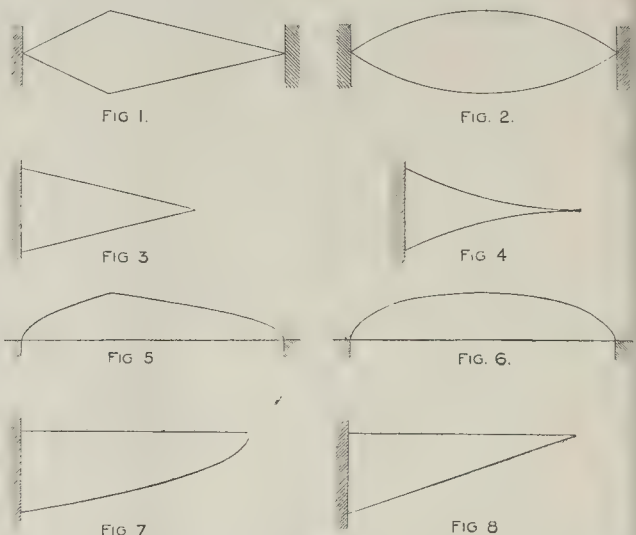
TRADE CATALOGUES.

MESSRS. HAYWARD BROS. & ECKSTEIN send us their illustrated catalogue of improved iron stable fittings, cowhouse fittings, &c. The fittings illustrated are those known as "Cotlams" fittings, which are well known to our readers. Messrs. E. Wood & Co. send us a conveniently arranged card of their steel-plate girders, joist girders, and rolled-steel joists, with sections, and tables of sizes and weight-carrying capacity for various spans from 10 ft. to 38 ft.—The Manchester Laundry Engineering Co. send us a small catalogue of cooking apparatus of various kinds, including also steam boilers, and their "steam reducing valve" for reducing steam pressure to cooking apparatus, &c.—Mr. R. D. Stewart sends us a catalogue of his special materials in paint, varnishes, and painters' plant, including his white lead, of which a chemical analysis is given, numerous colours, varnishes, and brushes; the "Scotch Soap powder" for cleaning down paint and varnish work; and his special red, dry, which we have before noticed. He also sends a specimen of his light portable iron paint-pots, which appear both cheap and durable.—The Consolidated Steel & Wire Co., of New York, send us (through their London agents, Messrs. E. Le Bas & Co.) their illustrated catalogue of "Consolidated Field" wire fencing. The special characteristic of this is that it is made in single thick wires and not in woven strands of small wires, and that allowance is made, by a slight bend at each joint, for expansion and contraction. The patentees claim that it is better than the twisted wires because they get more strength with less weight of wire, and the single wire cannot hold water which would cause rust.

BOOKS RECEIVED.

THE RENAISSANCE IN ITALIAN ART (Handbook for Sculpture and Painting).—By Selwyn Brinton. Simpkin, Marshall & Co.)

MONUMENT TO THE ETRICK SHEPHERD.—Messrs. John Marshall & Sons, builders, Hawick, have received instructions to erect the monument which the Edinburgh Border Counties Association have resolved to put up at Etrick Hall, to mark the birthplace of James Hogg, the Etrick Shepherd. The architect is Mr. Heiton, Perth.



Correspondence.

To the Editor of THE BUILDER.

DORKING WORKHOUSE INFIRMARY COMPETITION.

SIR,—In your criticism on the assessing of the above competition in last week's issue of the *Builder*, you say, "This is a method of procedure which ought to be protested against."

There can be no doubt in the mind of any one giving the question a moment's honest reflection that your opinion is right. But a question of more importance is—"How is this procedure to be protested against with effect?"

Is the protest to come from the unsuccessful competitors (a "crying over spilt milk"), or, is the protest to take a practical form, and come from the leading members of the Royal Institute of British Architects, who, when asked to "assess" a competition in this form, shall have the moral courage to say "No," even at the risk of losing a fee?

The latter seems to me the more reasonable, but I am afraid it is impracticable so long as a Fellow of the Institute is willing to lend himself to such proceeding.

J. ARTHUR SMITH.

* * We entirely agree with our correspondent that anyone asked to act as assessor in a Competition ought to make it a condition that the whole of the drawings sent in should be submitted to him, if he has any reason to suppose that this is not intended. But in this, as in some other similar cases, we do not know whether the assessor was informed of the circumstances or not.—Ed.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—X.

THE value of the graphic method of representing moments of rupture lies in the fact that it is equally possible to represent the moment of resistance of a beam by the graphic method; and, therefore, that having drawn the line showing the moment of rupture of the beam at different points, the moment of resistance at those points may be made equal to the moment of rupture; and, therefore, the beam may be made of merely the strength to afford the requisite resistance to the stress at the different points.

In timber beams it is not usual to cut the timber to the form necessary only to give the absolute minimum of strength throughout. A rectangular timber beam is usually made sufficiently strong to do its work where the stress is greatest, and the same section is continued throughout the length of the beam. The greater part of the beam, therefore, has an excess of strength beyond that necessary to resist the proportions of the stress which come

upon the various parts. It is, however, very useful to know what the shape would be of beams to resist various stresses supposing they were made of uniform strength, and all superfluous material cut away, and we therefore give some illustrations of the shape of timber beams of uniform strength. But we must ask the student to accept our statement without proof, as the proof demands a knowledge of conic sections, which we assume to be beyond the knowledge of our reader.

Taking, first of all, the shape of beams in which the depth is constant, we have in fig. 1 the plan of a beam of uniform strength with a single load, the widest part of the beam being, of course, at the point where the load is applied; in fig. 2, the plan of a beam of uniform strength with a distributed load; the bounding lines in this case are parabolas with their vertices at the middle of a beam. In the case of cantilevers, the figures are somewhat similar, the plan of a cantilever with the whole load at one end being as fig. 3, and with a distributed load as at fig. 4, where the bounding lines are again parabolas with their vertices at the end of the cantilever. If the breadth is kept uniform, then a beam of uniform strength will have a varying depth which we therefore show in side elevation. A beam with a single load has its edge formed by two parabolas, whose vertices are at the points of support in fig. 5. If the load is distributed, the elevation of the beam is a semi-ellipse, as in fig. 6. So also in the case of cantilevers with a single load, fig. 7 shows the elevation, the lower edge being a parabola with the vertex at the end of the cantilever, and fig. 8 showing the side elevation of cantilever uniformly loaded.

We may now illustrate how in iron or steel beams the graphic method of representing moments of rupture may be applied to determine the minimum size of beams. Taking the moment of rupture or bending moment, illustrated (fig. 2) in our last chapter, to represent the bending moment for which we are to arrange a beam, we will suppose that we are going to support the loads upon the beam by means of a rivetted plate girder. We will suppose the moment of resistance of such a girder under the dimension FM (fig. 9) represents the moment of resistance of such a girder with three plates in the flange, that the dimension FE represents the moment of resistance of the girder with two plates in the flange, and DE the moment of resistance with one plate in the flange; then drawing horizontal lines through M, E and C, where those horizontal lines cut the line representing the bending moment, we have the necessary length of the increase thicknesses of the plates. Thus, OP will be the length where a second plate is necessary, and QR the length where a third plate is necessary.

The student must be careful in dealing with bending moments of distributed loads at ar

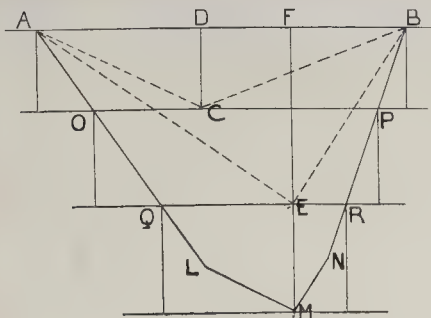


FIG. 9.

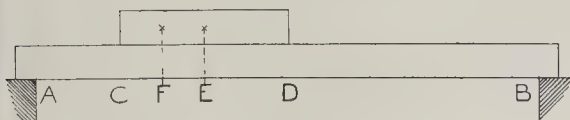


FIG. 10.

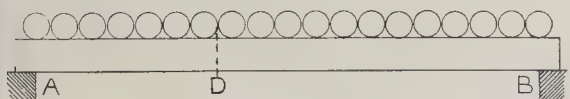


FIG. 11.

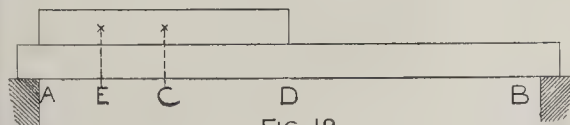


FIG. 12.

icular point. Let us just consider this detail. In the diagram (fig. 10) we suppose AB to represent a beam with a distributed load from C to D, of which the centre of gravity is at E; the reaction of the supports A and B will be in proportion to the load which they sustain, as already explained. In the forces which are acting about the point E, taking one side only for the sake of simplicity, are the reaction R_1 at A in an upward vertical direction, the moment of which $R_1 \times AE$, and opposing this a portion of the weight between C and E, acting downwards at its centre of gravity F, and its moment at E is its weight $W_1 \times FE$. So that the moment of rupture at E is $(R_1 \times AE) - (W_1 \times FE)$. Thus in the case of an evenly distributed load over the whole length of the beam, the greatest moment of rupture is at the centre of beam and is equal to half the load, multiplied by half the span minus half the load multiplied by a quarter the span or half the load multiplied by a quarter the span. At any point D (Fig. 11) the moment equals half the load on AD, multiplied by DB or half the load on DB, multiplied by AD. Thus it will be seen that generally the moment at any point equal to half what it would be at that point if the whole load were there concentrated. In the case of a uniform load extending from support over part of the beam, as in fig. 12, the centre of gravity, C, of the load must be found, and then the reactions on the supports A and B, then the moment of rupture at E, or at any point between D and B, is equal to the reaction at B, multiplied by the distance from D, or any other point which is taken

between D and B. At any point E, between A and D, the moment of rupture is equal to the reaction at B multiplied by BE, minus the load on ED, multiplied by half ED, or to the reaction at A multiplied by AE, minus the load on AE, multiplied by half AE.

OBITUARY.

M. PETITGRAND.—A very able French architect, M. Victor Petitgrand, has just died at the age of 56, after a long and painful illness. He was a former pupil of Baudouin, and was for many years attached to the Service of "Monuments Historiques," under which he had charge successively of the monuments in the department of Puy de Dôme, Haute Garonne, la Manche, and Haute Loire. Among the most important of his works was the restoration of the cathedral of Puy-en-Velay and its fortress-like cloisters. He had also restored the roots of the church of Chaise-Dieu, and at the time he was taken ill he was just completing, at Mont St. Michel, the work begun by M. Corroyer. The portion which was his special work there was the refectory, and the rebuilding of the tower over the crossing. In 1895 the Société Centrale des Architectes awarded him a medal for his studies of French architectural monuments. He obtained also a gold medal at the exhibition of 1889. M. Petitgrand was universally esteemed both for his talents and high character. In England, of course, his works of restoration mentioned above would be regarded by many in a very different light from that in which they are regarded in France; but one must estimate the work of a French restoring architect from the French point of view, and there is no doubt that M. Petitgrand was one of the ablest of contemporary architects of that school.

MR. A. ALLAN.—Mr. Archibald Allan, C.E., Burgh Surveyor for Govan, died suddenly at his office,

Hillock House, on the 23rd ult. Deceased was a native of Glasgow, and was appointed Burgh Surveyor of Govan in 1880.

MR. E. J. PURNELL.—The death took place on Sunday last, at his residence, in Coventry, of Mr. E. J. Purnell, jun., architect and surveyor.

MR. CHARLES W. CAMPION.—The death has just taken place of Mr. Charles W. Campion, architect and surveyor, of Neath. He had lived at Neath for the last forty years. Until the formation of the District Council took place he occupied the position of Surveyor to the Highway Board of the Neath Union.

GENERAL BUILDING NEWS.

CHURCH, BISHOPSTHORPE, YORKSHIRE.—A new church is being erected at Bishopsthorpe. The nave, chancel, aisles, and vestry will be built at once. It is hoped, as soon as possible, to proceed with the tower, choir vestry, south chapel, and porch. The architect is Mr. Hodgson Fowler, and the contract is being carried out by Messrs. Bowman & Sons, of Stamford.

RESTORATION OF MELDRETH CHURCH, NEAR BEDFORD.—The parish church of Meldreth has just been reopened after restoration. The contractors were Messrs. Shillitoe & Son, of Bury St. Edmunds, Mr. F. L. Pearson, of London, being the architect.

RESTORATION OF THE PARISH CHURCH, WELLINGTON, SALOP.—It is stated that Wellington Church will be closed after Easter Sunday for restoration. The architect will be Mr. C. R. Dagleish, of Wellington, with Sir Arthur W. Blomfield, A.R.A., as consulting architect.

ENLARGEMENT OF TADCASTER PARISH CHURCH.—A north aisle has just been added to the Church of St. Mary, Tadcaster. The extension has been carried out from plans prepared by Messrs. Bromet & Thorman, architects, of Tadcaster, and the addition provides extra accommodation for about eighty worshippers. In the west end is a five-light window, filled with cathedral glass. The stained glass in the memorial windows in the north wall was taken out and replaced. The contractors' work has been carried out by Messrs. W. Thomson & Son, of Sherburn-in-Elmet. The vestry screen was designed by Mr. Thorman, and has been carved by Mr. George Milburn, of York.

IMPROVEMENTS, STAVERTON CHURCH, NORTHAMPTONSHIRE.—Some improvements in this church have been carried out as a memorial of her Majesty's Jubilee. It was decided that a screen should be placed in the tower arch, and Mr. Townsend, of Peterborough, who was the architect for the restoration of the church some few years ago, was commissioned to design the screen, which has been erected by Mr. Neale, contractor, of Daventry. A further improvement has been made in the church by the insertion of a memorial window on the south wall of the nave. The glass is by Messrs. Heaton, Butler, & Bayne.

PRIMITIVE METHODIST CHAPEL, BRADLEY, YORKSHIRE.—A new Primitive Methodist chapel has just been opened at Bradley. The dimensions of the interior of the chapel, which is reached by a flight of stone steps, are 38 ft. 6 in. long by 31 ft. wide, and the height is 15 ft. 6 in. The schoolroom, which has a length of 30 ft., a breadth of 20 ft., and a height of 14 ft., is situated behind the chapel. There are three vestries. Mr. J. Hartley, Skipton, has been the architect, and the contractors were as follows:—Masonry, Mr. Thomas Atkinson, Eastburn; joiner, Mr. Thomas Green, Farnhill; plumber, Mr. Isaac Wilson, Crosshills; painter, Mr. Robert Petty, Crosshills; plasterer, Mr. John Greenwood, Crosshills; slater, Mr. Thomas Throup, Bradley. The cost of the buildings has been about £550.

BAPTIST CHURCH, LOWESTOFT.—The foundation stones were laid recently of the new Baptist Church, on London-road, Lowestoft. The new building is Gothic in style and provides accommodation for nearly 700 persons. A gallery has been provided at the front end of the building. The seats are arranged on a semi-circular plan. There will be a nave and aisles, divided by red granite columns with carved stone caps, moulded stone bases; brick arches and clerestory windows above. Two vestries are provided on the ground floor, and a classroom over the south-west lobby, with cloak-room beneath. The internal dimensions of the chapel are: width, 40 ft.; length, 74 ft. The architect was Mr. George Baines, of London.

CONGREGATIONAL CHURCH, WHITTINGTON, SALOP.—The Congregational Church which has been erected at Whittington was opened recently. The architect was Mr. Williams, Liverpool, while the work has been carried out by Messrs. Griffiths & Son, of Ellesmere and Knockin. The building, which has a frontage to the Holyhead-road, is in the Gothic style, and is of red Sweeney brick, with dressings of terra-cotta. It is 40 ft. 6 in. long by 27 ft. wide, and will seat about 180 persons. The heating is by hot-water pipes. A vestry, with other out-offices, is attached; while in the rear space is left for the erection of a schoolroom.

UNITED PRESBYTERIAN CHURCH, CAMBUSLANG.—On the 26th ult. the memorial stone of the new United Presbyterian Church, presently in course of erection at Rossbank Grounds, West End, Cambuslang, was laid. The edifice is being erected from plans prepared by Mr. William Ferguson, architect.

Glasgow. The building will be of red sandstone, and will be provided with side and end galleries. Behind the pulpit there is a recess as an organ chamber, which will be lighted by a large window. Three stone arches and piers divide the recess from the church, while the arches at the side gallery are also of stone. The front entrance, which faces the main street, has a porch giving entrance into the vestibule, with a cloak-room at one end, and an exit door at the other. There are also exit doors at the pulpit end of the church, communicating with the halls, vestry, &c. The halls are three in number. The entire cost of the building is estimated at 7,200l.

CATHOLIC CHURCH, GILLINGHAM, NORFOLK.—The foundation stone of a new Catholic Church, dedicated to Our Lady of Perpetual Succour, was laid at Gillingham recently. The dimensions of the building are 76 ft. in length, 22 ft. in width, with campanile 60 ft. high. The church will not be completed at present, the work in hand including sanctuary, sacristy, confessional, lobby, and part of the nave. The building has been designed by Mr. F. E. Banham, architect, the builders being Mr. J. Allen's executors, contractors, Becces.

CHURCH OF THE HOLY ROSARY, BALLYNAFEIGH, BELFAST.—The walls of the new Church of the Holy Rosary, Ballynafeigh, are now completed, and the structure is being roofed. The contractors are Messrs. H. & J. Martin, and the architects, Messrs. J. J. O'Shea and E. & J. Byrne. The church is being built throughout of Scrabo stone.

SCHOOL FOR GIRLS, CONWAY.—The Lord-Lieutenant of Carnarvonshire (Mr. J. E. Greaves) opened a new girls' school at Conway, on the 21st ult., as a department of the National Schools. Messrs. Grierson & Son, Liverpool, were the architects, and Messrs. Barry & Son, Llandudno Junction, the contractors. There is accommodation for 160 girls, divided into a main classroom, cookery-room, and lavatory.

ADDITIONS TO THE STATIONERS' COMPANY'S SCHOOL, HORNSEY.—It has been decided to add another wing and make other improvements to this school. The new wing will provide six additional classrooms, a chemical laboratory, a physical laboratory, and a carpenter's shop. Accommodation will be provided for upwards of 150 additional pupils. Mr. Gordon Stanham, the company's architect, will supervise the works of extension and improvements.

NEW SCHOOLS, KINSON, NEAR BOURNEMOUTH.—An addition has just been made to the present buildings at Heatherlands, for the Kinson School Board. The floor is laid with wooden blocks. The rooms are heated with hot-water pipes, this part of the work being done by Messrs. W. J. Bacon & Co., of Poole. Adjoining the schoolrooms are the cloak lobbies. The total cost of the new building is about 1,350l., and the work has been carried out by the contractor, Mr. F. Elcock, of Pokesdown, the architect being Mr. S. J. Newman, of Branksome.

PARISH INSTITUTE, COCKINGTON, TORQUAY.—It is proposed to erect a Parish Institute at Cockington. The site selected for the building is in the Sherwill-road, adjoining the National schools. The plans have been prepared by Mr. Rowell, architect, of Newton Abbot.

VOLUNTEER DRILL HALL, BLAIRGOWRIE.—On the 18th ult. a new Volunteer drill hall was opened at Blairgowrie for C company, 5th Volunteer Battalion Royal Highlanders. The building is situated in Union-street, and comprises a drill hall, 60 ft. by 40 ft., armoury, rooms for officers and men, lavatories, &c. The plans were prepared by Mr. Robert Reid, Blairgowrie.

LIBERAL CLUB, ALLERTON, YORKSHIRE.—The new Liberal Club at Allerton is situated in the Allerton-road. The building contains on the ground floor a committee-room, a card-room, and a reading-room. The reading-room and card-room are divided by folding doors, so that when necessary they can be converted into one large room, 32 ft. by 15 ft. From the entrance hall a staircase gives access to the first floor, occupied by the billiard-room, a bath-room, and other conveniences. At the rear of the club is the caretaker's house. Messrs. Fairbank & Wall, Bradford, were the architects, and the work has been carried out under their supervision.

The following were the contractors:—Mason, Mr. Thomas Haigh; joiner, Mr. John Foster; plumbers, Messrs. Haigh & Slater; plasterers, Messrs. J. Drake & Son; slaters, Messrs. H. & Nelson; painters, Mr. Walker Priestley.

PROPOSED EXTENSION OF TECHNICAL SCHOOL, DEWSBURY.—Plans for the proposed extension of the Dewsbury and District Technical School are being prepared by Mr. J. Lane Fox, architect, Dewsbury. The school, when enlarged, will have an additional frontage to Carlton-road of 69 ft.

CONSERVATIVE CLUB, NUNEATON.—A new Conservative club is being erected in Nuneaton, at the corner of Bond-street and New Bridge-street. The architect is Mr. Charles W. Smith, Grantham, and the contract has been secured by Mr. Thomas Smith, of Chilvers Coton, whose tender amounted to 5,126l.

ADDITIONS TO DUNBLANE HYDROPATHIC.—It has been decided to enlarge this establishment. A new wing will be added to the north end of the building adjoining and the existing dining-room accommodation will be increased. The increased accommodation will afford room for nearly 100 persons

additional. In the basement, underneath the new dining-room, is a servants' hall and a large servants' dormitory. Plans for the extension have been prepared by Messrs. James M'Laren & Sons, architects, Dundee, while the contract for the mason work has been secured by Messrs. J. & C. Hay, of Dundee.

STATION HOTEL IMPROVEMENTS, LIVERPOOL.—Alterations are being carried out at the Station hotel, at Liverpool, from plans prepared by Messrs. Ross and Macbeth.

NURSES' HOME, SHOREDITCH.—The nurses' new home at the Shoreditch Workhouse Infirmary was opened recently. The building has been erected at a cost of 12,500l. The home immediately adjoins the workhouse, and the buildings are connected by means of a glass arcade. The home is four stories high, and contains sixty rooms, accommodating seventy nurses. The architect is Mr. F. J. Smith, and the builder Mr. J. Stead.

NEW FIRE STATION, BRENTFORD.—A new fire station for Brentford has just been opened. It is situated in the High-street, and is of red brick, with white stone dressings. On the first floor is a room for the use of firemen, for inquests, &c., and also the living-rooms for the resident engineer. At the side is an escape station and hose drying-ground. The plans were prepared by Mr. Nowell Parr, Town Surveyor, and the work has been executed by Mr. J. Barnes, of Brentford.

BUILDING IN FLEETWOOD, LANCASHIRE.—The monthly meeting of the Building Plans Committee of the Fleetwood Town Council was held on the 23rd ult. at the Town Hall, when seventy plans were submitted; forty were approved and thirty disapproved.

BUILDING IN ABERDEEN.—A meeting of the Plans Committee of the Aberdeen Town Council was held on the 24th ult., when a large number of plans of new buildings were submitted and passed. These included plans for thirty-one dwelling-houses, of which twenty-nine are to be erected in Great Northern-road. The Committee had under consideration, on a representation by the Trades Council, the question of appointing a committee to prevent jerry-building in the city. The matter was deferred.

PROPOSED COTTAGE HOMES, ST. OLAVE'S UNION.

—At the recent fortnightly meeting of the St. Olave's Board of Guardians, the Special Committee appointed with reference to the provision of school accommodation for the Union, consequently the dissolution of the South Metropolitan School District, reported having visited the cottage home schools at Bridgend, Banstead, Hornchurch, and Croydon. The Committee recommended that schools be erected to accommodate 600 children on the system of the semi-detached cottage homes of the Croydon Union, each cottage to provide for fifteen children. The Committee also recommended that provision be made for workshops to impart technical instruction, an assembly-hall, schoolrooms and class-rooms, an infirmary, stores, a laundry, a swimming bath, a gymnasium, probation wards, a bakehouse, administrative buildings, &c.; and that Mr. A. H. Newman (the Board's Architect) be instructed to prepare the necessary plans. On the motion of Mr. Ercroft, the Committee's recommendations were adopted.

ADDITIONS TO INFIRMARY, LIVERPOOL.—About four years ago a new infirmary was erected in Smithdown-road, in the Toxteth district, under the superintendence of Messrs. C. O. Ellison & Son, architects. During the course of construction, the Board further decided to extend the boiler power so as to suit the entire establishment; a boiler-house and large chimney were added, and the whole (excepting three delayed pavilions) was completed at a cost amounting to some 34,000l. The deferred pavilions have now been completed by the same contractors, Messrs. Kelly Brothers, of Walton. The reception block and vagrants' wards are situated within a few yards of Smithdown-road, allowing of the vagrants using their department without entering the main premises, and giving the porter absolute supervision thereof. Waiting-rooms and dormitories are provided in the reception block, together with baths and all sanitary arrangements, disinfectant, and store for inmates' clothing. Further south, and fronting the gardens and the cemetery, is the nurses' home, with accommodation for thirty nurses, each having her own bedroom, with general sitting-room, and room for the reception of visitors. Sitting and bed rooms, bath, &c., are provided en suite for the lady superintendent, kitchen arrangements, bed-rooms for domestics, bath, lavatory, and dressing-rooms. From the reception block a corridor gives direct access to each pavilion, and lifts are provided by which bedridden inmates can be taken to or from the upper floor. The pavilions, placed en echelon, are entered from each side of the corridor respectively. Each ward has a large central open fire-stove, with hot pipes, and at the ends are nurses' rooms, day-rooms, special wards, baths, lavatories, &c. An operating-room is provided, having a north light, ante-room, and wards for men and women, and is in the centre of the institution. An ophthalmic room is also provided. The administration block is centrally situated, and is in direct communication with every ward. It includes enamelled brick-lined kitchen, scullery, pantry, and stores, a dining-room for the staff, dispensary, and rooms for the lady superintendents and doctors. Everything is so

placed as to be central whenever the infirmary is finally completed by the rebuilding of the women's wards, the infirmary so far being for men only. Accommodation is now provided for 420 inmates.

PREMISES, LANCASTER.—A block of buildings intended for the new premises of the Lancashire Liberal Association is being erected under the supervision of Mr. Olho B. Peter, architect, Lancaster, and Messrs. Broad & Warren, of Lancaster, as the builders.

MEETING-HOUSE, LLANDRINDOD WELLS.—The meeting-house has been erected at Llandrindod Wells for the Society of Friends. It is constructed of red Rubon facing bricks, with Cefn stone quoats, sills, and cornices. The roof is covered with Bangor slates, and ridged with red Rubon crests. The meeting-house is lighted by means of electricity. The plans were supplied, it is stated, by Messrs. Owen M. Roberts & Son, of Portmadoc, and the work has been carried out by Mr. E. H. Williams, Llanbrynmair, under the superintendence of Mr. E. P. Morris, of Llandrindod Wells.

PREMISES, BURTON-ON-TRENT.—Premises High-street, Burton-on-Trent, are being remodelled and enlarged for Messrs. Worthington & Sons, wine and spirit merchants. Mr. Thomas Jenkins is the architect for the work, and the contractors being Messrs. T. Lowe & Sons.

NEW RESIDENCE, STONEHAVEN.—A large grand house has just been completed here. It is for an English gentleman, to be used as his summer residence. It is in the Scottish Baronial style of architecture, the south and west elevations (which are the exposed ones) being built in Kenyan granite and the ashlar rock-faced, with fine picked dressings. The roof is covered with Tiberthwaite grey slates. The inside finishings are all of American poplar, except the staircase, which is of pitch pine. The following contractors have carried out the various works:—Mason's work, Messrs. G. & J. Gregory, Stonehaven; carpenter's work, Messrs. R. Thomson & Sons, Stonehaven; slater's work, Mr. Charles Maitland, Aberdeen; plumber's work, Mr. A. Mathieson, Stonehaven; plaster work, Messrs. Scott & Sellar, Aberdeen; painter's and glazier's work, Messrs. Barron & Son, Aberdeen. The building was designed and carried out under the superintendence of Mr. J. Augustus South, architect, Aberdeen.

SANITARY AND ENGINEERING NEWS.

MIDSMORE NORTON SEWAGE WORKS.—The new sewage works constructed by the Midsmore North Urban District Council were formally opened on the 12th ult. by the Chairman. The purification process adopted is that of precipitation by chemical means followed by filtration. The sewage, on entering the works, passes through a straining grating, and then through a scum and detritus chamber. The precipitant Ferrozene is next added by means of a Kellix mixer, the motive power of which is a small water wheel worked by a portion of the river water. After the precipitant is added, the sewage passes over a series of iron baffles, thoroughly mixing the chemical with the sewage, which then enters the first "Candy" circular precipitation tank (16 ft. diameter by 10 ft. 6 in. deep) at the bottom by series of vertical inlet pipes, and is discharged from the top by wood collecting channels. The sludge removed from the tank is daily by means of a revolving steel screw and is run on to prepared all-drawn sludge lagoons, where it is dried and afterwards removed for use as manure. After leaving the tank the sewage is passed through another similar size and design, and it is believed the present instance is the only one where duplication of tanks has been carried out, the engineer, Mr. F. B. B. DOUGLAS SEWERAGE SCHEME.—The committee of the Manx Legislature appointed in the matter of the application of Douglas Corporation for power to borrow 20,000l., in addition to 35,000l. already authorised, for the improvement of Douglas sewerage, sat on the 23rd ult. and, after discussing the age, set at naught the number of ratepayers who objected to the mechanical system proposed. Mr. E. Stevenson, engineer, London, author of the scheme, admitted that the only reason that existed for the mechanical system was that certain basements were below the tidal level. If these were not to be drained, the gravitation system would be better and cheaper. The gravitation system was adjourned, to allow the gravitation scheme being submitted.—*Liverpool Mercury.*

LOCAL SEWERS IN LONDON.—The Main Drainage Committee of the London County Council is agreed, subject to a condition recommended by the Engineer, to the construction of the following in

—Lewisham—100 ft. of 12-in. pipe and sewer in Cudham-street. Wandsworth—10 ft. of 12-in. pipe and concrete-sewer in Bleg-hoad; 400 ft. of 18-in., 435 ft. of 15-in., and 12-in. ditto in Falsbrook-road; 830 ft. of 45 ft. of 12-in., and 5,790 ft. of 9-in. pipe and sewer in Aylsham-street, Creedenhill-Cunliff-street, Eastwood-street, Falsbrook-Fernthorpe-road, Gorsehill-street, Kettering and Penrith-street, Furdzdown Park Estate, am-lane, Streatham, for surface-water only; 70 ft. of 9-in. pipe sewer in Cross-road, Clap-manton, Whitechapel—650 ft. of 12-in. pipe concrete sewer in Underwood-street, Vallance-

ROUR EXTENSION, INVERNESS.—On the 10th ult. a meeting of the Trustees of Inverness was held for the special purpose of considering the various schemes for the extension and improvement of the harbour, wharfage, and piers recommended by Messrs. D. & T. Inneson, C.E., Edinburgh, and Mr. James Fraser, Inverness. The first scheme recommended by Mr. Fraser involved an expenditure of 34,270*l.*, as this sum was considered too great, the pier was asked to submit a modified scheme, and such items as might be delayed. This scheme recommended work to the cost of 27,000*l.* to be done. After considerable discussion, it was moved that the Trust secure the services of a consulting engineer experienced in river harbours to aid them in coming to a decision, recommending Mr. Deas, Consulting Engineer to the Navigation Commissioners. Bailie Macdonald moved as an amendment that three of the recommended items, entailing an expenditure of 7,000*l.*, be proceeded with, but on a division the motion was carried by 9 votes to 4.

TON-IN-ASHFIELD SEWAGE WORKS.—The new sewage works constructed by the Sutton-in-Ashfield District Council, from plans and specifications prepared by their Surveyor, Mr. W. McEish, opened on the 21st ult. The works have been in use for some months, and were constructed at a cost of over 7,000*l.* The contractors were Messrs. Lane & Son, of Skegby. The process used is that known as the "International." The weather flow is about 260,000 gallons per day, of a highly concentrated character.

PAINTED GLASS AND DECORATION.

WINDOW, PARISH CHURCH, WEST LYDFORD.—Painted-glass window has been inserted in the side of the parish church, West Lydford, near North, to the memory of the late Dr. Culling. The window is of three lights. It was supplied and executed by Messrs. Frederick Drake & Sons, Leicester.

NEW WINDOWS AND REREDOS, ST. JOHN'S CHURCH, BARNSELY.—Two new stained glass windows and a reredos, placed in the chancel of St. John's, Barnsley, were dedicated recently. The windows depict, one the Crucifixion, the other the Resurrection of Christ. The windows are of three lights, and the reredos is of carved oak. The works are by Messrs. Percy Bacon Bros., London; and Messrs. Mr. Hedley, of Newcastle.

FOREIGN.

ANCE.—M. Larroumet has been appointed permanent Secretary to the Académie des Beaux-Arts in the place of Comte Delaborde. The Secretary has been successively Professor of Architecture at the Lycée Henri IV., Directeur des Beaux-Arts, and Professor of French Literature at the Sorbonne.—There is talk of erecting a monument to the poet Paul Verlaine in the Luxembourg gardens, near the Médicis fountain, and of a bronze bust of the poet, mounted on a pedestal and surrounded by allegorical figures. Niederhausen-Rodo is to be the sculptor.—The municipality of Versailles have voted a considerable sum for new works, including the restoration of the Hôtel de Ville and the erection of a statue.—The municipality of Besançon have decided to compete for the restoration and enlargement of the Hôtel de Ville.—M. Injalbert, sculptor, is just completing a group of monumental dimensions for the theatre at Orange.

GERMANY AND AUSTRIA.—660 metres length of waterpipes are to be laid in Vienna at a cost of 100,000 florins.—The town council of Graz are taking steps for acquiring sites on which to erect a school for the children of which has been decided by the municipal school inspector.—The committee of the restoration committee of St. John's, Prague, has submitted the plans to the Mayor for the approval of the Council of the City. The architect is Herr Anton Cechner, and the estimated cost 160,000 florins.—The Protestants of Prague have secured the finest site in the town for their new church, for the sum of 200 florins, to be paid in twenty annual instalments! The church is to be in the Gothic style; the building will be commenced in 1899.—A girl's school, with chapel, is to be erected at Chrudin, in commemoration of the Jubilee of the Austrian Emperor.—The Moravian Land purchased for 65,000 florins a house in Prague, to be adapted as a Gendarmier barracks.

—The Reformed congregation at Steinbruch has, after long efforts, succeeded in raising enough money to build its new church, and intends to set about the work in the spring.—A site has been granted for a Technical Institute at Buda Pesth, and another for a Museum of Fine Art, provided the original scope of the museum be not departed from.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Vulcan Boiler and General Insurance Company, Limited, has removed the London branch of its offices from 77, King William-street to 3, Eastcheap, E.C.

DUBLIN MASTER BUILDERS' ASSOCIATION.—On the 19th ult., the annual dinner of the Dublin Master Builders' Association was held at Jury's Hotel. The company numbered about ninety, and the Right Hon. J. M. Meade, LL.D., President of the Association, occupied the chair. The loyal toast having been honoured, the High Sheriff proposed "The Master Builders' Association." It was a sound principle, he said, that that Association recognised in the fullest sense that the employer had his duties as well as his rights, and that when an employé gave an honest day's work he would get a fair wage. The Chairman, in replying, said their Association dated back for some years, but, in the course of time, it became moribund until, in the stress of circumstances, having to face a large strike that took place two years ago, it was found necessary by the builders of Dublin to resuscitate the Association and bring it into active work. The resuscitation of the Association was not only for the benefit of the master builders, but also the workmen, because every member of the Masters' Association, when he got a fair day's work, was prepared to pay the full rate of wages that could be obtained in the district at the time. As to their progress during the past year they had nothing to report. They had had no difficulties with their men, and that was something to be thankful for. They never had any difficulties with the architects. He was sure there would be no difficulty in settling any difference that would arise between any architect in Dublin and members of the Master Builders' Association. He then proposed the toast of "The Royal Institute of the Architects of Ireland" and the "Architectural Association of Ireland." In no city in the empire could that toast be proposed with more appropriateness than in Dublin, because of the skill of the architects who went before them. Taking their city itself, they had those two old cathedrals, built some centuries since—monuments to the architectural designing of their forefathers and to the builders who carried out their work. Coming to the end of the last century, they found the city studded with magnificent buildings, but when they came to the present he made bold to say that they had nothing to be ashamed of. The numerous buildings that had been erected within the last fifty years in Dublin—churches, banks, and private dwellings—were worthy to rank with the best creations of their forefathers. He pointed to the Museum and groups of buildings in College Green, and remarked that, taking all things into consideration, these were worthy of the genius of their Irish race. When they looked at the architect of to-day and saw what he was called upon to do, and considered what the architect had to do in days gone by, they would see a vast difference. In the old days the architect superintended one building for two or three years, and saw that every window and door in it was properly erected. In the present day a client came to an architect and said he wanted a building—a theatre, for instance—capable of accommodating 2,000 persons, all the arrangements to be perfect, and the designs to be prepared and the building put in the tradesmen's hands and completed probably in twelve months from the time the client first saw the architect. In the old days an architect would say that was impossible. He coupled with the toast the names of Messrs. Mitchell, Barry and Orpen.—Mr. Mitchell, in reply, said their Institute was not only a metropolitan society, but it had a strong following in Belfast, Cork, and all the country towns, and it was now allied with the Royal Institute of British Architects. Owing to their increasing numbers they had recently taken rooms of their own, so that in future they would have an architectural home in Dublin that would enable them to carry out many reforms they were not able to effect before.—Mr. Barry thought Irish architects had no reason to be ashamed of the position they held collectively as an Institute compared with their professional brethren in England. Much better fellowship existed amongst them in Ireland than in England.—Mr. Orpen then responded.—The Chairman said he had now a very pleasing duty to perform, and that was to make the presentation of a silver salver, teapot, and stand to their Hon. Secs., Mr. John Good, on behalf of the Association, in honour of his marriage, and in appreciation of his service to the Association.—Mr. Good suitably replied.—Mr. Lidwell proposed the toast of "Our Guests," and the High Sheriff and Mr. C. Dawson responded.

THE LONDON COUNTY COUNCIL AND THE WORKS DEPARTMENT.—The referee's award in the

action between James Miller (plaintiff) and the London County Council (defendants), remitted by order of Mr. Justice Hawkins from the Queen's Bench Division to Mr. Herbert Thomas Steward, architect and surveyor, of 45, Parliament-street, was received on the 24th ult. Litigation in the case has been pending since 1895. The plaintiff in the action is the owner of a number of small cottages in Miller's-avenue, Stoke Newington-road. At the rear of these cottages, and on a much lower level, was a building which had been decreed as dangerous by the County Council officials. The case for the plaintiff was that the County Council sent their workmen from the Works Department and altogether demolished the alleged dangerous structure. In doing so they removed a portion of a wall which had hitherto held up the higher land at its back, and plaintiff's cottages were then in danger of falling down. To make the damage good the plaintiff had to build a new wall, and he called on the County Council to recompense him for the cost he had been put to. As they declined to pay he brought an action for damages. The referee awarded the plaintiff 17*l.* 10*s.*, and directed the defendants to pay the plaintiff his costs of the law action, including the costs of the reference and also the referee's fees and the costs of his award. The fees and the costs of the award were assessed at 6*l.* 9*s.* 6*d.* There were several counsel engaged in the case and twenty-nine witnesses.—Times.

APPRENTICESHIP.—In the Chancery Division of the High Court of Justice an application was recently made that the apprenticeship deed of a ward of Court should be settled by the Plumbers' Company, and a form drawn up by the Company has been approved by the judge, Mr. Justice Romer. In addition to the usual provisions based on the indenture for apprentices in the City of London, approved by resolution of the Court of Common Council, April, 1889, special covenants were inserted binding the apprentice to diligently attend evening classes of technical instruction as directed by the master, under penalty of a reduction in wages, and binding the master to provide for attendance of the apprentice at the courses of instruction, and the examination in knowledge of sanitary plumbing and workmanship prescribed by the Plumbers' Company, or any statutory body empowered to keep a register of qualified plumbers. These covenants were introduced with the object of encouraging and promoting the apprentice's efficiency, and are novel in the practice of the City of London and the Court of Chancery.

THE PROJECTED FEDERATION OF LEEDS BUILDING TRADES.—The Leeds master builders held a meeting on the 23rd ult. in the committee-room of the Royal Exchange, the President in the chair. The federation of the building and allied trades was approved, and representatives of the Master Builders' Association were elected. The demand of the masons was discussed, and there was a disposition to meet the men, conditionally on the rules being modified. The small amount of question by some of the men and the unwritten rules were referred to as hindering the adoption of a generous policy.

THE PROPOSED DEMOLITION OF A HISTORIC ABERDEEN CHURCH.—The Marquis of Huntly, Lord Rector of Aberdeen University, has received from Mr. A. Marshall Mackenzie, A.R.S.A., architect, a statement to the effect that the question of the retention or not of Greyfriars' Church as part of the University buildings at Marischal College is a subject to which he had given much consideration ever since the first proposals for extensions towards Broad-street were made, and had frequently advised that the old Gothic building should be retained and restored. He held this opinion from strong reasons, quite independently of the strong antiquarian and historical ones that existed. The quadrangle would lose in effectiveness if thrown entirely open by the removal of the church. In any restoration of the Greyfriars' building the mean-looking modern parts, such as the wing towards the quadrangle and the gable next the entrance-gate, would be demolished, the church lengthened by a bay, and the beautiful series of seven windows facing Broad-street filled with tracery. The restored building would therefore have quite a different appearance from that presented to the eye at present. Its dark freestone colour would form a refreshing contrast to the light grey granite of Marischal College, and the long horizontal lines of the church would, in the same way, enhance by contrast the vertical lines in which Marischal College was designed. The slight departure from the symmetrical position of the south tower, which the retention of the church would involve, was a distinct gain to the general artistic effect of the buildings, and would prevent a feeling of over-symmetrical symmetry. He feels quite certain that the effect of the whole will be much more delightful and beautiful if the building is retained, to contrast and group with the new, than if it were demolished, and the quadrangle entirely exposed.

ARCHITECT AND CLIENT AT BIDEFORD.—Mr. Robert T. Hookway, architect, at Bideford County Court on the 23rd ult., sued Mr. E. W. Sealy-Vidal, of Abbotsham, for 10*l.* 10*s.* Mr. A. F. Seldon, for plaintiff, stated that on May 19 defendant instructed Mr. Hookway to prepare plans for a villa at Abbotsham. Two days later defendant asked for plans for

a small bungalow. Plans for the villa were partially completed, and the second set were prepared. On May 22 defendant said he would decide which plans he would have. A few days later, however, he said he had changed his mind, and wanted plans for a smaller villa than the first. A third set of plans were prepared, and defendant caused them to be altered. Specifications were then directed to be drawn, and advertisements for tenders inserted. At Michaelmas the account was sent in, Mr. Hookway, jun., afterwards met defendant, who complained that the fee for the plans was too much. Mr. Hookway, jun., offered to accept 8l. 8s. Defendant agreed to pay that amount, but subsequently offered 5l. 5s., and said if that was not accepted they could do without it. Mr. Gosman said he was instructed that the "plans" were merely preliminary sketches. Defendant directed plaintiff not to exceed 350l., yet plans were prepared for a villa to cost 850l. As to the other plans, there was no instruction, but here the question of reasonable remuneration came in. Judge Bercsdorf came to the conclusion that Mr. Hookway had not exceeded his instructions, and allowed the claim with costs.

BUXTON AND THE ELECTRIC LIGHT.—At a recent meeting of the Buxton District Council Professor Kennedy's report was submitted as to the electric light. It stated that the estimated cost of works for Buxton would be 18,000l. He recommended land belonging to the Council in connexion with the gas works, also the property of the town, for erecting the generating station. It was decided to call a meeting of the Council to discuss details.

THE BISHOP HOOPER MEMORIAL AT GLOUCESTER.—Mr. W. Waller, architect, who was requested to examine the Bishop Hooper monument, which stands on the spot where the martyr was burned at Gloucester, reports that the structure is in a very bad condition, if not actually dangerous. The stone work is very much perished, and at the base of the spire there are serious indications of crushing and settlement.

THE OLD GATEWAY, ST. BARTHOLOMEW THE GREAT.—The plans that have been recently made public for widening Jewin-street, in consequence of the recent great fire, and for connecting it with West Smithfield by means of a road through the centre of the parish of St. Bartholomew the Great, will have, as a consequence, if carried out, the demolition, it is stated, of the Early English gateway which leads from the old priory into Smithfield.

ARTISANS, LABOURERS, AND GENERAL DWELLINGS COMPANY.—The thirty-first annual report of this company shows a continued prosperity. Between the first five years (1867-1871) and the last five (1892-1896) the capital of the company has increased 18,880l., to nearly two and a half millions; the increase of the last term of five years over the preceding one being rather over half a million. On the most recently developed estate—Leigham Court, Streatham—202 houses and 252 "maisonnettes" are let and occupied, and sixty-one houses and eighty-two maisonnettes will be ready for occupation during the year. The rental of this estate for the year was 11,500l. 15s. 10d., being an increase of 4,778l. 14s. 1d. on the previous year. The Rev. W. H. Booth, vicar designate of St. Margaret's, Leigham Court, has completed the purchase from the company of the site for the permanent church, mission-house and parsonage, which will be proceeded with as soon as possible.

METROPOLITAN ASYLUMS BOARD.—An ordinary meeting of the managers of the Metropolitan Asylum District was held at the County Hall, Spring-gardens, on the 26th ult., Sir Edwin Galsworthy, the Chairman of the Board, presiding. The Finance Committee presented statements showing the net expenditure at the several asylums and hospitals of the managers during the half-year ended at Michaelmas last. They recommended that the estimates of expenditure now submitted be approved and adopted, and that contribution orders be assessed upon the several parishes and unions in the district. Mr. A. C. Scovell, Chairman of the Committee, in moving the adoption of the recommendations, said the total expenditure of the managers for the year ended Michaelmas, 1897, amounted to 665,393l.—an increase of 40,270l. upon that for the year ended Michaelmas, 1896. This increase was mainly accounted for by the opening of the Brook Hospital involving an additional expenditure of 33,000l. The item for maintenance of buildings, including wages and works of a special character, and also furniture, made a total of 69,000l. The recommendations of the Committee were adopted. Upon the presentation of the report of the Special Committee in the matter of the Brook Hospital expenditure, Mr. J. Brown said that his name had that day been mixed up by certain London newspapers with what was said to be a gross scandal in connection with the erection of the Brook Hospital. He had been accused of supplying the bricks which were used in the construction of that hospital. Mr. Brown went on to explain that he was the maker of a special sort of ornamental brick which was used by builders all over the country, and that a comparatively small quantity of the bricks, which had been supplied by him to the merchants in London, had been used in the ornamentation of the Brook Hospital. It was, he said, done without his knowledge and it was a matter over

which he had no control. He thought the way in which the matter had been brought up was a gross injustice.—Mr. E. White moved the adoption of the Committee's report. In this it was stated that the original estimate for the erection of the Brook Hospital was 194,810l., and the amount of the tenders ultimately accepted 218,171l. 16s. 2d., whilst the amount which the managers were asked to pay in settlement of the contractors' final claims was 268,597l. 17s. 2d. The difference between the total amount of the accepted tenders, 210,018l. 6s. 4d., for which the architect was responsible, and the total amount for which he was prepared to certify in settlement thereof was 49,383l. 14s. 8d., of which 10,723l. appeared to have been sanctioned by or reported to the Board, leaving the balance to represent the value of work ordered on the architect's individual responsibility over and above the value of the works for which tenders were accepted by the Board. Mr. Aldwinckle, the architect, was blamed by the Committee for having underestimated the amount of work necessary in many cases, and for making no provision in his original estimate for many incidental matters. While he estimated that the cost of extra foundations was about 5,000l., the actual value of the measured and certified work amounted to nearly four times that amount. It was admitted that in the Brook Hospital the managers possessed an admirably arranged and well-built establishment.—Mr. J. H. Brass moved, as an amendment, to the Committee's recommendation, that the contractors' claims be finally adjusted be approved. That the report be referred back to the Committee for them to report as to the cause of extra expenditure, as to the several contractors not executing the work in accordance with their sealed contracts, as to the power of the architect to order additional work without the authority of the Board, and as to whether the certificates of the architect for such work were not *ultra vires*. Mr. Monson seconded the amendment. After some discussion the debate was adjourned.

ELECTRIC LIGHTING, METROPOLITAN FIRE BRIGADE.—The headquarters of the Metropolitan Fire Brigade, Southwark, is to have a complete electric lighting installation. The contract has been let by the London County Council to the National Electric Free Wiring Company. The work comprises steam dynamos, storage batteries, incandescent and arc lighting complete. The "National" patent system of house-wiring is to be used throughout.

VULCAN BOILER AND GENERAL INSURANCE COMPANY, LIMITED.—At the annual meeting of this company the directors presented their report for 1897, which shows that the gross revenue for 1897 was 128,410l. 18s. 11d. as compared with 100,826l. 16s. 10d. for the year 1896, being an increase of over 18,500l. The company has taken over the business of the late "Boiler Insurance and Steam Power Company, Limited," in its entirety.

INDICATOR LATCH FOR LAVATORIES.—Mr. J. N. Maskelyne has patented a new indicator latch for the closets in lavatories, to meet the objection to those now in use, that the word "engaged" does not always fully show (through the bolt being only half shot). In Maskelyne's new indicator this is overcome by an arrangement by which the door cannot be properly fastened until the whole word shows in the opening. The latch is also arranged to be opened from outside by the attendant's key, in cases of emergency, and the indicator can be set to "engaged" by the attendant, should the visitor neglect it.

PROTECTED BUILDINGS.—A builder named William Sanderson was summoned at the Second Court of the Sheffield City Police recently for having failed to erect proper hoardings and fences before the site of two houses he intended to build in Rustling's-road, to separate them from the street. On February 15, a police-constable found the footpath in front of the house which were in course of erection, for a space of 40 yards, covered with various building materials. There were no hoardings or fences put up to protect the buildings. Defendant, who had previously been cautioned, said other builders did not provide fences, and he thought he could do the same. He was fined 10s. including costs.

DOUGLAS MASTER BUILDERS' ASSOCIATION.—The Douglas master builders inaugurated their Association with a dinner at the Victoria Palace Hotel on the 24th ult. The chair was occupied by Mr. Mark Carine (President of the Association), and the vice-chairs by Mr. W. J. Fargher and Mr. A. E. Fowler (the Secretary). The Association was bound to the health of the master builders and success to the Association, Mr. J. J. Taggart said that his knowledge of the history of Douglas taught him that the builders were one of the foremost and most enterprising branches in our industrial life. He congratulated the Association on their good sense in banding themselves together, and this, he said, was bound to benefit them individually and collectively, and promote the prosperity of the building trade of Douglas. The President, in responding, remarked that their Association was formed for the purposes of defence, not defiance. He enumerated the specific objects of such associations, and pointed out the advantages in other places, and how their Association had recently strengthened their own hands in dealing with complications in the trade.—Mr. D. Clarke proposed the health of the architects, and said he

was glad to see such a number of them present. The services of an architect were an advantage to the public, as his efforts insured more beautiful and often more comfortable buildings than what the builder would provide if left to his own resources. He would ask Mr. D. Arkell, of Birmingham, who was carrying out the contemplated alterations to that historic old pile, Castle Mona, and Messrs. Rigcol, Forman, and Gwynne, of London, who Mr. Arkell congratulated the masters upon their course of action, and gave some practical examples of his own experience in England to show the advantage of such institutions. Speaking of the engagement which brought him to the island, he might say that he had heard many expressions of fear that the matter. They were, however, as anxious as any one, to retain as much of the historic and interesting associations of the building as was compatible with the considerations he had named.—Mr. Rigby, in the course of his reply, dwelt at some length on the relations between client and architect, and architect and builder, and client, which he pictured as often were going to ruin the architectural beauties of the good deal of give and take on both sides. Messrs. Heslop and Forrest also replied to the toast. Mr. R. W. Creer proposed the "Town and Trade of Douglas." He coupled the toast with the names of Mr. Hannay and Mr. Broadbent, who responded.

ARCHITECTS' BENEVOLENT SOCIETY.—The annual meeting of this society was held in the rooms of the Royal Institute of British Architects on the 9th inst., to receive the report, balance-sheet, &c. The President, Professor Aitchison, R.A., will take the chair at five o'clock.

THE PEABODY FUND.—The thirty-third annual report of this fund for the year 1897 states that the net gain of the year, from rents and interest, was 1,200l. The capital expenditure on the year was 1,200l. and buildings during the year was 1,250,300l. 10s. 8d. At the end of the year the trustees had provided for the artisan and labouring poor of London 11,300 rooms, besides bath-rooms, laundries, and lavatories. These rooms comprised 5,121 separate dwellings, viz.:—Eighty-six of four rooms, 1,781 of three rooms, 2,200 of two rooms, and 8,314 of one room. The average rent of each dwelling was 4s. 4d. a week, and of each room 2s. 2d. The rent in all cases includes the free use of water, laundry, sculleries, and bath-rooms.

CAPITAL AND LABOUR.

WAGES IN THE PAVING DEPARTMENT, MANCHESTER.—According to the *Manchester Courier*, an advance of 1s. per week has been made in the wages of paviors, beaters, paviors' labourers, flag layers, and labourers in the paving department. The service of the Finance Committee of the Manchester Corporation. After adding the increase just given the Manchester rates will be as follows:—Pavior (number employed 50), 34s. per week; beater (number employed 83), 25s. per week; pavior labourers (number employed 95), 23s. per week; flag drawers (number employed 37), 33s. per week; flag layers (number employed 168), 25s. per week; flag layers' labourers (number employed 40), 23s. per week. Fifty-three hours constitute the week.

CARPENTERS' AND JOINERS' SOCIETY.—The thirty-sixth annual report of the Associated Carpenters and Joiners' Society for the year ended October 31, 1897, has just been printed. The income for the year amounted to 14,182l. 3s. 8d., an increase of 1,177l. 16s. 5d. over the previous year. The expenditure totalled up to 10,870l. 15s. 5½d. The sum included 3,720l. 18s. 1d. for sick alms, 1,153 9s. 1d. for superannuation, 722l. for funeral allowance, 809l. 17s. 1d. for tools compensation, 286l. 16s. 3½d. for strike allowance, 680l. 3s. 1d. for other expenses, 121l. 17s. in grant from benevolence and contingent fund, and three bonuses of 50l. each to disabled members. A gain of 3,311l. 8s. 2½d. was left. The number of branches affiliated was 19, with a total membership of 8,786, an increase of nine branches and 786 members.—*Newcastle Leader*.

HOUSE DECORATORS AND PAINTERS,PLYMOUTH.—The fourteen painters and house decorators of Plymouth, having made demands for an increase of wages and shortening of working hours, a conference has taken place between the employers and a deputation from the Amalgamated Society of House Decorators and Painters. The result is that in future, the men will be paid 7d. an hour, and the work will cease at 12 o'clock on Saturdays and at 5.30 on other days, on and after March 5.

COVENTRY MASTER BUILDERS AND PLUMBERS.—The dispute between the Coventry master builders and the plumbers and painters has been settled. A joint meeting of delegates from masters and men was held, at which a compromise was offered by the employers. The masters agreed to concede to the men a demand for ½d. per hour increase of wages provided that they in turn agreed to abide by the old code of working rules, which had been in force for some years, and forego the alterations the

Carlton Hushwafue, (ark. 1 Turk.)	"Back Lane Farm,"	
71 s. 22. 0 p. f. and		43.300
Chelsea. —	Upper Chyme-row, a sculptor's	
	premises, ut. 40. 80s. g. r. nil	410
	Britten-st., i. g. r. 40s. ut. 7 yrs. g. r. 30s.	260
	Milner-st., "Stanley House," ut. 45 yrs. g. r.	210
	17. 58s. r. 135s. with reversion to other pro-	
	perty	1,700
	Milner-st., i. g. r. 27s. ut. 33 yrs.	175
	Rowling-st., i. g. r. 26s. ut. 44 yrs.	175
	22 to 264s. ut. 36s. ut. 3 yrs. g. r.	175
	20s. r. 204s.	175
	Ovington-st., i. g. r. 35s. ut. 44s.	600
	Ovington-st., i. g. r. 7s. ut. 33 yrs.	110

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Additions to Workhouse	Whitechapel Union	B. J. Capell, 70, Whitechapel-road, E.	Mar. 7
Roadmaking and Paving Works	Lewisham B. of W.	Surveyors, Town Hall, Catford, S.W. Ely. Co.	Mar. 8
Additions to Railway Station, Redfern	do.	G. W. Mills, Sec. Paddington Station, W.	do.
Two Cottages, Avenue, North, at Bristol Alterations, &c. at Workhouse, Portrack Lane	do.	J. Bodham, 16, Pimlico-st. Stockton-on-Tees Union	do.
Granite and Slag Store Premises, Dudley, near New-castle-on-Tyne	do.	Bourne (Lincs) E.D.C. C.W. Bell, Council's Office	do.
Three Cottages, Bankfield, Louth, Leics.	do.	J. G. Cronin, Archt. 50, Grange-st., Newcastle	do.
Thirteen Cottages, Penmaen-mawr, N. Wales	G. Haigh	J. Barry, Archt. 9, Queen-street, Rotherham	do.
Stables, &c. Albany road, Chorlton-cum-Hardy	Brundrit & Co.	E. Davies, Archt. Bangor A. H. Mountain, C.K. Town Hall, Wiltshire	do.
Additions to Hospital, South Worplesdon, Norfolk	U.D.C.	G. R. Jones, E.C. 3, Mid-street, Mortlake	do.
Road Materials	Barrow U.D.C.	D. Wright, Council's Office, Old Hill, Staffs.	do.
Laundry, House, at Milton-street, Leeds	Scoties (Lancs) Corp.	H. Lord, Archt. 42, John Dalton-st., Manchester	do.
Alterations, &c. Boyle Hall, Leeds	do.	Nelson & Savage, Archt. 15, Park road, Leeds	do.
Paving, Sewering, &c. Bannister-street, &c.	Stretford D.C.	Mr. Royce, Surv. Council's Office, Old Trafford, Manchester	do.
House, North Foreshore-road	Scarborough T.C.	W. E. Smith, Boro. Engr. Castle road	do.
Road Works, Apsley-road-west, &c.	Barnsley T.C.	R. E. Taylor, C.E. 8, St. Mary's-place, Barnsley	do.
Hotel, Trevelin, Mr. Trevelin is, Mon.	Messrs. Lewis	Roderick Archt. Clifton-street, Aberdeenshire	Mar. 10
Greenhouses, Sheds, &c. at Cemetery, Mitcham-road	Croydon Corp.	E. Hawley, Town Hall, Croydon	do.
Additions to Workhouse	Dunley Union	E. G. Consett, Archt. 21, Wolverhampton-st., Dudley	do.
School Chapel, Heale-st. Grimsby	do.	G. H. Evans, 164, Freeman-street, Grimsby	do.
Painting, &c. Wesleyan Church, Middlesbrough	Plymouth Corp.	Rev. S. Phillips, 3, Langland-st., Middlesbrough	do.
Chimney, &c. Electric-light Works, Prince Road	do.	F. Paxon, Engr. Municipal Office	do.
Wesleyan Chapel, Elmwell, Ipswich	do.	Edw. J. Johns, Archt. Cornhill-church, Ipswich	Mar. 11
Residence, Hipperholme, Yorks	J. F. Donald	E. Barry, Archt. Commercial-street, Halifax	Mar. 11
Two Villas, Euston, Worthington	do.	J. Donald, Archt. John-st., Worthington	do.
Additions to Schools, Dorseton	do.	Nicholson & Hartree, Archt. Bedford	do.
*Stoneware Pipe Sewers, Manholes, &c. Pumping Machinery, &c.	Broadstairs and St. Peter's U.D.C.	H. Law & Son, 11, Victoria-street, S.W.	do.
Additions, South Parade	Deal Corp.	C. G. Golden, Boro. Surv. 21, Queen-street, Deal	Mar. 14
School, Langworthy-road, Beeston	Salford Sch. Bd.	Potts, Son, & Pickup, 10, St. Salford	do.
Additions to Hospital, White Hoe Breidden, Isle of Man	Walton Sch. Bd.	T. G. Taylor, C.E. Municipal Office, Douglas	do.
Schools, Whitehall, West Bromwich	Rotherhithe Vestry	Bailey & McDonagh, Archt. Brade-street, Wallingford	do.
*Architects, Works, &c.	do.	J. J. Stokes, Vestry Hall, Lower-road, S.E.	do.
*Erection of Superstructure of Asylum with Offices, &c.	County Boro West Ham	L. Angell, Town Hall, Stratford, E.	Mar. 15
Store Buildings and House, Hirst, Aslington	Aslington Equitable Boro.	J. English, The Store Aslington, Durham	do.
Three Stone Bridges, Crook-Boroughford, &c. Westwood	Longtown B.D.C.	J. Murray, Surv. Alstonby	do.
Warehouse, North Docks Goods Yard, Liverpool	do.	H. Shelders, Archt. House, Bank, Manchester	do.
Making Up Leased road, &c. Mitcham	Taney & Yorks Ry. Co.	Surv. Council's Office, Fallowfield, Trowdon	Mar. 16
*Boundary Walls and Gates	Hackney Union Office	T. B. Cole, Union Office, Haverhill, N. H.	do.
*Workshops	do.	G. Wallis, 197, High-Holborn, W.C.	do.
*Works and Materials	St. Giles B. of W.	O. Bortwell, Town Hall, Fulham Vestry	do.
*Making-up and Paving Road	Fulham Vestry	Walton Green, S.W.	do.
Police Station, King's Norton	Worcestershire C.C.	H. Row, County Surv. Worcester	Mar. 18
School, Spring-hill, Ayrerigton	do.	H. East, Archt. Cannon-street, Ayrerigton	Mar. 19
Three Shops and Houses, What-street, Boreway Bridge, Warrington	do.	C. B. L. Horsfall & Son, Archts. Low-street-chambers, Halifax	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Road, Talgarth	Brecon and Radnor Joint Asylum	Gough & Trollope, Archts. 38, Chancery-street, S.W.	Mar. 1
Houses, Londonderry	B. Smith	W. B. Pinkerton, Archt. 5, Diamond, Londonderry	Mar. 31
*Cast Iron Water Pipes, &c.	Leigh-on-Sea U.D.C.	J. Mansergh, 5, Victoria-street, S.W.	do.
*Painting, &c. at Kennington Park and Baital Woods	Londonderry Council	Archts. Dept. Springfield, S.W.	do.
*Cast Iron Water Mains and Accessories	Leamport R.D.C.	Clark's Office, Leamport, Som.	do.
Block of Buildings	Brighton Guardians	H. B. Read, Archt. Friar-street, Brighton	Mar. 22
Street Works, Heyham-road, &c.	Southampton Corp.	W. G. Bennett, Corp. Engr. Municipal Office	do.
*Ornament of Workhouse Premises	Malling Union	J. Ladd, 7, Doughty-st. Moultonburgh, W.C.	Mar. 23
Colvert, Brampton Bryan, Salop	Wigmore E.D.C.	H. W. Bowen, Surv. Wigmore J. J. O'Connell, Archt. 124, Donegal-street, Belfast	Mar. 25
Church, Ashdowney, co. Kerry, Ireland	Rev. B. Mulholland	W. B. Wood, 12, Queen-street, Gloucester	Mar. 26
*Cottage Homes	Gloucester Union	Edginton & Summerbell, Archt. Windsor	April 2
*New Infirmary Buildings	Windsor Union	Johnston & Brierley, 39, Lower-street, Carlisle	No date
Two Villas, Dalton-road, Carlisle	St. Marylebone Gds.	T. Scott, Archt. Carlisle	do.
Shop, &c. 45, Lowther street, Carlisle	C. Walker	J. Molloy, Union Office, Carlisle-on-Solih	do.
Boundary Wall, Avenue, &c. Ballyhat	Carrick-on-Solih Union	C. Butler, Archt. 3, Quaker-street, Colchester	do.
Restoration, St. James's Church, Colchester	Harrogate Co-op. Soc.	S. Costa, Office, Albert-street, Harrogate	do.
Eight Houses, Unity-grove, Harrogate	do.	A. E. Walling, 10, Notingham-st., Ashton	do.
St. Homes, Ryecroft, Yorks	do.	Edw. J. Johns, Archt. 21, Wolverhampton-st., Dudley	do.
Assembly Hall, &c.	do.	G. H. Evans, 164, Freeman-street, Grimsby	do.
Houses, Meadow Hall-lane, Kimberley, Yorks	do.	Rev. S. Phillips, 3, Langland-st., Middlesbrough	do.
Villa, Southey-street, Nottingham	do.	F. Paxon, Engr. Municipal Office	do.
Chapel, Oswestry	do.	Edw. J. Johns, Archt. Cornhill-church, Ipswich	Mar. 11
House, at Steam Laundry, Park-road, Peterborough	do.	E. Barry, Archt. Commercial-street, Halifax	Mar. 11
*Construction Roads	do.	J. Donald, Archt. John-st., Worthington	do.
Restoration of Church, Whitgift, near Goole	do.	Nicholson & Hartree, Archt. Bedford	do.
Seven Cottages, &c. Brickyard-road, Selby	do.	H. Law & Son, 11, Victoria-street, S.W.	do.
Villas, Bangor, co. Down	do.	C. G. Golden, Boro. Surv. 21, Queen-street, Deal	Mar. 14
Bridge, Kettleby Beck, Lindsey	do.	Potts, Son, & Pickup, 10, St. Salford	do.
Business Premises, Queen-street, &c. Ramsgate	do.	T. G. Taylor, C.E. Municipal Office, Douglas	do.
Warehouse and Factory Extensions, &c. Lewisham	do.	Bailey & McDonagh, Archt. Brade-street, Wallingford	do.
Extensions at Asylum, Exminster	do.	J. J. Stokes, Vestry Hall, Lower-road, S.E.	do.
New Roads and Streets, Hasland	do.	L. Angell, Town Hall, Stratford, E.	Mar. 15
Office, Downhills	do.	J. English, The Store Aslington, Durham	do.
	do.	J. Murray, Surv. Alstonby	do.
	do.	H. Shelders, Archt. House, Bank, Manchester	do.
	do.	Surv. Council's Office, Fallowfield, Trowdon	Mar. 16
	do.	T. B. Cole, Union Office, Haverhill, N. H.	do.
	do.	G. Wallis, 197, High-Holborn, W.C.	do.
	do.	O. Bortwell, Town Hall, Fulham Vestry	do.
	do.	Walton Green, S.W.	do.
	do.	H. Row, County Surv. Worcester	Mar. 18
	do.	H. East, Archt. Cannon-street, Ayrerigton	Mar. 19
	do.	C. B. L. Horsfall & Son, Archts. Low-street-chambers, Halifax	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works	Wimborne U.D.C.	110s. rising to 160s. per an.	Mar. 14
*Surveyor	Mognathair C.C.	do.	Mar. 16
*Clerk of Works	Carlisle Corp.	do.	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. — Contracts, pp. iv, vi, vii, & ix. Public Appointments, pp. xix & xxi.

22, Whitehead's-grove and 10a, College-st., r. 10s. 6d. and 1 g. 10d., u.t. to 72s. g. 4d.	£510	February 17.—By FULLER, MOON & FULLER (at Croydon).	31 and 41, Harker-st., r. 66s. also 1 g. 20d., u.t. 46 yrs. g. 47s. with reversion to other property	£800
Camberwell.—Hardest-st., f.g. 94, reversion in 60 yrs.	255	Croydon.—9, 11, and 13, Cromwell-rd., and 16 to 26 (even) Devonshire-rd., f. r. 16s.	Old Ford.—Roman-rd., f.g. 24, reversion in 48 yrs.	800
Wimbleton.—Tabor-grove, f.g. 21s. reversion in 60 yrs.	615	42 to 32 (even), Lower Addison-rd., f. r. 10s. 6d.	Parnell-rd., f.g. 94, reversion in 57 yrs.	800
Plaieston.—Plaieston-rd., f.g. 27s. reversion in 71 yrs.	710	Mitcham.—Upper Green, two freehold shops and cottage, with yard, stabling, &c., r. 60s. 2s.	Hammersmith.—Blythe-rd., f.g. 36s. reversion in 61 yrs.	1,675
Surbiton.—3 and 4, The Pavement, u.t. 80 yrs. g. 30s. f. r. 20s.	2,440	Cheapside.—Queen-st. "The Golden Fleece" p-h, f.g. 110s. reversion in 59 yrs.	Blythe-rd., &c., "Old Parr's Head" p-h, f.g. 7s. reversion in 61 yrs.	790
By DEBENHAM, TEWSON, & Co.		Kennington.—61, Kennington Park-rd., with timber and dairyman's yards in rear, u.t. 12 yrs. g. 32s. 10s. f. r. 13s. 10s.	Spangborough-rd., f.g. 45s. reversion in 64 yrs.	210
Wimbleton.—Haydon's-rd., &c., a plot of building land, f. 6s. 8d. to 12s. 6d. and 30 to 74 (even).	140	50, 52, and 54, Albert-st., u.t. 53 yrs. g. 15s. 8d.	By CHARLES ATKINS.	
Cromwell-rd., u.t. 91 yrs. g. 20s. 10s. r. 95s.	8,070	84s.	570 Bromley, Kent.—Addison-rd., f.g. 12s. reversion in 60 yrs.	1,315
76, 88 to 120 (even), Cromwell-rd., f. r. 540s.	8,060	Albert-st., f.g. 24s. u.t. 53 yrs. g. 79 yrs.	Lewisham.—10, 12, and 14, Court Hill-rd., u.t. 69 yrs.	3,420
61 to 101 (odd), Cromwell-rd., f. r. 60s.	9,160	Albert-st., f.g. 10s. u.t. 46 yrs. g. nil	20, 22, 24, and 26, Court Hill-rd., u.t. 69 yrs.	760
3 to 61 (odd), Cromwell-rd., u.t. 91 yrs. g. 10s. f. r. 910s.		By H. J. BLISS & SONS.	17, Higher Green-lane, a freehold block buildings and land, r. 70s. 6s.	740
276 to 288 (even), Haydon's-rd., u.t. 91 yrs. g. 70s. f. r. 28s.	2,510	Hackney.—8, Pembroke-rd., u.t. 74 yrs. g. 67s. 6s.	Forest Hill.—30s. Stanstead-rd., f. r. 56s.	375
290, Haydon's-rd., u.t. 91 yrs. g. 15s. f. r. 55s.	530	Kingsland.—31 and 33, Dunton-rd., f. r. 32s.	Chiswick.—54, Woodstock-rd., u.t. 78 yrs. g. 14s. r. 50s.	650
292 to 308 (even), Haydon's-rd., u.t. 91 yrs. g. 90s. f. r. 40s.	4,680	New Southgate.—1 and 3, Acadia-villas, f. r. 32s.	By E. R. SMITH.	
Haydon Park-rd., a plot of land, 28 p. f. 10 to 36 (even), Haydon Park-rd., u.t. 91 yrs. g. 90s. f. r. 40s.	3,020	St. George's East.—46 and 48, Red Lion-st., u.t. 41 yrs.	Gray's Inn-rd.—50 and 52, Britannia-st., f. r. 104s.	810
40 to 74 (even), Haydon Park-rd., u.t. 91 yrs. g. 110s. f. r. 55s.	3,700	By HUNTER & HUNTER.	25, 27, 29, and 31, Court Hill-rd., u.t. 69 yrs.	675
3 to 21 (odd), Haydon Park-rd., f. r. 150s.	2,360	Horselydown.—30 to 42 (even), Lafone-st., u.t. 124 yrs. g. 35s. f. r. 17s.	February 19.—By J. THORNBOROUGH (at Butter Knowle).	
23 to 47 (odd), and 53 and 57, Haydon Park-rd., u.t. 91 yrs. g. 140s. f. r. 60s.	4,750	Fulham.—14, Archel-rd., u.t. 79 yrs. g. 8s.	Butter Knowle, Durham.—"Foster House Farm," 8 a. 2 r. 16 p. c.	490
Haydon's-rd., &c., a corner plot of land, 33 p. f. 3 to 36, Caprd., u.t. 91 yrs. g. 23s. 6d. f. r. 10s.	7,300	Kilburn.—3, 5, 11, and 13, Princess-rd., u.t. 60 and 64 yrs. g. 24s. f. r. 134s.	Enclosure of land, &c. 50 p. c. 10 a. 2 r. 16 p. c.	1,300
Avondale-rd., &c., enclosure of building land, 7 a. 3 r. 12 p. f.	5,500	Camden Town.—Great College-st., f. r. 12s. 10s. u.t. 41 yrs.	February 21.—By PERCIVAL HODSON.	
By N. EASTON & SON (at Hull).		Kensington.—Warwick-rd., f.g. 21s. u.t. 404 yrs. g. nil	Crouch Hill.—18 and 20, Blythwood-rd., f. e. r. 10s.	
Mapleton, &c., Yorks.—"The Mapleton Estate," 69 a. 3 r. 36 p. f., with the Manor of Mapleton	14,000	By MATTHEW MILES.	Mile End.—25, 26, and 27, Maidman-st., u.t. 45 yrs. g. 12s.	420
		Battersea.—51 and 53, St. John's-rd., and the "Buck's Head" p-h, f. r. 37s.	3, Ewing-st., u.t. 77 yrs. g. 5s. 5s.	265
		By J. H. HIBBARD.		
		Chelsea.—Harker-st., f.g. 139s. u.t. 30 to 46 yrs.		

TENDERS.

£1.520

725

300

27,500

850
510

1,350

950

175
185

380

175

370

12,200

420

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LONDON.—For alterations and additions to the "Bell" public-house, Wandsworth-road, S.W. for Messrs. Barclay, Perkins, & Co., Limited. Mr. Geo. Hubbard, architect, 23, Finsbury-circus, E.C.4.—

Wall & Co.	£2,700	Turtle & Appleton	£1,030
Balkan Bros.	5,057	W. Nash, Crown Works,	1,891
Corbin & Sons	2,057	New Cross, S.E.1.	
J. C. Richards	2,035		* Accepted.

LONDON.—Accepted for alterations and improvements to 72, Acton-street, Gray's Inn-road, for the Amalgamated Society of Railway Servants. Messrs. Goddard & Crossall, architects, Colchester.—

General Builders, 15, Southampton-row	£1,670
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LONDON.—For alterations and repairs at 55, Jermyn-street, Mr. S. Skrimshire, architect.—

Charles Brown & Son	£517
Waberton & Golding	537

MACCLESFIELD.—For the execution of sewerage works, Poynton, for the Rural District Council. Mr. J. Thorpe, surveyor, 19, King Edward-street, Macclesfield. Quantities by surveyor:—

T. & W. Meadows	£5,585	A. Taylor	£4,475
W. Underwood & Bros.	5,113	J. Randall	4,475
A. Kellert	4,795	F. Barke, Stoke-on-Trent	4,075
M. Hall & Sons	4,754		
J. Slinger & Sons	4,599		* Accepted.

MACROOM (Ireland).—For the erection of drying-chamber at the workhouse, for the Union Guardians. Mr. A. W. Hamard, C.E.—

W. Coughlan	£140	Perrett & Co., Cork	£133
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[Contract adjudged for six months.]

NEATH (Wales).—For the erection of schools, Goolt Park-road, for the School Board. Mr. J. Cook Rees, architect, St. Thomas-chambers, Neath. Quantities by architect:—

Howells Bros.	£11,550	W. Jones & Johns	£11,550
Morgan Cox	11,550	A. George	11,551
W. Jones Williams	11,550	Wm. Daniel	11,000
O. E. Davies	11,550	John Rees	10,999
Henry Billings	11,550	D. Jenkins	10,999
Thomas Walkim	11,551	J. Davies	10,612
Edward Green	11,150	C. & F. Galt, Port Talbot	10,530
Burnett Bros.	11,150		

* Accepted subject to the approval of the Local Government Board.

NORTHAMPTON.—For laying two miles water main, for the Rural District Council. Mr. W. Hall, engineer, 12, St. Giles-street, Northampton. Quantities by engineer:—

H. Evans	£1,150 0 0	Higgins	£985 0 0
Jenkinson & Son	1,155 0 0	Geo. Fisher	975 0 0
R. Martin	1,285 0 0	Wingrove & Stanley	974 0 0
W. Smart	1,075 0 0	H. A. Lee	968 0 0
E. Conford	1,075 0 0	E. Clarke, Northampton	938 0 0
Branson & Son	1,038 0 0	105	

* Accepted subject to the approval of the Local Government Board.

PLYMOUTH.—For the erection of blocks of dwelling-houses, Howe-street, &c., for the Corporation. Mr. J. Paton, Borough Engineer, Municipal Offices, Plymouth.—

Shellass & Son	£19,800	A. N. Coles	£17,715
J. F. Skinner	18,810	W. E. Blake	16,717
T. May	18,780	W. Trevena	16,500
Pettice Bros.	18,475	Wakeham Bros.	16,159
Goad & Co.	18,475		* Accepted.

[All of Plymouth.]

PONTEFRAC.—For additions to club premises, for the Conservative Club Committee. Messrs. Greaves & Sidebottom, C.E., Ropergate-chambers, Pontefract.—

George Spur	£1,155	H. Wright, Pontefract	£1,345
E. Wray	485		* Accepted.

PRESTON.—For erecting a new school, and for extensions to present buildings, Royal Cross School. Messrs. Sames & Green, architects, 65, North-croft, Blackburn.—

John Christian, Preston	£3,450
M. Shorrocks	£3,570

* Accepted.

PRESTON.—For erecting a new sanatorium, Royal Cross school, Preston. Messrs. Sames & Green, architects, 65, North-croft, Blackburn.—

John Christian, Preston	£3,450
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* Accepted out of five tenders.

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RUSHDEN (Northamptonshire).—For erecting seven cottages, Oswald-street, Rushden. Mr. Arthur Gamat, architect, 66, Oak-hurst-grove, East Dulwich, London, S.E.1.—

C. E. Bayes	£1,300 0 0
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[No competition.]

ST. ALBANS.—For erecting a villa, Aetna-road, for Mrs. Alamy. Mr. Percival C. Blow, architect, 7, London-road, St. Albans.—

J. & W. Savage	£500	Bushe	£454
E. Dunham	395 0 0		

* Accepted subject to slight modification.

SOUTH SHIELDS.—For rebuilding the "Britannia" Hotel, Charlotte-terrace, for Messrs. J. Rowell & Son, Ltd. Mr. J. W. Donald, architect, Russell-chambers, South Shields. Quantities by Mr. J. P. Allen, Newcastle:—

J. & W. Lowry	£4,378 0 0	W. B. Ingram	£3,808 5 7
N. W. Hughes	4,085 10 9	W. H. Brown	3,606 14 5
J. C. Hoag	3,995 1 0	S. Shariff	3,695 0 0
J. Moore	3,653 0 0	K. Harper	3,645 4 8
W. Christie	3,489 0 0	R. Allison, Whitburn	3,368 0 0

* Accepted.

WALTHAMSTOW.—For building schools at Brummer-road, Walthamstow. Messrs. J. & K. Cuts, architects:—

Morris	£2,487	Shummu	£1,132
Forster	2,399	Bentley	2,195
Lawrence	2,215	Scott	1,997
Fuller	2,181		

WEST BRIDGFORD (Notts.).—For the execution of paving works, &c., for the Urban District Council. Mr. W. Pare, C.E., Bridge-grove, West Bridgford. Quantities by the Surveyor:—

J. H. Vickers	£1,315 15 0	Cox & Son	£1,041 19 11
Cope & Raynor	1,214 0 0	Bower Bros. Maidford	1,000 0 0
J. Barry	1,010 0 0		* Accepted conditionally.

WIMBLEDON.—For the erection of electric light station at Wimbledon. Mr. A. H. Prescoe, engineer:—

Verbury & Co.	£3,984	Lorden & Sons	£3,333
Bulled & Co.	3,978	Thomas & Edge	3,864
Wall & Co.	3,578	Minter & Co.	2,990
Jas. Burges	3,388		

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VOL. LXXXV. No. 2875.

MARCH 12, 1898.

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Villa Medici, Rome	Single-Page Ink-Photo.
Cortile of Palazzo Marino, Milan	Single-Page Ink-Photo.
Manzoni Palace, Venice	Single-Page Ink-Photo.
Church of San Zaccaria, Venice	Single-Page Ink-Photo.
Examples of Renaissance Monuments	Double-Page Ink-Photo.

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The Recent County Council Election.

THE recent election for the London County Council has been, of course, the subject of discussion in the daily Press. It is too important, however, for it to be passed without some notice in these columns. The result, as every one knows, has been to give more seats for the Progressive party, this, to a large extent, is owing to the defeat of the present Unionist Government. They made the serious mistake of founding Imperial and Municipal politics, the members of the Cabinet went about doing making speeches as if upon the result of the election depended the fate of the Cabinet. It is one thing for a citizen of London to be in favour of the continued union of England and Ireland, and of the extension of the Empire, and quite another to desire to retain the water supply in the hands of private companies and the lighting in the power of the Vestries. Again, the politicians who were imported into the con- by the Moderates made another serious mistake — they called the Progressives "Socialists." The Progressive party have made serious mistakes; but the workingmen of London, the artisan and the tradesman, look to the Progressive party to make their life more easy in many ways, as by municipal tramways as a means of locomotion, and by doing much in the way of parks and gardens. Even in regard to such a question as betterment, the elector has an idea that he is being taken care of, and, moreover, the very word "Progressive" signifies that the Party endeavour to move on, and no one can expect that movement in regard to London is arrested. The result, therefore, can have no surprise to those who watched the contest dispassionately. It is an unsatisfactory contest, because such points as the effect of the Works Department, the influence on betterment to the loss of improvements, did not really come much into the elector's mind. Nor, indeed, can questions

of detail ever, in a huge place like London, much affect elections, for the voters will seek for broad issues, and the Government by its suggested attack on the County Council gave many voters this issue,—were they to protect the County Council or not? and the majority have desired that it should be protected.

What, then, is, so far as it is possible to foresee, the practical result of the election as regards the future? It seems probable that things will go on for the next three years much as they have lately done. The Progressives will endeavour to get the water supply of London under the control of the County Council, and, since the electorate of London has practically affirmed this policy, we are inclined to think that the Government will be acting wisely in endeavouring to bring in some measure to this effect. We have never concealed the opinion that the water supply should be managed by a special public body. It is becoming obvious, however, that a dangerous delay must ensue unless it is handed over to the County Council. The Works Department will probably be allowed to continue its work in peace: the practical criticism of the details of its business with full knowledge is the surest way to keep it in order. As regards improvements generally, it may be that the new Council will endeavour to put "fads" on one side, and carry out many improvements which are so urgently needed. The traffic of London in the streets urgently demands attention. The increase of tramways is desirable. London is behind every other town in the world in this respect.

There is another thing to be said. The public has seen various foolish acts done by the Progressive party in the recent Council. It hardly takes the same notice of the large amount of small useful and detailed work which has been performed. It is not wise to criticise too severely the errors of a party, which a public Press almost always unduly magnifies. The London ratepayer has put the Progressive party into power for the new term of the Council, and we can only hope that that party will eschew politics and endeavour to do some really good practical work for the benefit of the whole of the metropolis.

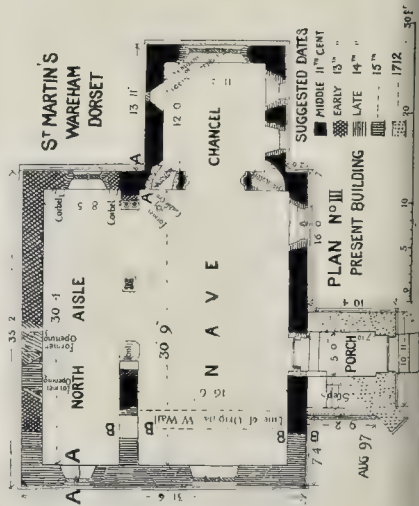
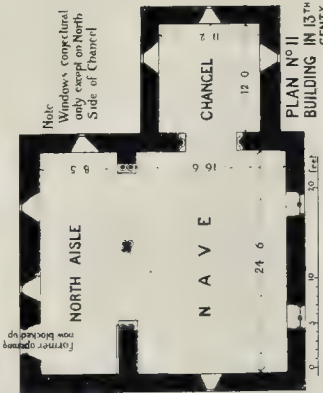
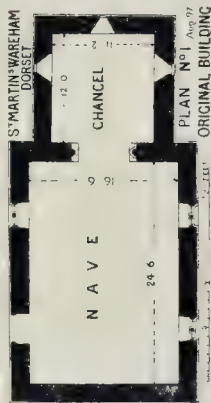
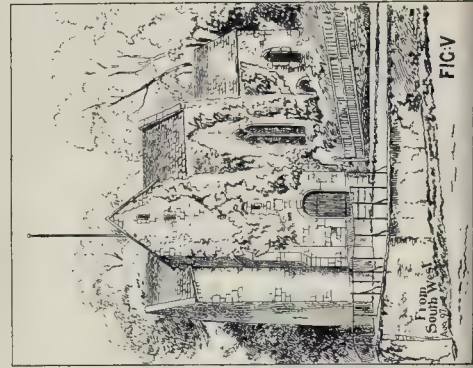
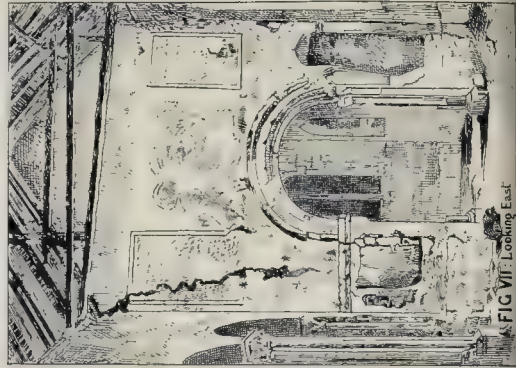
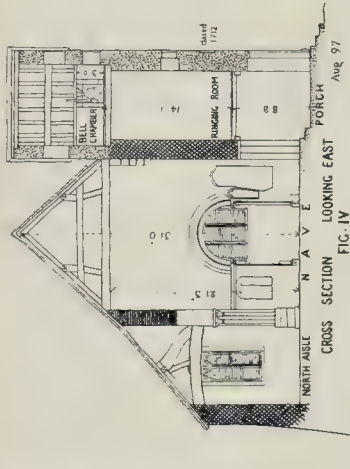
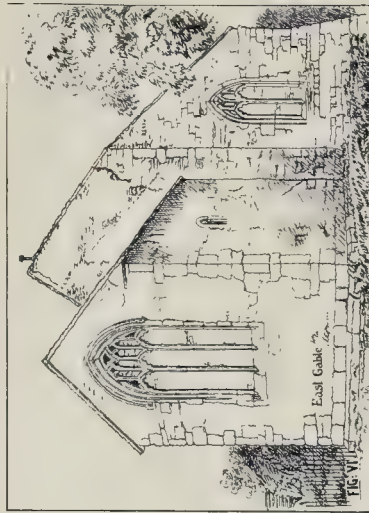
THE CHURCH OF ST. MARTIN, WAREHAM, DORSET.

BY MR. CHARLES LYNAM, F.S.A.

THE visit of the Royal Archaeological Institute last year was the incentive to a study of the details of this church, resulting in this attempt to illustrate and describe them.

The little town of Wareham is of exceptional interest, both to the antiquary and architect. It lies on rising ground between two rivers, which bound it on the north and south sides. Its site is a square, enclosed on the south side by the River Frome, and on the three other sides by a great wall of earth with an inner and outer ditch. Its main streets run through the middle of the square in different directions and at right angles to one another. In the south-east quarter is the Priory Church and quay, representing a fine group of buildings from the north-east, and possessing many features of great interest. In the south-west quarter is the small Church of the Holy Trinity and the Castle Mound. In the north-east quarter stands the little Church of St. Martin. Throughout the town there is an absence of early Mediæval work except in the churches, but there are many examples of simple domestic buildings of Queen Anne's time and onwards. In South-street is an exceptionally fine example of an unpretentious town house. It is a town where the architectural student may spend two or three days with profitable study of the simple detail of the early part of the last century.

The first sight of the Church of St. Martin from the south is extremely impressive in its exceptionally picturesque character; to this its peculiar situation lends its aid. Standing almost upon the edge of a deep cutting in the road, which bounds its site on the west, and down which lower buildings are seen, backed on the north by well-grown trees; its small area but high altitude, with its gabled south porch rising as high as the church itself; its touch of ivy and grey walls and roofs, produce a picture not often presented in so small a building. The general effect of the exterior is equalled by that of the interior. Its high walls; a north arcade of two bays; a chancel arch flanked by an opening on each



the remains of post-Reformation texts; the earlier frescoes painted on the white-washed facings; the barn-like roof, the rivets in the walls, and the floor of sand, together with a general air of forsaken neglect, give to the place a very extraordinary and interesting effect. The architecture is of varying dates, the earliest being placed by competent authority as far back as the Saxon period, whilst the south porch, which lends little to the exterior design, is inscribed as the time of Queen Anne. It is the main object of these lines to attempt to elucidate whether or not the original parts of this building may with certainty be attributed to pre-Conquest date.

The shortest method of describing the church will be by making reference to the accompanying illustrations, first of all observing that there are three distinct buildings clearly marked out in the work itself. Plan No. 1 shows the original church, consisting entirely of nave and chancel, with a north doorway (indications of which still remain), and an early window on the north side of the chancel, and the chancel arch together with the chancel walls and part of the walls of the nave. There is evidence of the position of the doorway shown on this plan, but the windows except on the north side of the chancel, are conjectural only. Plan No. 2 shows the church after the first enlargement, which consisted only of a north aisle of two bays. There is existing evidence of the date and of the position of a north doorway, but the windows are conjectural only. Plan No. 3 gives the church as it at present exists, the nave and north aisle having been lengthened westward, and the porch (a *basilica*-tower) making a further considerable addition. Sundry minor alterations were also introduced, including in the chancel the three-light window at the east end, the west's doorway, and also an opening, now boarded up, in its south flank; a two-light window in the south wall of the nave; also a two-light window in the east gable of the north aisle with an altar bracket on each side of it; also the windows at the east end.

With regard to the dates of these several enlargements, to a great extent the work speaks plainly for itself. Plan No. 3 shows the distinctions of dates, from which it will be seen that the original church is ascribed to the middle of the eleventh century. The north aisle was of the date of the beginning of the thirteenth century. The extension at the west end of the nave and aisle is of the Tudor period. The great three-storied porch is twice dated 1712. The south windows of the nave and chancel are of the thirteenth century, and also the priest's doorway. The east windows of the chancel and aisle are of the fifteenth century. This plan particularly exhibits how little remains of the original church, but there that little is, and it must be said that the keynote (of proportion, at all events) of all that has been done since, has been forced by the main characteristic of the first church—namely, its extreme height in proportion to its width—the walls of the nave being 21 ft. high and the width 16 ft. 6 in.; those of the chancel 11 ft. high, while its width is only 11 ft.

A cross section looking east is given in fig. 4. In fig. 5 is sketched a general view of the exterior from the south-west, indicating the situation in respect of the highway, &c. Fig. 6 shows the eastern gables and

marks the "long and short" quoins at the angles.

Fig. 7 is an interior view looking east, giving the chancel arch and showing the ruthless manner in which this wall has been treated from time to time. Here it may be noticed that the walls of the interior are, for the most part, covered with post-Reformation Scriptural texts, and that where, in earlier times, a stirring representation of the Last Judgment would appear, the Royal Arms are conspicuous, along with the Creed and the Ten Commandments. Here and there fragments of earlier colour decoration appear. Fig. 17 shows the original thirteenth-century base to the shaft of the aisle bays, and also the present later base. Fig. 18 represents the present terminal of the west gable of the nave, and it will be seen at once that this is a reproduction of the stone now lying near to the chancel arch and sometimes described as a Holy Water Stoup.

In the south gable of the porch is a sunk and moulded panel, 18 in. square, bearing the following inscription—viz.:

Richard Coole.

Edward Benet.

Church Ward,

Ans: 1712.

In the same wall, on one of the building stones, in line with the top small light, is cut "John Morton, an: 1712."

There is one bell hung in the upper floor of the porch, 1 ft. 10½ in. in diameter, and 1 ft. 5½ in. high, lettered as follows: "Clement Tosiear cast me in the year of 1698." There is a shield at the beginning and between the Christian and surname and after the latter.

Fig. 8 is an interior sketch of the west respond with the original north wall, showing the remains of early work hereafter more particularly described. The central point of interest in the fabric lies in the question whether the parts of the first church now remaining are of Saxon design and workmanship. Competent authorities say "Yes," others affirm the contrary. So the field of inquiry remains open for those desirous of considering this debatable point carefully. It must be frankly admitted at the outset that there is a certain amount of evidence for both views, and that a positive decision is perhaps scarcely to be arrived at. That the remains of the first church are of the middle of the eleventh century no one can reasonably doubt. Its diminutive area, excessive proportion of height to width, extreme simplicity of its parts, walls having no trace of a buttress, with a plain chamfered base, the footings showing above ground, the quoins at the angles formed of "long and short" work, the masonry built of rubble only, the only remaining window (that on the north side of chancel) being small in dimension and having its glass face close to the outside, being set back only to the extent of a small chamfer on the arrises all round—these are points almost justifying the conclusion of a pre-Norman date for the early church; but above all this there is fragmentary evidence on the north side of the west respond pier of the present aisle (see fig. 9) which more than supports the other items in favour of its early date. Near this pier is to be seen not only the original outside chamfered base of the wall, but the impost of a north doorway, with the springing line 6 ft. 6 in. high from the top of the plinth. Above this impost is the lower vousoir of an arch and a short

length of a hood mould, and above this again a short length of a string course bevelled on the top, on which rests an upright stone or jamb capped by another impost, suggesting an arched opening, either of arcade or window. Fig. 9 shows these features in detail. Fig. 10 gives roughly what is in existence on the north side of the early church at Worth, in Sussex. It can hardly be doubted that the two examples at this point are of about the same date, the features here referred to being well-nigh identical. After this statement it may, perhaps, be asked what further can be said in favour of a Saxon date for the original church. Perhaps it is squeamish to go further in the matter; yet there are a few points, which by the careful observer will not be unnoticed. First of all, the long and short work at the quoins of the eastern angles of the chancel and nave are not altogether absolute in their character as "long and short work." See fig. 6, and also in this connexion fig. 16. Then the little window on the north side of the chancel might very well take its place in a post-Conquest building (see fig. 11); and further, the dimensions, the details, and the proportion of the chancel arch (see fig. 12) would not be out of place in a Norman structure. Here is a feature of refined architecture, and is free from anything else like a "primitive Romanesque" design. Let it be compared with Bradford, Escombe (fig. 14), or even with Worth or Bosham, and it will be seen that the observation here noted strictly holds good. It is true that the absence of cap beyond a simple impost does not generally betoken Norman work where accompanied by an arch of this importance; but it is common enough in ruder examples. Then, both in the chancel arch (see fig. 12) and in the remains of the north doorway (see fig. 9), the usual pilaster strips are altogether absent. See also the Saxon remains of a doorway at Sherborne Minster, not far from Wareham (fig. 13).

There is a complete little church of unmistakable Norman origin known as "The Heath," near to Ludlow, in Salop (plan No. 15) which, in general design, cannot be far removed from this at Wareham; yet there are distinctions which are decidedly in favour of precedence for this St. Martin's, but the time of erection between the two can only be very short. In the Norman example at "The Heath," Salop, the jambs have nook shafts, whilst Wareham has a single soffit shaft; but on each side of it there is a square nook member, and the notion of showing a best side to the nave exists in both examples; this applies at Wareham only to the arch where the square nook moulding is not carried round the arch on the east side as it is on the west. It was a dictum of Pugin's that the mediæval designer did not know what "a front" meant; but certainly the Normans did, as may be seen in these and many other examples. A soffit shaft, with arch, is common in Norman work but not in Saxon. That the church at Wareham is on the border line few will gainsay, and after the review here given perhaps it may be said he is a courageous antiquary who positively ventures to express an opinion in favour of one side of 1066 or the other for the whole of the church. Perhaps, taken altogether, the balance inclines towards the Norman rather than the Saxon period. Otherwise

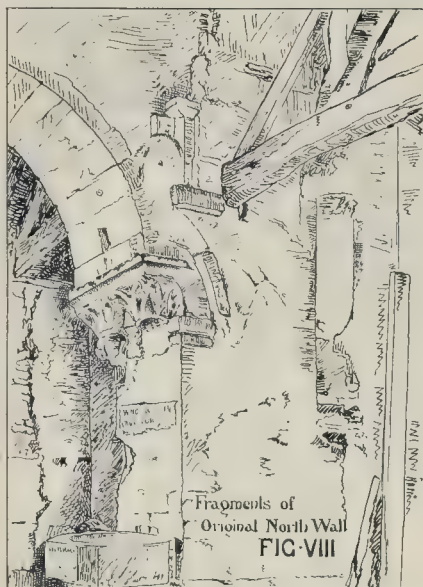
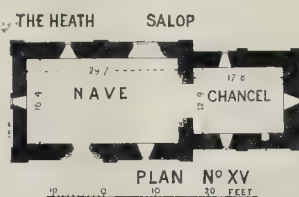
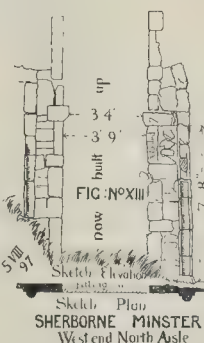
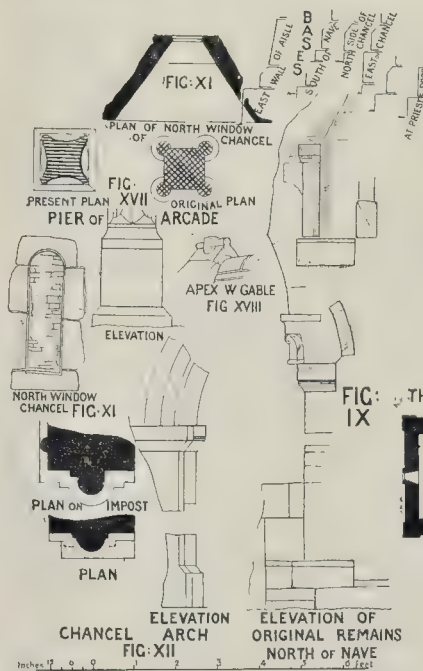


FIG. X



the Saxon work at Barton-on-Humber (see fig. 16), Stanton Lacy, Dilbury, Barnack, and elsewhere, does not represent the same school, or, if it does, it must be of a much earlier date. Nor does the early Norman work at Canterbury, Winchester, and Worcester represent the beginning of the period to which they belong. If the chancel arch and the north window of the chancel at Wareham are allowed to be Norman, then the walling and remains of the north door-

way might be accepted as Saxon, very late in that period.

No one can look at the plan of this church marked No. 3, and not see how woefully the original building has been dealt with; nor can any one wonder that the walls are riven with cracks. In the chancel the east end has been broken away for a large window, and on the south flank a doorway and window have been broken out, whilst on each side of the chancel arch considerable

openings have been made without regard to any risks that might follow. In the nave a big south window has been put in near to the angle of the wall, and a doorway opened out. The west wall has been entirely taken away, and the north wall largely pierced for an arcade of two bays: the western end on the north side has been cleared away for a large opening between the nave and aisle. The wonder is that any part of the nave remains to this day. Both inside and out-

the building there is much dilapidation. It has been said locally that the serious part is due to the lowering of the roadway at the west end of the church, but a critical examination of this point shows that this is not the case, as the west wall through perfectly upright and shows no sign of sagging in any degree gone towards the end of the road. Then again the most serious cracks in the walls are those at the end of the north aisle, and in the east wall of the nave as indicated on Plan III. at These are in the contrary direction of any action operating from the road. Only there are openings through the walls near to the west end at BB, on Plan II., in the line in which movement of the west wall might cause, but it is perfectly clear that these cracks have originated in the loss of bond at the time the west end of the church was extended. It is also apparent that the ugly crack in the east wall of the church between its north wall and the north wall of the chancel, originated in the contraction of the north aisle, due care not having been taken to keep the north-east wall of the nave wall intact. There are many open cracks of less importance in the walls, and the internal plaster is loose, cracked, and broken, which increases the appearance of general dilapidation. A Churchwarden remarked to me that it had been suggested as a remedy to underpin the west wall, and to dig it down to beneath the level of the roadway. At first sight this would seem to be a reasonable suggestion; but if the foundations before made are correct, there is no need for such an expensive remedy, indeed, it would be out of place. The insertion of iron ties through the wall, from east to west and north to south in positions that would not interfere with the interest of the building or its fitness, would make the fabric secure for generations to come, without in any way adding or adding to it, and at a comparatively small outlay. Of course, cracks would require filling in addition to the ties or bolts. In any case this ancient and very interesting structure might continue to be the delight of the antiquary, architect, and artist. If the walls were concreted, occasional services might still carry on the long-established tradition still possible within its walls. How picturesque the present state of things is, the churchman cannot but lament the lack of the continued sacred use of the noble church. Nor can the antiquary or look with unconcern on the threatening decay which dilapidation too plainly bears.

C. LYNAM.

NOTES.

On Friday last week some questions were asked in the House in regard to the new Municipal Offices, and we learned from the First Commissioner of Works that it was the intention of the Government at once to proceed, on the lines of the Report of the Committee of last Session, with the erection of the War Office and the Parliament Street offices. In reply to a question as to how the choice of designs was made, the First Commissioner said that the Government had not got as far as that yet. But he added that the Government were in hopes of producing buildings than the existing public

buildings of London, and more in keeping with the other buildings in Whitehall. "The art displayed in the new Admiralty buildings and in the new Scotland Yard was not, in his opinion, worthy of the positions which it occupied." It appears therefore that the First Commissioner of Works, who is the responsible official for the architectural work of the Government, groups together under one banner the new Admiralty, which as far as architectural design goes is the worst public building ever erected in this country, and Mr. Norman Shaw's Scotland Yard building, one of the most characteristic and picturesque public buildings in the country, which has been the admiration of architects and artists ever since its erection! Mr. Akers-Douglas we have no doubt means well, but apparently he is absolutely unconscious of the difference between a building which is a work of art and one which is not. After this, the cause of official architecture seems hopeless.

WHEN, on the death of Mr. Pearson, Mr. Bodley was appointed architectural adviser to the Dean and Chapter of Peterborough, it was evidently supposed by the "anti-scrape" party that now they were going to have their ideas carried out; Mr. Bodley belonged to a different school from Mr. Pearson, and one of the critics who had been most prominent in throwing stones at Mr. Pearson observed complacently that "this was a better appointment than had been expected." And what is the result? Mr. Bodley has recommended just the same course for the south gable which Mr. Pearson recommended for the north one, viz.: taking it down and re-setting it, and for just the same reason, that the masonry in the rear of the gable is in such a state that he thinks no method of strengthening the wall here is practically possible. It will be interesting to see whether the gentlemen who hurled anathemas at Mr. Pearson for giving the only practical advice possible under the circumstances will proceed to pay the same kind of compliments to Mr. Bodley, whom they have hitherto regarded as an ally.

AMID the wholesale mischief wrought by Lord Grimthorpe at St. Alban's Cathedral, the unique central tower has hitherto been spared, but a hand has now been laid on that also. The battlements on the south side have been taken down and are being rebuilt, and it may be presumed the same fate awaits those on the other three sides. After the greater reconstructions this may seem hardly worthy of protest, especially since it is excused on the ground that the old brickwork is decayed and in danger of falling. But everything depends upon how a work of the kind, when it becomes necessary, is done; and far from having any confidence that good taste and feeling and reverence will be displayed in the reconstruction, we can only judge from the past that they will be conspicuous by their absence, and that a further disfigurement is likely to be added to this once interesting structure. The protests of architects against the proceedings of his lordship are no doubt discounted by the public, who probably suspect that professional jealousy may have something to do with them. Is it too much to hope that, even at this eleventh hour, some

of those enthusiastic amateurs whose indignation boiled when the most skilful and conservative of restorers presumed to touch the west front of Peterborough, may be able to make the public understand what has been done and may yet be done at St. Albans? It is rumoured that a new roof is to be put on the tower. That may not mean any harm; but suppose a high-pitched roof is intended!

At the last meeting of the "Old Paris" Committee, "Commission de Vieux Paris" it was decided to have a plan made showing the natural contour of the ground at the Gallo-Roman epoch, as a preparation for studying the successive developments of the city, and on this plan are to be drawn out also the lines of Roman roads still existing in the Department of the Seine. It was also decided that in future the Municipal Administration should submit to the Committee every project for new streets, before commencing them. The Committee also discussed the question of the acquisition of the ancient Hôtel de Sens, one of the most interesting examples of civil architecture of the Middle Ages.

THE fifteenth Annual Report of the Metropolitan Association of Public Gardens of this Association records, as the work which it has succeeded in carrying out during the year 1897, the laying out of three new gardens; provision of gymnastic apparatus for one playground; drinking fountains placed on three sites; seats placed in twelve localities; trees planted in three places; and assistance given in the preservation, acquisition, or improvement of thirteen open spaces. Among other things we are glad to see that a "Drinking Fountain Designs Committee" has been formed, the Association having felt (and rightly) that there was great room for improvement in the designs of street fountains; and prizes of 15*l.* and 10*l.* have been offered for suitable designs for fountains in durable materials to cost not more than 100*l.* and 50*l.* (including their erection). The competition was closed on November 15, and twelve competitors sent in drawings, which are under the consideration of the committee, with the assistance of the advice of Mr. Alma Tadema. The report gives a long list of open spaces which the Association is endeavouring to secure, and of other work in hand, in which it is to be hoped it will be successful. It is a curious indication of the habitual indifference in the present day as to the beauty and healthfulness of cities, that such an Association should be necessary; but we must take things as we find them, and be grateful to those who endeavour to mend them.

AN eminent electrician recently advocated that the main fuse of the electric wiring of a building should have a greater margin of safety than fifty per cent. He says that the function of the main fuse is to prevent fires from the overheating of the house mains, owing to an accidental short circuit between them. Now this is an extremely rare occurrence, but yet the main fuse has a notorious habit of breaking the circuit and putting out all the lights at inconvenient times. The reason of this is apparently that the difference of expansion between the metal alloy of the fuse and the iron or brass nuts clamping it gradually squeezes the wire out, and the

ecture in
ament.

Electric
Fuses.

heating due to the increased resistance of the contacts melts the wire. There is no more frequent accident in electric lighting than this, and it has prejudiced many against the electric light as being untrustworthy. The electricians, however, who are recommending that the main fuse should have a margin of safety of 300 or 500 per cent. seem to us to be recommending too drastic a remedy. The main fuse not only guards against short circuits between the mains to the distributing-board, but also against the much more frequently occurring short circuit between them or the meter and "earth." A main will generally take fifty per cent. more current without dangerous overheating, but it will rarely take a hundred per cent., and so the risk of fire would be greatly increased. We think that fifty per cent. is a very generous margin. The true remedy is to use proper clip fuses, and so guard against the differential action due to the different co-efficients of expansion by heat of the fuse wire and the nuts clamping it.

Changes in
Holborn.

We have lately adverted to the demolition of the "Old Bell," and to the alterations that are being made at what was Anderson's, or the "Black Swan," Distillery.* Further changes are taking place, and will quite transform the character of the thoroughfare's northern side. The premises of a company of outfitters, between the site of the "Old Bell" and Leather-lane, are in course of reconstruction by Mr. J. Carmichael, after the designs of Mr. Joseph Sawyer. The two old houses at the opposite corner of Leather-lane, Nos. 129 and 131, Holborn, distinguished by the square bays of their first and second floors, will shortly give way to an extension of the adjoining "Ridder's" hotel. Then next, westwards, is the front block of Furnival's Inn, built in 1818-9 after Henry Peto's designs. That block is now vacated, and the site, we are informed, has been taken for a further extension of their premises by the Prudential Assurance Company, to be built by Messrs. Holland & Hannen, contractors; the company's architect is Mr. Alfred Waterhouse, R.A. For an extension of their offices, the Prudential acquired from Lincoln's Inn, three years ago, "Woods'" hotel, along the north side of Furnival's Inn, so that, with the demolitions now in progress there, the Inn will soon entirely cease to exist. At No. 15, on the top floor, Charles Dickens lived for a while after his marriage with Katharine Hogarth, daughter of the editor of the *Evening Chronicle*; it is not commonly known that his first lodgings in the Inn were at No. 12, in 1835—two years later he removed to Great Doughty-street. In our "Note" on the "Old Bell" we mentioned that on the front it bore the arms of the Fowlers, of Islington; that relic has been deposited in the Guildhall Museum.

The Chapel,
Tottenham
Court-road.

We understand that Mr. Rowland Plumbé has prepared designs for a new chapel to be built by Messrs. Kinglerlee, of Oxford, whose tender for 11,101*l.* is accepted. The existing iron structure was set up in place of the original chapel—commonly known as Whitefield's Tabernacle—which in 1889 was condemned, the foundations having given way. Of that chapel, erected on the site of Crab and

Walnut Tree Field, by Coyer's Gardens, and a large pond, called the "Little Sea,"* John Whitefield laid the first stone in May, 1756; his resources were aided by Selina, Countess of Huntingdon, Benjamin Franklin, and, it is said, by members of the Royal Family, together with Garrick, who gave 500*l.* for paying the workmen, one of them being his own stage carpenter at Drury-lane Theatre. The original building, about 70 ft. square on plan, with a hipped roof carrying a square lantern and cupola is illustrated in our article of June 13, 1891, on "The Bedford Estate." To that, in 1759-60, Whitefield added a front portion, octangular on plan, nicknamed "The Oven." In 1828 the lease expired; the chapel remained closed until 1830, when the trustees bought the copyhold and made considerable alterations in the structure, which assumed its more familiar form, with portico and turrets, thirty years later. The property has been the subject of litigation extending over many years. In 1887-8 a disorderly fair was held in the burial ground, which, it seems, was unconsecrated, and had been used until 1853 for the interment of, it is said, nearly 30,000 bodies: see our columns of August 28, 1888. The London County Council ultimately bought the ground for 5,000*l.*, the Vestry of St. Pancras contributing, and opened it to the public on February 16, 1895. The remains of Whitefield's wife, of John Bacon, R.A., and of Toplady, were removed into a vault beneath the organ. Whitefield's chair, and the rostrum of his mahogany pulpit, which in his time rested on a pedestal, we saw in the vestry and upper schoolroom nearly eleven years ago.

Houses
Occupied by the
S.P.C.K.

THE Society for Promoting the Christian Knowledge, who have reached their bicentenary in the current week, held their first meeting in Mr. Justice Hook's house on March 8, 1698-9. Their domiciles in London have been very numerous. For a few years the Society met at Samuel Brewster's chambers in Lincoln's Inn, and at Child's coffee-house in St. Paul's Churchyard. In 1703-4 they assembled at (old) Sion College, Mr. Shute's house in Bartlett's-buildings, Holborn, and at Mr. Ibbot's. In the following year they met in St. Dunstan's coffee-house, and the chambers of W. Melmoth, bencher of Lincoln's Inn, who compiled a valuable record of the history of his Inn. Having returned in 1716 to St. Dunstan's Quest-house (from No. 6, Serle's-court, Lincoln's Inn-fields), they then first secured separate premises of their own, April 4, 1728, in Bartlett's-buildings, which they finally quitted in 1827, having in the interval (October 1758 to October 1777) occupied No. 9, Hatton-garden. From Bartlett's-buildings the Society removed in 1827 to Newcastle House, Lincoln's Inn-fields, which they had bought of the Duke of Newcastle, and occupied it jointly with a well-known firm of solicitors. In November, 1879, they migrated to their present premises in Northumberland-avenue, erected on a freehold site obtained by them.

The distinguishing feature of this year's exhibition of the Society of Painters-Etchers (at the Gallery of the Society of Painters in Water

* See the map engraved by Basire and Seale (after Rocque), 1749.

Colours) is that the art of mezzotint is specially represented, by nearly one hundred examples. A good many of these do not properly come within the province of the Society's exhibition, the word "painters-etchers" implying (if it means anything) original work by etchers, whereas a large number of these mezzotints are copies of pictures and drawings by Turner and other artists; many of them, especially those of Mr. Frank Short, very beautiful work, but still copies. Among the original mezzotints are some beautiful landscapes by Mr. J. Knight, Nos. 208 and 209 especially; they may perhaps be said, indeed, that Mr. Knight's capabilities show better in the monochrome work than in his paintings, which, though always fine in their way, are a little mannered and restricted in colour. Mr. Carroll's "Cloud Study" and "After Storm" (127, 128) are also admirable examples of what mezzotint can achieve. Among the etchings proper are a considerable number by Mr. Strang, powerful, but some of them exceedingly ugly and grotesque. Among those who are to be admired thoroughly are Mr. Robertson's two little sketches in Sandwiche (26, 27), Mr. Holroyd's "Study of Head" in dry point (32), Mr. Haydon's highly-worked and effective "San Marco" (40), Mr. Watson's "Lincoln Cathedral" (45), Mr. Schumacher's "Potato Harvest in the Pennant Valley" (47), a composition reminding one of Jules Breton; all Mr. Edwards' contributions (66 to 70), pure etching; Mr. Slocombe's "Fishing Boat Unloading" (88), M. Helleu's "La Dormeuse" (246), Mr. Legros' "Retour du Bois" (3), chiefly remarkable for the fine and pathetic character of the figures—the landscape and surroundings are too roughly handled. There are also some excellent works by Mr. Charlton and Mr. Burridge, and some good dry-point figure studies by Mr. Slocombe.

The Goupil
Gallery.

A COLLECTION of works by painters of the English, French, and Dutch schools, at the Goupil Gallery, though rather unequal in interest, contains some works well worth looking at. Among these may be specially mentioned Mr. Swan's beautiful little nymph playing in the sea, in "The Tiresome," M. Maris's "Towing at Sunset," a picture painted in an exceedingly broad, one might almost say rough style, but of great power and truth of effect.

The Paris
Exhibition.

THE Prince of Wales visited the site of the Paris Exhibition last week, where models for the principal palaces were explained to him by the architects, and afterwards went over the work-yards for buildings already commenced. The architects expect to have the two principal palaces finished before the end of next year. The engineers, MM. Résal & Alby, exhibited to the Prince the models for the new Pont Alexandre III. The foundations for this bridge are nearly completed, and it is expected that the bridge will be open to traffic on New Year's Day of 1900.

The Nave of
Exeter
Cathedral.

IN a paper read to the Executive Diocesan Architectural and Archaeological Society, Canon Edmonds deals with "The Length of

* "Notes," May 22, and October 30, 1897.

Man Nave of Exeter Cathedral." After disposing of the discredited theories that the west front did not extend beyond towers or north porch, he produces the evidence of existing remains and measurements to show that the nave of the Norman Cathedral was as long as it is to-day. Interesting as this evidence is, the conclusion, all, is identical with that arrived at by late Archdeacon Freeman, and quoted in *The Builder* for June 6, 1891, though it is only satisfactory to have this view confirmed in so able a manner.

THE MIDDLE AND LATER RENAISSANCE.*

BY PROFESSOR AITCHISON, R.A.

In a former lecture I told you that the Manuscript of Vitruvius, or what is now called the *De Architectura*, was discovered by Poggio Bracciolini in Gall in 1414; that it was rapidly copied and dispersed; and that somewhere about the "Editio Princeps" was published in 1470, and consequently every one who wanted to be supplied with Vitruvius' work, or at least could study it, and consequently knew about the methods pursued by the Romans than the first measurements would be made, and that the Renaissance was not only looked upon Roman architecture as the perfection of all possible architecture, but they possibly thought that would help them and Italy to resemble the Romans, and get peace, happiness, and personal power. They then became inclined to look with somewhat of contempt on the works of their predecessors. All the recollections of the Romanesque Byzantine and Gothic buildings, and that charming freshness which came from an imagination unshackled by rules and dealing with a new style of which they were but little, was looked on with pity and contempt, and the architects sought to do nothing according to the Roman rule, and copy features and mouldings as exactly as possible from Roman remains.

The Italians had by no means lost all their fine vigour and originality, but still they were much more fettered by rule than before. Michelangelo, Vignola, Jacopo Sansovino, and above all Palladio, had become thoroughly acquainted with Roman examples and Roman rules, and although this gave them greater power of producing dignified buildings, it removed their work very far from the charming freedom and originality of the early quattrocentisti, and gave their work a more or less mechanical look. As Michelangelo was so fond of saying that "he was no painter," he might have added that he was no architect either; but he was one of the few men that the world has seen, and achieved secular sublimity which should partially atone to us his grave faults.

The bulk of the early fifteenth century men they wanted to get greater simplicity and ease in their work than Gothic had afforded them, and used their pilasters and columns, their pedestals and entablatures, to show that they were not altogether ignorant of classical models; but Michelangelo, who was no constructor, used his orders just as he wanted to produce some particular effect, without the least regard to structural propriety; at the staircase of the Laurentian Library the coupled columns are let into recesses in the walls, and have their bases, which stand on the solid wall, apparently supported by coupled trusses in the front, but in all that the staircase hall is one of the most striking things that one has seen, and the staircase itself is of most vigorous and original design, though without much more reasonable basis than the position of the columns themselves. The building on the Capitol at Rome is also attributed to Michelangelo, and is certainly both vigorous and striking, but his Medici Chapel, commonly known as the new Christy of San Gervasio, is in my opinion the masterpiece of his architectural works. On not going into it, an architect is agast at the liberties he has taken, and at the poverty of one of his inventions; two carrels upside down support the the capping of little pro-

jections over the secondary pilasters, while a little truss supporting nothing goes over the rail and into the middle of the panel above the statue of Giuliano; but on remaining in the chapel for a sufficient time you lose sight of all its solecisms and feel that it eventually arouses in you a feeling of sublimity perhaps unique in the works of the middle Renaissance, no doubt greatly owing to the superb sculpture.

By way of a parenthesis I must say that the capitals of the secondary pilasters are both original and effective, though the eggs and tongues upon the necking are upside down. To show the enormous pains Michelangelo would take, below the string which supports the sitting statue of Giuliano there is a row of antique masks, forming an ornamental band below the dentils; from the other side of the chapel these masks seem identical, but, on going up and examining them, you find that there are not two alike.

There is one plea I must put in for Palladio (1518-1580), that his Basilica at Vicenza has got those qualities of breadth and simplicity that mark it out as one of the great triumphs of the later Renaissance. The constant repetition of one feature along so vast a building, and its simplicity, makes it attain a look of sublimity by which it carries off the palm from the more graceful Library of St. Mark's, by Jacopo Tatti, called Sansovino.

San Micheli, the great military engineer and architect, has designed some very fine gates, but I think the Porta Nuova at Verona has got the same delightful effect that Brunellesco got in his Pazzi Chapel, and Palladio in his Basilica. I can hardly say whether the omission of the orders in the fronts of domestic buildings can be traced back to the Romans, but certainly the pedimented window-heads can. They are to be found in the so-called Temple of Diana at Nimes. Peruzzi mostly omitted the orders; Raphael did the same in his Pandolfini Palace at Florence, and so did Antonio Piccone, called San Gallo, in the Farnese Palace at Rome. The top story of this is attributed to Michelangelo, and I think the badly designed windows of the second floor are his, and, without doubt, the large cornice must have been his idea, although it was said to have been profited by Vignola. When one comes to think of it, nothing can be more ridiculous than making the columned fronts of an abandoned temple into a dwelling house; directly it has struck you, you look at the great bulk of the Renaissance work, which is the mere filling in between the columns, as a device for rendering buildings that have gone out of use habitable; but if one can overlook this solecism, many of the facades are ingenious and effective, and though all those delicacies and improvisations that give so much charm to the early Renaissance buildings are sacrificed, a more stately and dignified building is obtained. Most of the buildings I have mentioned I have seen, and among those of what may be called the Middle Renaissance, none is more effective or more striking than the Communal Palace at Brescia, said to have been built by Formentone in 1508.* Of course, its colossal size is a very great element in its impressiveness; even a common brick wall, if very high, and seen from a narrow passage, has a certain sublimity about it, as when you look up on a moonlight night between the Asinelli and the La Garisenda at Bologna; but here at Brescia, besides its size, it is of splendid marble with much admirable carving, and artistic devices of the highest order. The original front consists of two stories crowned by a tall balustrade. The ground story consists of three enormous arches supported by large piers, with moulded architraves and impostes, and I may say that each of these piers is about 8 ft. wide; the arched openings lead into what once seems to have been an open market. In the centre of each pier is a Corinthian column supporting a light entablature; a low balustrade above it, gives height to the whole front. In the frieze of this entablature are lions' and human heads of such great projection that they look like gargoyles, but they convey the idea of length in the frieze by their repetition; in the spandrels of these arches are two large hemispherical sinkings, each filled with a bust the size of life, or larger. Here you have six hemispherical recesses with sharp circular edges, filled with deep shadow, from which the large busts come out light; the five heads above act almost as a scale to make you recog-

nise the width of the openings, and the length of the front, while the balustrade above has four balusters and an interval in the distance between the centres of the lions' heads. At the back, and standing slightly above the top of the balustrade, is the podium for the pilasters above, and this podium is broken forward under each main pilaster and under the window pilasters to form pedestals to them; the angle pilasters have Corinthian caps. The two pilasters next the centre window have a deep necking, highly enriched, as well as shallow capitals, and the panels of the pilaster-shafts are also carved in high relief. These pilasters stand in the middle of a very shallow pier, the sides of which go right round the space between the main pilasters and the windows, and form a panel; in the centre of these panels are enormous bosses in fluted circular dishes, with floral corners. The windows are ornamented with side pilasters, the top two-thirds being fluted and the lower third reeded, which support a deep entablature. The architrave has three fascias and is quite plain, the frieze is carved with animals and cupids among the scroll-work in high relief, and has a modillion cornice. The window-heads come up to the soffit of the main entablature of the building. In the architrave over the centre window is a large plain slab lettered. The top balustrade is blank and very lofty, and seems originally to have crowned the building; over each pilaster stands a figure holding a water-pot, which possibly at one time carried off the rain-water from the roof. On the balustrade pedestals at the angles of the building are two obelisks with balls on the top, and at the side of each and over the central figures in front of the balustrades are isolated and draped figures. No one can deny that these arrest the attention, but there seems no propriety in their introduction, and I think the building would look better without them. They do not show now on account of the octagon of later date, probably intended to carry a dome. The main effect is gained by what we moderns call symmetry by proportion, and by the disposition of the light on the building and the shade of the openings.

The Palazzo Farnese is, perhaps, the most striking of all the great palaces that are treated without the orders, and where the effect is produced by the outline of the palace, by the windows, and by the massive cornice alone. The palace is of colossal size, and consists on the ground floor of twelve windows with a central gateway. The sills of the windows are moulded, and the upper moulding is carried through to form a dado; the sills themselves are supported by large and heavy consoles under the architraves. Outside the window architraves there are two vertical panelled sides that have wide trusses springing from them at the top, and the whole window is surmounted by a simple cornice. The space between the tops of the window heads and the string above is very deep in consequence of most of the chambers being vaulted. The centre gateway is rusticated and has rather the air of being an alteration, as it is brought so close up to the two side windows that flank it that the rustications cut off the profiles of the cornices, and the whole feature is out of character with the palace. There is then a deep string with a frieze below it ornamented with fleurs-de-lys, being a continuation of the cornice to the doorway. Above this is a moulding forming a dado that runs the whole length of the front, breaking forward round the pedestals that support the composite columns of the first floor windows with an entablature and pediment above them, the pediments being alternately triangular and segmental. The balustrade over the entrance-gateway is of the same height as these pedestals, and over the gateway is a large Venetian window. The two sides of the window consist of two pilasters, with a column in the front of each, while two other columns within the pilasters complete the window. The top of this central window is not pedimented, but it is marked by three shields: the large one in the middle is gigantic, with the crest running up to the string of the next floor, while the smaller shields are placed over the side columns that project. The top floor, which is attributed to Michelangelo, is by no means happy. It has a similar dado to the one below, but instead of pedestals, coupled consoles supply their places, and support the two thin Ionic columns of the window. These windows have triangular pedimented heads all alike, but for some reason best known to the architect, and which looks like a whim, the

* Being the sixth and last Royal Academy lecture on architecture this Session. Delivered on Thursday afternoon, February 17.

* An illustration of this building will be found in the *Builder* of February 23, 1895.

windows, instead of being square-headed, are round, their archivolts running up to the soffit of the cornice, which is cut back almost to the wall, giving the notion that the pediment was to be lifted higher by levers at each end. Immediately over them, after the deep space left for the vaulting of the rooms, comes the main frieze, ornamented with fleurs-de-lis in high relief, beneath the immense cornice. The angles of the building are rusticated, with long and short rustications. I think for an ideal effect the end windows are brought too near the angle rustications, but the whole effect of the Palace is dignified and majestic, and, apart from its immense size, this dignity is mainly arrived at by simple repetition. It is doubtful if any building of modern times has so majestic an effect, or reminds one more of a palace that a great Roman, like Agrippa, might have chosen for his dwelling. There is, too, a feeling of admiration and respect for the architect who sacrificed everything to produce the particular effects he wanted, simple dignity and majesty. Here, at least, the Italians had got the Roman ideal, but bought at the sacrifice of almost every grace and beauty, for though it is so grand and so majestic, it is also unutterably dull, and we cannot help wondering whether the uniform window properly lighted each room. I think it may be looked upon as the very last step taken by the architects of the later Italian Renaissance before they indulged in rococo caprices or contortions.

The building surrounding the courtyard of the Spada Palace, by Giulio Mazzoni, 1565, is striking by its stucco ornament, as is also the courtyard of the Marino Palace at Milan, by Galeazzo Alessi, 1550-1572 (see lithographs of these two palaces).

Baldassare Longhena is believed to have been born between 1600 and 1604, died when he was over eighty, in the year 1682, and is said to have kept on his mason's shop to the last. He was a contemporary of Bernini, and was only younger by a few years, and was, in my opinion, as an architect, decidedly his superior, for, though great credit is given to Bernini for dwarfing St. Peter's by the enormous Colonnade he built in front of it, it is one of those achievements, of which, in my opinion, no architect need boast.

Longhena built the Rezzonico Palace on the Grand Canal, bought by Browning the poet, and now possessed by his son, as well as the Palazzo Pesaro. The last is certainly the palace in Venice which most strikes the stranger on his first visit, be he architect or not; and though it has many faults, one must not forget that the captivating of the eye of the multitude is an achievement. It is grand in size, and its front walls are of enormous thickness. The ground floor is rusticated, and the sides are of two stories; the centre has two arched gateways running up to the cornice, with a niche between them. Its rustications, cut into facets, are rather too sparkling. The front is of two stories above the ground, and it is horizontally divided into a wide centre and two narrow sides by coupled columns. The first floor has a rococo balustrade showing the tops of the pedestals of the Ionic columns which support an entablature; at the back of the columns is an arcade supported on small columns with enormous foliated keystones and figures in the spandrels; the top story has composite columns standing on high pedestals, on which are deep blocks under the bases of the columns and balustrades between the pedestals. The columns support an entablature with a frieze of exaggerated depth, through which run the consoles of the cornice over each column; the rest of the frieze between them is ornamented with festoons and other sculptured ornaments. Behind the columns the top story is arcaded on composite columns with keystones flush or projecting beyond the main architrave, and with sprawling figures in the spandrels. But in spite of the too sparkling rustication, contorted figures and rococo details, it strikes one as being the work of a great man. His still more famous church of Santa Maria della Salute is built on a marvellous plan; what may be called the nave is an octagon, having an ambulatory serving for the chapels outside it, and with the great dome over it; between it and the choir is a long narrow chamber, rounded at each end, with a dome in the middle, while the altar stands in the front of the choir. The outside of this church has been more often painted, I should think, than any other church in the world. Its domes and

towers compose admirably from almost every point of view, and the great buttresses that spring from the drum and abut the thrust of of the dome have their ends carved into scrolls, which are peculiar but most effective; and from the back of each of these scrolls rises a pedestal on which stands a gigantic figure. It has often been said that Longhena took the idea of these scrolled buttresses from one of the illustrations to the *Hyperotomachia* of Poliphilus, but it is quite as much like any of these illustrations "as a hawk is to a handsaw." The main entrance front of the octagon of the church is paraphrased from a Roman triumphal arch.

I give you the front of the Palazzo Medici at Rome, by Vansanzio, the Dutch architect of the seventeenth century, because it is the French Academy at Rome.

I give you a few of the later churches, and by no means the worst, to show how the Renaissance architects fell into mere costliness, difficult workmanship, and distortion, as the natural outcome of an art not founded on construction, whose original aim was to imitate Roman architecture. The public will have novelty at any cost; but this novelty comes naturally through new wants, greater knowledge, and improved aesthetics, if properly founded and carried out. In Italy the love of pure beauty, of native invention, and of great artistic skill, the very passion of the artists of the early Renaissance had exhausted itself, probably the race itself had sunk, and all the grace and originality had given place to a dull pedantry, as may be inferred from the writings of Milizia. The artistic craftsmen no longer pursued architecture, and there was not wit enough left to see that Roman architecture itself was but a sort of bungle of Greek forms applied without logic to the new sorts of buildings of the Romans. The only legacy the late Renaissance left us was the idea that we must copy some one else's work, instead of inventing one for ourselves; so we have had imitation Greek, imitation Gothic, and then the imitation of every bastard style the various countries of Europe have produced. I am happy to say that architects are beginning to have their eyes opened, and see that architecture is above all things a constructive art; but that this construction must be clothed in the forms that will give the proper character to the building for the purpose it has to fulfil, and to do this we must study the lessons past architecture can teach us, and what we can gather from nature, and when the public properly appreciates what art does for a nation and for the world, architecture will again come to its throne.

I must not, however, leave out John Addington Symonds' prophecy.

"At first the enthusiasm for antiquity inspired architects and scholars alike with a desire to imitate *per saltum*, and many works of fervid sympathy and pure artistic intuition were produced. In course of time the laws both of language and construction were more accurately studied; invention was superseded by pedantry; and Polyziano and Alberti came Bembo and Palladio. In proportion as architects learned more about Vitruvius, and scholars narrowed their taste to Virgil, the style of both became more cramped and formal. It ceased at last to be possible to express modern ideas freely in the correct Latinity required by cultivated ears, while no room for originality, no scope for poetry of invention remained in the elaborated method of the architects. Neo-Latin literature dwindled away to nothing, and Palladio was followed by the violent reactionaries of the *baroco* mannerism."

In one all-important respect this parallel breaks down. While the labours of the Latinists subserved the simple process of instruction by purifying literary taste and familiarising the modern mind with the masterpieces of the Classic authors, the architects created a new common style for Europe. With all its defects, it is not likely that the Neo-Roman architecture, so profoundly studied by the Italians, and so anxiously refined by their chief masters, will ever wholly cease to be employed. In all cases where a grand and massive edifice, no less suited to purposes of practical utility than imposing by its splendour, is required, this style of building will be found the best. Changes of taste and fashion, local circumstances, and the personal proclivities of modern architects may determine the choice of one type rather than another, among the numerous examples furnished by Italian masters. But it is not possible that either Greek or Gothic

should permanently take the place assigned to Neo-Roman architecture in the public building of European capitals."

I hope J. A. Symonds' prophecy will not be fulfilled, but not being a prophet myself I cannot speak with certainty, but if his prophecy be true, and architecture cannot progress, it must be swept into the limbo where heraldic necromancy, astrology, and perpetual motion now moulder in peace.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL General Meeting of this Institute was held on Monday evening last, No. 9, Conduit-street, W., Mr. W. M. Fawcett, Vice-President, presiding.

The Chairman moved that, subject to His Majesty's gracious sanction, the Royal Gold Medal for the promotion of architecture be presented to Professor Aitchison, R.A. The motion, having been seconded by Mr. H. J. Florence, Vice-President, was agreed to unanimously.

The meeting then terminated, and the next general meeting (business) of the session will be held, Mr. W. M. Fawcett, in the chair.

The Chairman announced that the Council had resolved to increase the value of the Owens Jones Studentship from 50l. to 100l., and that the holder of the studentship would be required to make a tour extending over six months, such tour to be devoted to the improvement and cultivation of his knowledge of the successful application of colour as a means of architectural expression.

The following candidates for membership were elected by show of hands, namely:—*As Fellows*: G. Lethbridge, London; E. J. Boardman, Norwich. *As Associates*: J. Hobson, Liverpool; W. C. Hulbert, London; J. Ormrod, Bolton; D. C. Maynard, London; T. Honnor, London; H. J. Pearson, F.S.A. London; R. H. Morton, London; H. Shepherd, London; W. McCulloch, St. Andrew; Fife; J. F. Duthoit, Dover; H. A. Collins, London.

The proceedings then closed.

Portrait of Mr. Penrose.

Mr. J. S. Sargent, R.A., having now completed the portrait of Mr. F. C. Penrose, F.R.S. Past-President, the formal presentation to the Institute has been arranged for the 21st inst. At the same meeting Mr. J. D. Crace will read a paper on "Heraldic Drawing and its Adaptation."

ACETYLENE AND CALCIUM CARBIDE.

SOME six or seven years ago, Mr. Willson, Canadian experimentalist, discovered accidentally that by heating a mixture of lime and carbon in an electric furnace, calcium carbide could be produced. As usual, other experimentalists were working on similar lines at about the same date, and have claimed priority as to the date of discovery, but it appears beyond dispute that Willson was the first to publish the important announcement. Although Willson was manufacturing the carbide long ago as the year 1892, it was not until the commencement of the year 1895 that the matter was brought prominently before the British public by Professor Lewes in a lecture at the Society of Arts. Acetylene gas made from calcium carbide and burned through suitable gas-burners was then first publicly exhibited in this country. Glancing over the three years which have since elapsed, we find that this apparently insignificant compound obtained from lime and coke has in three short years given birth to factories in America on the Continent, and in our own country. From a scientific curiosity it has become a common article of commerce, manufactured it has been stated, at a rate of something like 20,000 tons per annum. At Foyers, in Scotland, a large installation driven by water power has been manufacturing carbide for some time past, and although this is the only factory at present producing carbide in this country, it is no doubt merely the forerunner of many others. One of the amusing results of the establishment of this new industry has been the fevered rush to the Patent Office of a never ceasing stream of would-be inventors anxious to be first in the field with acetylene appliances, while a tragic side has been presented by the

ports to use the gas after it has been liquefied by compression, and which has been the cause of fatal accidents.

Acetylene is being used abroad for public lighting and for driving motor cycles, and as such is gradually spreading in this country for lighting country residences and for other purposes, a few details as to its commercial utilisation may interest many of our readers who like to be well informed upon all matters connected with artificial lighting. Calcium carbide is sold in small lumps having a crystalline metallic appearance, and provided it be kept dry it may be handled and stored in perfect safety; in fact, it may be held in a gas net in a fire, and will not burn or undergo any change. Immediately, however, it is exposed to become damp, or is brought in contact with water, acetylene gas having a peculiar purr is produced, and if ignited will burn with a highly-luminous flame. Like coal gas, it is a very explosive mixture when mixed in certain proportions of air, and being so thermic the violence of the explosion is greater than with coal gas. The acetylene is produced by a chemical reaction taking place between the water and the carbide, and less than the two are brought in contact with one another no acetylene can be formed. But the atmosphere contains enough moisture to cause a reaction to slowly take place when the carbide is exposed in its ordinary condition, and, consequently, it is found necessary to store the carbide in air-tight receptacles. In fact, one pound of carbide should produce but 5 cubic ft. of acetylene, and a convenient way at which to burn the gas for common lighting purposes is about one cubic ft. per hr. At present the price of carbide in large quantities is a little under 20s. per ton. When burnt at the rate of one cubic ft. per hour through a suitable burner, such as the Napier burner, the illuminating power of the acetylene will be considerably greater than that of a common burner consuming London coal-gas at the rate of 5 cubic ft. per hour, and the intensity and brilliancy of the flame is such that it attracts universal admiration. Professor Wey, in drawing attention to the great importance of using pure materials for the manufacture of carbide, states that, although he has specimens of carbide that contained enough purity to render them dangerous, such carbide has always been of foreign manufacture. With regard to liquefied and compressed acetylene, it may be well to point out the fact that acetylene in this form is so dangerous that the Home Office has very properly issued stringent regulations respecting it.

MAGAZINES AND REVIEWS.

The Architectural Review (Boston) devotes its illustrations in Vol. V., No. 9,* to several of competition designs for the National Academy of Design, New York. The selected design, by Messrs. Carrere & Hastings, is hardly one to arouse enthusiasm; it is a mere "school" design with a rusticated basement and a coupled Ionic order over it, and the elevation both of that and Mr. Flagg's design has a very weak effect from the manner in which the lower building at each end seems merely tacked on to the central mass, with the steep slope of roof repeating that of the centre. The side elevation shows a bad effect in another way, from the ridge of the side roof not being central with that of the block against which it sits. Mr. Flagg's detail elevation produces a rich effect with a profusion of Roman and Greek detail mixed. The most artistic elevation among those illustrated is, to our mind, that of Messrs. Babb, Cook, & Willard.

The Art Journal contains a very well-written article on David Cox by Mr. James Rock, who may be expected to write in a sympathetic spirit, and who expresses admirably what is the special quality and interest of his art. In "The Present Condition of Art in Scotland" Mr. Jas. L. Caw takes a rather laudatory tone; there are two or three remarkable Scottish painters at the present moment, but we hardly think that the art of Scotland to-day, as a whole, can be said to be comparable with the best in Europe.† Is Mr. Caw a Scotchman? Mr. Fred Miller continues his series of "Cunning Work for Clever Artists" i.e. lessons in decorative art work for amateurs, dealing in this number with metal-work and repoussé.

* One is obliged to describe it thus, as the *Architectural Review* bears no date on any of its issues.

The Studio (February 15) has also its Scottish article, on "Some Glasgow Designers," concerned mainly with the stained glass designs of Mr. Oscar Paterson, in which there is a great deal of originality and suggestiveness, though it is rather in the way of odd and picturesque fancies than in the higher walks of stained glass design.

The Magazine of Art deals largely with decorative work; an article on "Swansea Porcelain," by Mr. Cosmo Monkhouse, a historical sketch; one on "Artistic Metal Work," by Mr. Arthur Vallance; one on a new sculptured door-way or door-frame by Rodin, which appears to be a really remarkable work, and one on the work of the late woodcarver of Florence, Frullini. The article on the Calderon School of Animal Painting in Baker-street is of interest, and some of the life studies of animals by the pupils very good.

The Artist contains a portrait of Jean F. Millet, and illustrations and a description of "A House in Surrey," of which Mr. W. Pite is the architect, and which as a specimen of a moderately-sized picturesque house for a picturesque site is worth illustration.

The Antiquary commences a new series of illustrated papers by Mr. Geo. Bailey, under the title "Ramblings of an Antiquary," this paper being occupied with some paintings on the walls of St. Peter-at-Raunds, Northamptonshire.

The Nineteenth Century contains an article on the Millais Exhibition by Mr. Claude Phillips, which is one of the best, if not the best, of the critical estimates of Millais' work which have appeared since his death.

Harper contains a short article on "The earliest Painter in America," Gustavus Hesselius, who was born in Scotland in 1685, and came to America in 1715. It is curious and unexpected to find from this article that in America nearly two hundred years ago an artist received a commission to paint a large altar piece of the Last Supper, which was duly executed. As Mr. Hay, the author of the article, remarks, "this was the public patronage of art for legitimate purposes nearly two centuries ago, and yet from that time almost up to the present such patronage has been a dead letter" (in the United States we presume it meant), "and no one till now even knew that it had existed here."

In the *Century Magazine* the series of "Old English Masters," with engravings by Cole, deals this month with Richard Wilson, of whom Mr. J. C. Van Dyke writes a short article, which tells sympathetically the rather melancholy story of Wilson's rise into fame and subsequent decline. As a fact, Wilson did not merit all the fame which he had at one time, still less the neglect into which he fell in later life; but with the exception of Gainsborough he was undoubtedly the best English landscape painter of his time, and he commenced, moreover, before Gainsborough.

In the *Revue Générale*, M. Goffin's article on "Pisa" is continued, but is concerned in this number especially with the frescoes in the Campo Santo. M. Verlant, under the head of "Chronique Artistique," gives an interesting and full critical summary of some recent artistic work in Paris.

Dekorative Kunst devotes a long article to the description and illustration of the work of Mr. Voysey, which is we suppose more especially in sympathy with the special class of art advocated by this new German journal; otherwise, with all appreciation of the work of Mr. Voysey, we should have thought that there were some other English architects who had a prior claim to special attention.

The Quarry continues its series of articles on "Applied Geology," and gives an account of fuse-firing in mines by electricity. This method has now been introduced at the Festiniog Quarries, and this is stated to be its first use in underground slate quarries of North Wales. It is rather surprising that it should not have been used long before.

THE ORGAN, GLOUCESTER CATHEDRAL.—An appeal is made by Dr. Spence, the Dean, and Mr. A. H. Brewer, the organist, for subscriptions to a sum of £50l. for adding a solo organ; together with some necessary stops to the present instrument, which was rebuilt some years ago by Willis. For the original organ, by Renatus Harris, a screen was erected in 1823 by Dr. Griffith, prebendary; the organ, by Harris, was enlarged by Bishop seven years later; it is stated that some of the old stops are preserved.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

THE RELATIONSHIP BETWEEN THE ENGINEER AND THE ARCHITECT.

A MEETING of the Discussion Section of the Architectural Association, in conjunction with the Institution of Junior Engineers, was held at the rooms of the Royal Institute of British Architects, 9, Conduit-street, on Wednesday evening, for the purpose of discussing the subject of "The Desirability of a Closer Relationship between the Engineer and the Architect." The chair was occupied by Mr. M. Garbutt (Chairman of the Architectural Association Discussion Section), and he was supported by Mr. H. Bloomfield Vorley, A.I.E.E., Chairman of the Institution of Junior Engineers.

The Chairman, in opening the proceedings, said his first duty was to welcome, in the name of the Discussion Section, Mr. Bloomfield Vorley and his fellow members of the Institution of Junior Engineers. The increasing separation of the various branches of the constructive art, and the tendency of most of its practitioners to become specialists, appeared to be consequences of the increasing range and complexity of modern knowledge, and although in some cases the resulting concentration of individual effort might facilitate the attainment of very high results, yet it imposed limitations such marked divisions should have arisen in an art that was, in its elements, one; and it was in the hope of assisting—if only slightly—in the task of softening the dividing line between engineering and architecture, that the committee of the Discussion Section sought the co-operation of the Institution of Junior Engineers in arranging that meeting. The Council of the Institution met them in a very gratifying manner, with the result that they were now assembled to discuss the reasons for the desirability of a closer relationship between the engineer and the architect; and he hoped some hints might also be elicited as to the means whereby the drawbacks of the existing system might be lessened.

Mr. Percy J. Waldram, P.A.S.I., of the Institution of Junior Engineers, read the first paper dealing with the subject from an engineer's standpoint. He remarked that Continental architects were enthusiasts in their work, and they found in the craftsmen they had to employ in the various branches of work men of like enthusiasm with themselves, trained in the excellent Continental technical schools, not only to produce good work in their particular branch, but to design and to aim at high ideals. The architect, if he wished to remain the master designer—and his enthusiasm would be content with no lesser place—must keep pace with them, must study processes of different crafts, and must be able to design in any material and harmoniously group the work of every trade. He was thus led to master every detail which would affect the beauty and harmony of his building, and he did not leave engineering work alone. He was accustomed to meet skilled designers in every other trade, and he demanded and created a supply of skilled engineers with whom he could collaborate, and who were none the less skilful as engineers because they were able to admit that the cheap production of so many square inches of section for what they believed would be so much stress; men who were practised in entering into the feeling and *motif* of a general design, and adapting their work to it, without, on the one hand, destroying its own individual identity; nor, on the other hand, producing shams. The result was far-reaching on both sides. The architect was enabled to take full advantage of the engineer's material—his spans and heights were bolder and nobler, and his work, without becoming flimsy, became strong and graceful as the result of true design in a strong material. The engineer grew accustomed to mould his details without the absolutely unnecessary ugliness which was the result of careless and crude manipulation of intractable material, and whether he might be designing an iron roof, a column, an engine base, or a gun carriage, his first ideas quickly and intuitively grasped the true and natural form the material should take to attain a desired end, and his design became graceful because it was true adaptation of means to an end, and not necessarily weak or "gim-

cracky," because it had not the solidity of a steam-hammer. Of course, such advance in engineering design was not exclusively Continental, and it also at times induced excesses which were absurd. But nickel-plated piston rods and gilt mouldings on an engine base were no parts of true design, and he thought it would be frankly admitted that we English engineers could find much that was instructive, much that was beautiful, much that was decidedly economical in what might be called the spontaneity with which Continental engineers, under the influence of architects, adapted their material to do its work. In America, the spirit of the engineer seemed to pervade buildings almost to a greater extent than that of the architect. Thus, in Continental and American work, they found not a little that was instructive. They also found engineers and architects working closely together, sometimes from reasons which differed, and they saw both sides deriving benefit therefrom—benefits which might lead to extravagances, but which on the whole were of material as well as of aesthetic value. In England such organised and natural connexion was largely conspicuous by its absence. The architect, as a rule, knew the engineer chiefly as a "painful necessity," who required obtrusive beams and tie-rods which would not harmonise; the representative of strong and massive ugliness, who would get over difficulties if he was allowed to have his own way, but whose effect on a building was to be dreaded. The engineer's idea of an architect was often, he feared, that of a man who wanted results, and whose client could afford to pay for them; who could not, or did not, invite competition, and with whom there was no great necessity to take much trouble, nor to make modest estimates. If the architect's buildings or his client's interests suffered from elementary engineering design, and too large a proportion of the cost being spent on engineering work, that was not the engineer's business, and he was too much occupied with the market price of iron and draughtsmen's wages to trouble about the relations of economy many times removed. He (Mr. Waldram) was quite aware that in many instances the old order was changing, and that both architects and engineers were already assimilating the fact that their work overlapped and largely affected that of each other. There were architects who were sufficiently conscientious to consult independent non-commercial engineers in large matters and master small ones for themselves, but that course reduced their fees and encroached upon their time, which meant money. On the other hand, there were engineers who, though left with a practically free hand, would conscientiously endeavour to produce results in the best as well as the most economical manner, and when necessary employ architectural assistance. But that course reduced their profits and encroached on their time, which also meant money. Both sides suffered material loss, and only acquired theoretical gain in doing so. As they had not largely developed a quick artistic sense nor a hair-splitting passion for competition, it must be left to professional honesty to right the system and to acquire the national results which they now lost. Habit was very powerful, and to imagine the busy and established architect and engineer making any change was all but impossible. Improvement must be made a matter of habit, and he would venture to express the opinion that it was the imperative duty of Institutions on both sides, having a proportion of younger members, to do all in their power to extend early and fruitful personal connexions. When their papers and visits were of a mutual interest, then let mutual invitations be sent. When a member, young or old, on either side could introduce work or wished to receive advice or assistance, let him communicate through his secretary to the secretary of the kindred Institution, and a large field of assistance would be open to him. By mutual courtesy and mutual help let the two professions grow together; both would benefit, and in the future it would be found that improved technical education in England and the far-reaching effects of foreign and home competition would operate in England and her colonies in the same way that it operated now on the Continent and in America, and then the men who had brought their work and knowledge up to the required level, the architects who could speak with the weight of personal general knowledge of the engineering work

which their clients' requirements necessitated, would be the men who would be wanted, and the engineer who had learnt to bring his work and designs into touch with that of the architect would be the man whom the architect would entrust his work to. Mr. Waldram proceeded to outline the practical advantages derivable from a closer relationship between the engineer and the architect, remarking that however such ideals as he had drawn might appeal to their present enthusiasm, it was well to recollect that the millennium was not yet reached, and practical advantages must be found before such a system found universal approval. He would therefore suggest that members of these two Institutions, even now in their everyday office experience, frequently found themselves entrusted with, or responsible for, work of an architectural or of an engineering character—which, whatever their ability, was really outside the range of their experience, and which would be better done partially or wholly by a practised designer or a skilful engineer. It would, possibly, not be easy at first to devote even a small fee for such assistance, however valuable; but there was no doubt whatever that a communication to either of the secretaries would very quickly find a suitable man qualified by experience with the particular kind of design or the particular knowledge required, but who would not be under the disadvantage of feeling compelled to charge a heavy professional fee. Such should soon lead to reciprocity, and if the communications were made through both secretaries, those who were earliest in the movement would be best known to them, and would stand the best and earliest chance of reciprocal work. He would urge engineers (especially professional in contradistinction to commercial men) not to hesitate to seek the collaboration of architects whenever architectural skill was necessary in their work; for he believed architects would not be slow in return, and he need hardly suggest that architects had the responsible control of a very large field of engineering work, and a still larger field of potential work now left untouched. When the engineer came to actual discussion and communication with an architect over matters of design he might learn much that would be impossible for him to acquire elsewhere. He might be pardoned for supposing that visits to engineering works and papers and discussions thereon would interest architects, and would tend to broaden their ideas of the possibilities of engineering design as applied to buildings.

Mr. Sydney B. Beale, A.R.I.B.A., next read a paper dealing with the subject from the architect's point of view.

Mr. Beale said no doubt could be entertained that there was not a close relation between architects and engineers at present; the question of the desirability of closer relation required consideration. It was not a promising start to begin by each profession telling the other that it required more culture; but that was what the position amounted to. Architects admired the ingenuity of engineering constructions, but were annoyed at their want of refinement in design and proportion, while engineers saw a want of purpose and a superfluity in many architectural details. Of course such a thing as a gashometer, for instance, did not admit of agreeable treatment in design, but it was an error of taste and an outrage on the fitness of things to surround it with a series of quasi-architectural columns. Some engineering productions, however, were susceptible of pleasing treatment, but the ornament took the form of cast-iron rosettes and coats of paint. Then, any man who had attainments of a particular kind was apt to look down on others who had not the same kind of knowledge, and thus arose a misunderstanding of each other's principles and aims. These were the difficulties to be overcome; they were great, though they had grown from small beginnings. The temples of Greece, the aqueducts of Rome, the domes of the early Christians, represented art combined with the best construction of the day. As time passed on ultra-utilitarianism on one side, and dilettantism on the other side, had separated designers into two classes, and the requirements of the age and the conditions of life did not now permit of the existence of the scientific skill of a great engineer and the artistic power of a great architect being united in one person. But he would show some reasons for a closer relationship between them.

"Consider for a moment the subject of constructional ironwork now so largely used in

architectural design. This is clearly the engineer's side. From the earliest introduction of cast iron to the latest adaptation of steel, architects have known, and still know, little of these materials; they have not been the designers of the work executed in these materials, although it forms such a vital part of their buildings. Merchants, middlemen, and quasi-engineers have come to the rescue. They are prepared to design the scheme, supply the material, and construct the work without payment in fees—that is, as fees—all on a system which is possibly expeditious and convenient to the architect, but not affording him the best means of safeguarding the client's interests. He is not familiar with the details of iron construction or the strength of the parts, but any doubts he may have are set at rest by the fact that he is justified in assuming that the designer of the constructional ironwork who also supplies the material will not employ in his calculations a factor of safety too low. This is not quite satisfactory. At best the position is an undignified one for the architect, being, as he is, in the hands of the dealer in iron. How can the system be altered? Can the architect design his own ironwork? I think not. From some personal experience in the study of the theory of iron construction, and from acquaintance with the practice in some offices in which a considerable amount of constructive ironwork is designed, I have come to the conclusion that time and circumstances do not permit the architect to become sufficiently expert in ironwork to lay out the scheme of joists, girders, columns, roof principals, &c., to calculate the strains, dispose the material, and produce drawings of the parts in such detail that there remains only the cost to estimate and its execution. I do not arrive at this conclusion with any sense of misgiving or apology for the profession, because I hold that it is quite impossible for a man to reach his full height as an architect, which is his duty, and at the same time to be so much of an engineer as to be expert in the design of constructional ironwork. Now, what I wish to suggest, among other points for consideration, is the possibility of engineers being of more use to architects in this matter than they hitherto have been. If there was a closer relationship between the professions, would not an architect look to an engineer for reliable advice and design in ironwork in his every day practice? This course is followed in some instances of modern theatre building, and they are exceptional, but there is a vast amount of ironwork construction in the hands of architects which does not call for the skill of a Sir Benjamin Baker or a Max am Ende, but which could be dealt with by an engineer on a lower plane of eminence.

We are but discussing principles; it is, therefore, not necessary to enlarge on the details of an arrangement by which the general body of architects and engineers might co-operate in this matter, but I will say this, and I say it in all seriousness, that I know the disinterestedness of many true architects is such that they would gladly place whatever artistic skill they may possess at the disposal of a friendly engineer, and at the same time would not expect to be furnished in return with scientific help involving much labour without a proper recompense.

This is no Utopian idea incapable of realisation. It has had a tentative trial in the comparatively recent action of the Royal Institute of British Architects in reference to the proposed new bridge at Vauxhall. A design for the bridge as an architect would like to see it was prepared in the name of the Institute, and placed at the disposal of the Engineering Department of the County Council. It was not expected that this architects' design would be closely followed by the responsible engineer; there is no close relationship between us as in the days when we were one and the same person.

We do not fully grasp each other's aims; we have been estranged so long. The Institute action has, however, made itself felt. The County Council and its advisers have since inspected some of the fine bridges of continental fame. We may, therefore, imagine it has been realised that there is more in good bridge design than merely spanning the space.

Some strong reasons for more co-operation have been considered in relation to the design of constructional ironwork. The same process of reasoning is applicable to such branches of engineering as electric lighting, exceptional heating, ventilation, and sanitary work; in fact, all classes of work in which the present advisers

the architect is a tradesman first and an artist afterwards.

There remains to be considered what will be the practical outcome, the developed result of a closer relationship between the engineer and architect, if such co-operation and mutual help have endeavoured to describe should grow out of this discussion of the subject. I dismiss as unworthy and unlikely, any reflection that engineers gaining architectural knowledge, or architects gaining engineering skill, should be tempted to practise in each other's intimate domain. But the question which need not be so summarily dealt with is: given a closer union, will there be a predominating influence, and, if any, which will it be?

The principal modern example embodying a large scale the joint work of the engineer and architect is the Tower Bridge, but there is a union of ideas, no singleness of purpose, no allusion. They have not understood each other. There is a strong influence of cast-iron in the design of the masonry towers, but this is not quite the characteristic that should result from the co-operation of an artist in building with a scientific constructor.

This is one of the early failures. There will be improvement. Very few architects at present understand the principles which guide an engineer in his design, fewer engineers appreciate the considerations which affect an architect in matters of planning composition, mass, detail, colour, and ornament. It is, therefore, the interest of the general community, and the interest of the beauty of great cities, and in the interest of engineers and architects themselves, that it is desirable there should be a closer relationship between them, a relationship based on a closer knowledge of each other's work, on a deeper sympathy with each other's aims, producing, from the interchange of ideas, a result that shall bear the impress of the chastened influence of both professions."

Mr. E. A. Berry opened the discussion which followed. Reference had, he said, been made to the absence of beauty from the engineer's work. But what could be expected when the poor engineer was tied down to 500*l.* for work which should by right bring him 5,000*l.*? Granting that the engineer had not given sufficient attention to appearances, was it not a fact that the architect had been too zealous in that direction? He referred more particularly to domestic buildings. Usually a tremendous amount of work was put into the elevation of these; but in the interior they would find a cramped staircase and a hall so narrow that a man could not take his coat off with comfort. Generally speaking, there was room for a better understanding between the two professions, and he regarded it as a happy augury that the juniors, who were as yet free from the obstinacy which characterised their seniors in the profession, should be able to lead the way in bringing into practice what was so often preached.

Mr. H. V. Lanchester said it was more than possible that the inconveniently-designed houses of which Mr. Berry spoke were not from the designs of architects at all, but were the work of the speculative builder. He cordially agreed with the suggestion that with regard to constructional work and the other phases of special work—heating, for instance—the architect should act in concert with the engineer.

Mr. A. W. Marshall said he was afraid the architect was too prone to regard himself as supreme. In planning large buildings, too, he usually paid little heed to the requirements of the engineer, with the result that the latter often came out very badly. Architects, he thought, should always consult the engineers upon the disposition of the internal space of large buildings. Often the engineer was left, in the absence of a good understanding with the architect, to put down electric light installations and mains and pipes in the best way he possibly could. It was a very common thing, also, for architects to allow too small a margin in the matter of price for the engineering. There was no doubt that their work had very much in common, and he rejoiced to know that there was a prospect of a better understanding.

Mr. C. H. Brodie said it was once an axiom that every Englishman could do two things—drive a gig and play cricket. He was inclined to add that nowadays there seemed a third quality—that every Englishman could design, or thought he could. The grievances architects felt against engineers for undertaking purely architectural work applied with equal force to

some other professions. For himself, he thought the consulting engineer could be of the greatest benefit to the architect in obtaining the best results in his work. Architects were excusably sore that civil and mechanical engineers who sought and obtained posts as surveyors to public bodies should undertake to design everything—from a clock tower to a bridge over a river. He ventured to suggest that one result of this was the advertisement so often appearing: "Wanted, an architectural assistant—Apply to the Borough Surveyor." Of course, Mr. Waldram would justify the custom by pointing out that architectural assistance was obtained. Yes, he (Mr. Brodie) knew that it was so—at 30*s.* per week.

Mr. B. H. Joy, as a marine engineer, said it was only in recent years that the marine engineer and the naval architect had been drawn so closely together as they were at present, and their relationship served as a useful parallel to the engineer and the architect. Not many years since the naval architect designed ships, and the various officers came along and arranged for the space that should be allotted to them; with the result that it was not unusual at the completion of the design that little or no room was left for coal bunkers and engines. All these difficulties and dangers had been overcome by a closer alliance between the naval engineer and the naval architect.

Mr. Owen Fleming remarked that many of them regarded the discussion section of the Association as the pioneer section in which all their hopes for the future were laid. The discussion that night was an evidence that the movement for closer relationship was growing slowly but surely. There was a belief that, whether in the building of bridges, cathedrals, asylums, or what not, the engineer and the architect could in closer relationship better perform the work entrusted to them. The reason was not far to seek. The architect on his part could not but feel that the engineer was absolutely honest—honest in the sense that his work was coherent and expressive. He could not observe, for instance, a railway locomotive or an ironclad without feeling that the engineer was no jerry-builder.

Mr. J. G. Read said the two papers were full of suggestions, but neither gentleman attempted to define the functions of the engineer and the architect. He himself understood a little about the functions of the engineer, but he could not define those of the architect. The engineer was the man who devoted his time and powers to the development and the utilisation of the great powers of nature for the service of man. Having said so much, he should like to suggest that the engineer and the architect were one and the same thing. The work of the engineer depended upon scientific knowledge, not available in the times of the ancient Greeks and the Romans.

Mr. H. H. Statham said his complaint against the engineer was that he did not know what the architect wanted, while the architect knew exactly what the engineer required. He quite agreed that the engineer should act according to scientific principles; but why should he resort to unnecessary ornamentation which was supposed to be architectural, but was not? The Tower Bridge was not, he thought, quite a successful example of the co-operation of the engineer and the architect. Indeed, he regarded the bridge as one of the most objectionable structures now existing in London. The Fort Bridge, as a gigantic, magnificent specimen of engineering structure only, was, however, something they all could admire.

Mr. H. W. Price remarked that, although there were unfortunate examples of the co-operation of engineer and architect, he saw no reason, on looking closely at things, why there should not be an improvement. The difficulty was that the engineer and the architect looked at things from such a different point of view. So long as that occurred, co-operation would be slow in coming. But he was quite certain that architects could not get on in important works without the consulting engineer, and the engineer, on the other hand, had so much to do with constructional work that they could not get on without the architect. No doubt such discussions as these were to their mutual advantage in removing the difficulties.

Mr. H. Bloomfield Vorley, replying to Mr. Statham's criticism of engineering ornamentation, said he could not help thinking that the engineer was at a disadvantage in not having studied archaeology, with which the architect was well acquainted. At the same time the

engineer was, in these days, perfectly at sea, owing to the uncertainties and inconsistencies in the architect's styles of ornamentation and design.

The Chairman said it was impossible to expect that the high attainments of the two professions could be combined in one man, yet at the same time he felt that it would be an advantage for members of either profession to equip themselves with a general knowledge. The average architectural student was practically educated in a specialist's school. Was it not possible, as well as extremely desirable, for the students in either profession to become acquainted with some of each other's work?

Votes of thanks were accorded to the readers of the papers, to the Royal Institute of British Architects for placing the room at the disposal of the Discussion Section for the meeting, and to the Chairman for presiding at the proceedings.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—At a meeting of this Society held on the 1st inst., at the Standard-chambers, King-street—Mr. John Ely in the chair—Mr. J. H. Reynolds, director and secretary of the Manchester Municipal Technical School, read a paper on "Technical School Buildings." He said that in the construction of the Manchester Corporation Technical School in Sackville-street advantage had been taken as far as possible of the experience gained in the erection of similar buildings elsewhere, and that in consequence there were many matters of professional and technical interest connected with it. It was, however, to be borne in mind that schools differed so much in aim, resources, scope, site, and other circumstances, that one rarely found the methods adopted in one place just those best suited to the conditions and requirements of another. As an illustration of this he pointed to the absolute necessity of providing for the greatest possible amount of light in buildings situated in a city like Manchester, which, by reason of the narrow streets and the pall of smoke which overhangs it, enjoys but little of the blessed light of the sun. The question of fenestration assumed vital importance under such conditions, and virtually determined the style of architecture, or at any rate limited the range of choice. From this point of view the Gothic style, as exemplified in the Town Hall or in Owens College, was to be condemned. So, too, was a style of architecture which required for its best effects heavy projections and consequent deep and widely-extended shadows, or, again, a style which demanded small windows for the sake of gaining picturesque or quaint results. He knew that architects delighted in the sense of repose which was derived from large blank wall space as a relief from window openings and other distracting features of the elevation of a building, but that it was possible to make a satisfactory compromise between the demand for light and architectural conventions was seen in the fine building of the Williams Deacon and Manchester and Salford Bank in Mosley-street, and in the warehouse recently erected by the Tootal Broadburs' Lee Company in Oxford-street. It might be granted, nay required, that we should make our public buildings characteristic, beautiful, and impressive to the eye of the passer-by, but these things should be attainable without any sacrifice of utility. Mr. Reynolds proceeded to offer various suggestions as to the means by which beauty and utility may be obtained in our technical school buildings. His paper was illustrated by a number of limelight views. On the motion of Mr. Edward Salomons, seconded by Mr. J. H. Woodhouse, a vote of thanks was accorded to Mr. Reynolds for his paper.

EDINBURGH ARCHITECTURAL SOCIETY.—The Edinburgh Architectural Society met on the 2nd inst. in Dowell's Rooms—the President, Mr. W. Nicholson Cumming, in the chair—when Mr. A. Hunter Crawford, representing the Edinburgh Architectural Association, delivered a lecture on "Steam-heating." The lecturer adopted the plan of discussing the solution of an actual problem before his audience, illustrating the subject by sketches and a working model, showing a combined method of steam-heating and domestic hot-water supply.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—A meeting of the members of the Birmingham Architectural Association was held on the 4th inst., at Queen's College, Paradise-street,

when an address was delivered by Professor Aitchison, R.A. The President of the Association (Mr. C. E. Bateman) presided. Professor Aitchison, in the course of his address, said the first thing any one who desired to become an architect should be sure of was that he had a natural gift for the work, and if he found that he had no taste for it, and that he had been mistaken in the passion, he should get his living in something else. The profession of an architect was by no means a moneymaking profession, and if a person found he could not devote himself with all the energy he possessed to the study of architecture he might surely do something better than spoil the look of the face of his own country. Architecture was pre-eminently a constructional art, and consequently it was of the utmost importance that any man who wanted to become an architect should make himself sufficiently acquainted with the subject, so that he could build with satisfaction to himself and to those who used the edifice. The science of construction was statics, and it was necessary that every man who professed to be an architect should learn sufficiently of statics to be able to gauge the security of walls against the pressure of wind, water, and earth, and even against the pressure of goods, stowed against them, that had an inclination to slide. He must know the pressure that was exercised by vaults, domes, and arches, and learn how those might be properly abuted, as well as understand how to prevent walls, piers, and columns becoming forced out of the vertical. Besides statics, they had to learn the force and strength of the different materials that were used. Unless a man knew the outlines of construction, he could hardly be called an architect, although he might be an admirable designer and planner. In planning it was important that each room, passage, and staircase should be as well adapted as possible to the uses to which it was to be put. The whole should be packed into as convenient a place as possible, so that there might be no lost room, and the most-frequented apartments should be conveniently situated. All public buildings should be well planned and striking or impressive to look upon. Architecture was the accretion of knowledge from the very earliest pre-historic time when any kind of building was put up. The great thing a man who could plan and construct ought to know was how to make the necessary portions of the building he was putting up tell the tale they were required to tell. He was sorry to say that a great deal too little attention was paid to that matter in England, for they saw all kinds of incongruous ornaments and decorations put on all sorts of places. It was probably ten times more difficult to get a thing to look well than was simple, than if it was ornamented. Great ornateness was a mistake, for it was never equal to the perfection that could be obtained by the greatest possible simplicity. He referred at some length to classic architecture, and said that in every architectural epoch of importance the world had known, some buildings were erected that had been the admiration of succeeding generations, and now all persons of culture and wealth would as soon think of being ignorant of the great writers of their own countries as not to have seen Rome, Athens, Italy, and Florence. He did not know we were very much inferior in Gothic days in our works to the French, but he was afraid in his time there had not been so many great buildings put up that would bring persons to see them from all parts of the world. One of the things that to a great extent seemed to be forgotten was that architecture was a constructive art, and sufficient pains were not taken to see how the elegancies of proportion and the beauties of form could be added to our buildings. Those who felt they had divine genius for architecture should use that precious gift properly, and let no labour and no difficulty overcome their desire to make themselves skilful, and to confer such an inestimable boon on their country as to be able to raise buildings which would attract people from all parts of the world. On the motion of Mr. W. Hale, seconded by Mr. W. Henman, a vote of thanks was accorded Professor Aitchison for his address.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A meeting of the members of this Society was held on the 7th inst. in the Institute, Cookridge-street, Leeds, for the election of officers for the ensuing session, commencing on May 1. Mr. George Corson (President of the Society) occupied the chair. The following gentlemen were nominated by the council to

the various offices:—President, Mr. George Corson; vice-presidents, Mr. John Tweedale and Mr. T. Butler Wilson; hon. treasurer, Mr. W. H. Thorp; hon. librarian, Mr. W. H. Beevers; hon. secretary, Mr. F. W. Bedford; members of council, Messrs. W. S. Braithwaite, W. A. Hobson, G. Atkinson, A. France, C. B. Howdill, and A. E. Kirk; auditors, Messrs. H. S. Chorley and W. Pott. On the motion of Mr. J. W. Child, seconded by Mr. Sydney Kitson, the recommendations of the council were approved.

EXETER ARCHITECTURAL ASSOCIATION.—Bishop Kestell, Cornish, formerly Bishop of Madagascar, presided on the 4th inst. at a meeting of the Exeter Diocesan Architectural and Archaeological Society, when a paper was read by Canon Edmonds on the length of the Norman nave of Exeter Cathedral. The author said that Dr. Oliver, who had left them much valuable information, was of opinion that the original Norman part of the Cathedral stopped at the north porch, and that Grandisson added further pillars westward. There were proofs of Norman work in the nave. A document of 1283 showed that Grandisson built the Chapel of St. Ragisund in the north side of the big west door, and in order to do so, had knocked down the original Norman wall. From the various proofs they had, Canon Edmonds contended that the present nave of the Cathedral was precisely the length of the original Norman building.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of members of this Society was held on Tuesday, the 8th inst., at the School of Art, Arundel-street, when the chair was occupied by the President, Mr. R. W. Fowler, F.S.I. A lecture was delivered by Mr. Charles Castle, of Sheffield, one of the lay members of the Society, on "Timber for Construction and Decoration." He outlined some of the many vicissitudes through which timber trees pass from birth to maturity, and explained how environment almost changed the species; and that even in an individual tree, if grown in an exposed position, the side facing N.E. produced different wood in grain, toughness, and texture from the side facing S.W. Mr. Castle rapidly passed in review some of the ordinary woods of commerce such as spruce, pitch pine, yellow pine, red pine, &c.; then teak, Kauri, Oregon pine, mahogany, oak and canary wood, pointing out their various characteristics, and showing in detail many interesting facts in relation to them. Some good specimens of the combination of various woods for decorative purposes were then shown, including yellow pine panels and pencil cedar mouldings, teak and black wood mouldings, black wood and purple wood mouldings, Kauri and mahogany ditto, mahogany panels and canary wood mouldings stained black, Padouk and black wood mouldings, Cuba mahogany panels and walnut mouldings, satinwood panels and purple wood mouldings, fumigated oak panels and brown oak mouldings, Cuba mahogany panels and sycamore mouldings, stained black, canary wood stained walnut or mahogany. The lecturer said that teak was one of the most reliable and beautiful of woods. It had the advantage of standing artificial drying without casting, and it was most durable. Vessels built of teak nearly a century ago were afloat to-day in good condition. A plain varnished railway carriage of teak was instanced as an example of the beauty of this wood. Kauri was a wood also much praised for its beauty by Mr. Castle, who said that its natural colour was like plain satin wood, and used in decoration it would alternate with any darker wood. It was strongly recommended for first-class floorings, staircases, hand-rails, and shop fronts. The various kinds of mahogany were referred to, and samples shown. The immense increase in the importation of African mahogany was noted. The amount of 200 tons in 1886 had increased to the enormous extent of 40,000 tons in 1897. Some interesting facts about English and foreign oak, and various less important woods, concluded the lecture.

INDUSTRIAL ASSURANCE.—In the forty-ninth annual report of the Prudential Assurance Company it is stated that in the Industrial Branch the surplus shown, after deducting the 50,000l. set aside as a Jubilee bonus to the staff last year, is 820,162l., including the sum of 390,660l. brought forward last year. The Board have added a sum of 100,000l. to the reserve fund, which now stands at 600,000l., and will leave the sum of 397,356l. to be carried forward.

DRAWINGS FOR THE ROYAL ACADEMY.

As usual, we shall be glad to receive and deliver at the Royal Academy all drawings intended for the Architectural Room which are sent to us in time to be photographed for publication before sending in.

The last day for receiving drawings at the Academy is Monday, March 28, and we can receive none at this office later than 12 noon on Saturday, March 26.

Every drawing must have two labels giving the title of the work and the name and address of the author, one affixed to the back of the drawing, and the other attached by a string so as to hang over in front of the drawing, and must be accompanied by a letter to the Secretary of the Royal Academy, giving also the title of the work and the name and address of the author. If more works than one are sent they must be numbered, and referred to by the corresponding numbers in the letter to the Secretary.

Gilt frames only are admissible at the Royal Academy.

We cannot provide labels for drawings which are sent without them.

Illustrations.

ILLUSTRATIONS OF RENAISSANCE ARCHITECTURE.

ALL our illustrations this week are devoted to various examples of Renaissance architecture, given in connexion with Professor Aitchison's Royal Academy Lectures, of which the sixth and concluding one is published in the present issue.

CORTILE, PALAZZO SPADA, ROME.

The illustration shows a portion of the facade towards the interior court of the palace, which is situated in the environs of Rome, about two miles beyond the Ponte Salario over the Anio. It is a fine example of rich and contrasted architectural treatment, the plain and massive character of the arcade in the ground story increasing the effect of the richly treated upper story and the frieze and cornice above. It will be noticed how admirably the festoon decoration in the middle stage of the design is contrived so as to bind together and give unity to the whole, connecting the windows and filling up the space between them.

MANZONI PALACE, VENICE.

This is an example, less hackneyed by illustration than some other of the Venetian palace, of the Renaissance of the fifteenth century. Here again we see the value of contrast of architectural treatment, in this case not in horizontal but in vertical stages; the two wings, with their rather massive treatment, with large spaces of wall and pilasters at the angles, enclosing and buttressing the lighter treatment of the central portion.

SAN ZACCARIA, VENICE.

The west front of this interesting church, designed by Lombardo, though somewhat later than the remaining portion, and representing early sixteenth century work, is still a remarkable example of the treatment of Classic detail in a Gothic spirit. The curved cornices remind one of Spalato, and seem as if forming a link between Classic and mediæval architecture in the same kind of manner only in the reverse order of things; Spalato representing the first melting down of Classic severity into mediæval freedom, while San Zaccaria represents the struggle of the mediæval spirit against the inroads of revived Classic.

In this design again we have to notice the happy effect of contrasted treatment of the different stages of the design—the panelled basement, with its square lines, the flat treatment of the pilastered arcade over it, and the columns in the upper stories.

The church is referred to at some length in Professor Aitchison's second lecture, printed in our issue of February 12 (see pages 148, 149).

VILLA MEDICI, ROME.

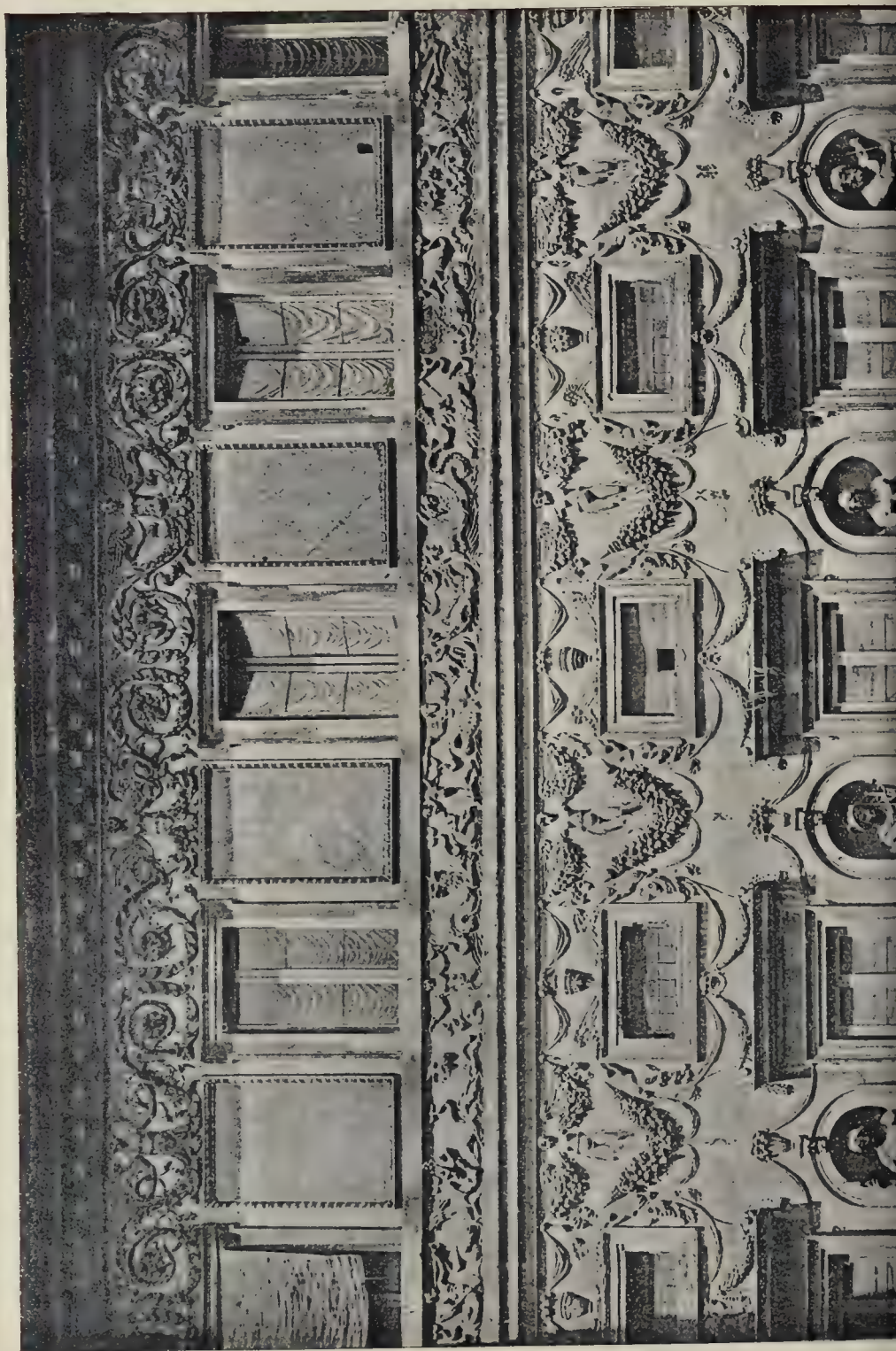
The illustration shows a part of the garden front of the Villa Medici, referred to in Professor Aitchison's sixth lecture, on another page. The Villa Medici has been the home of the French Academy of Art at Rome since the time of Louis XIV.

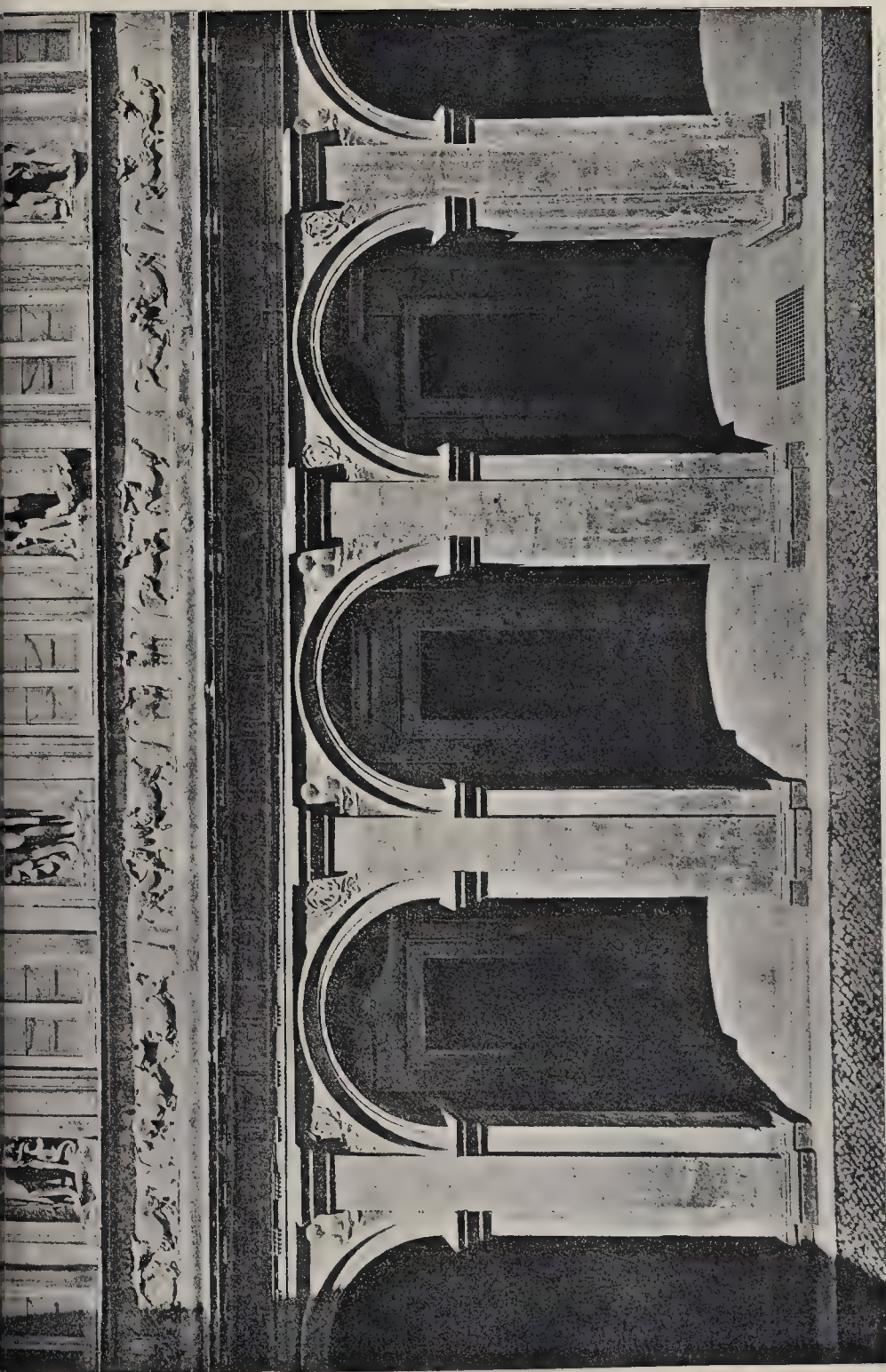
CORTILE, PALAZZO MARINO, MILAN.

This, which is now the Municipal building

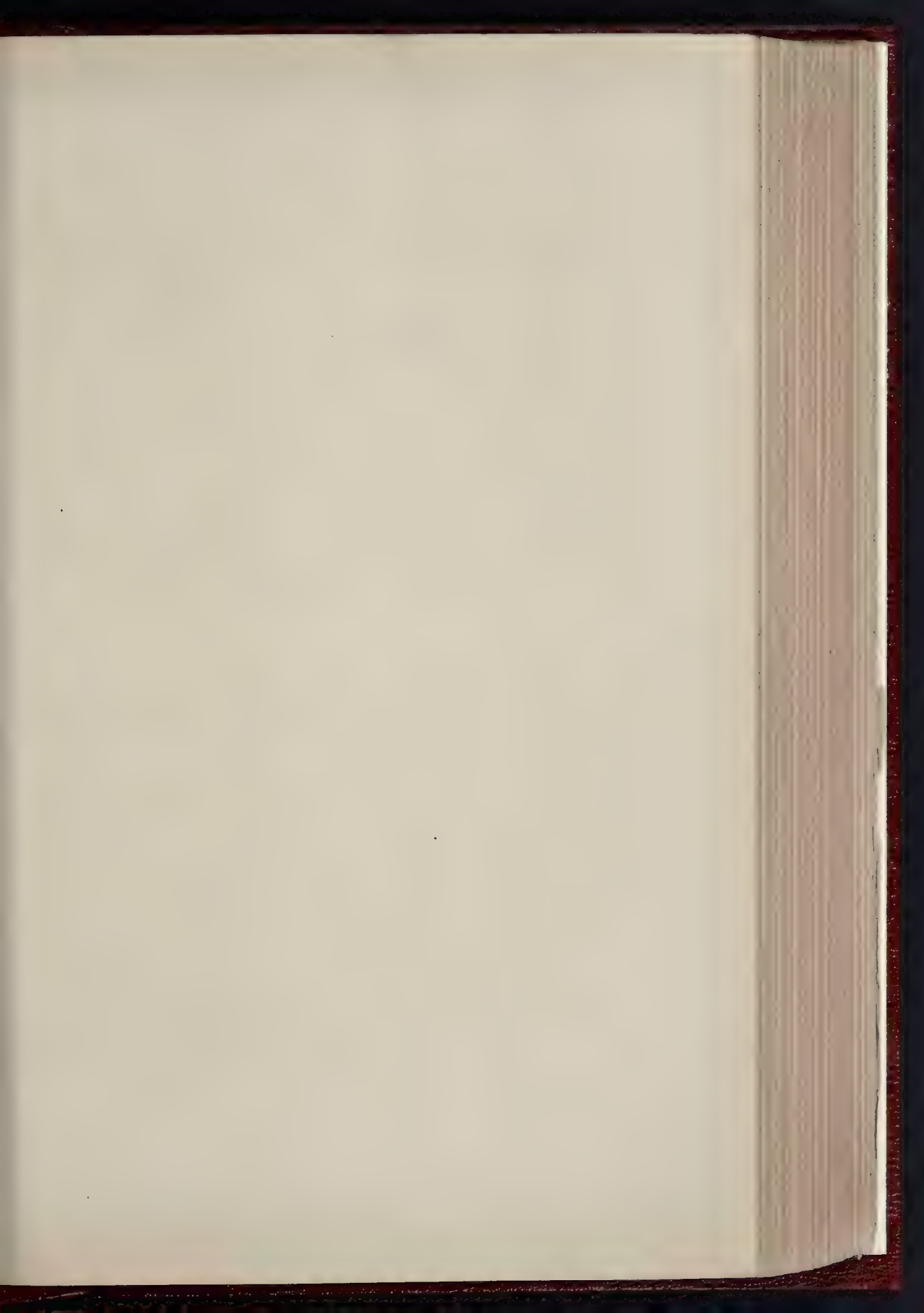


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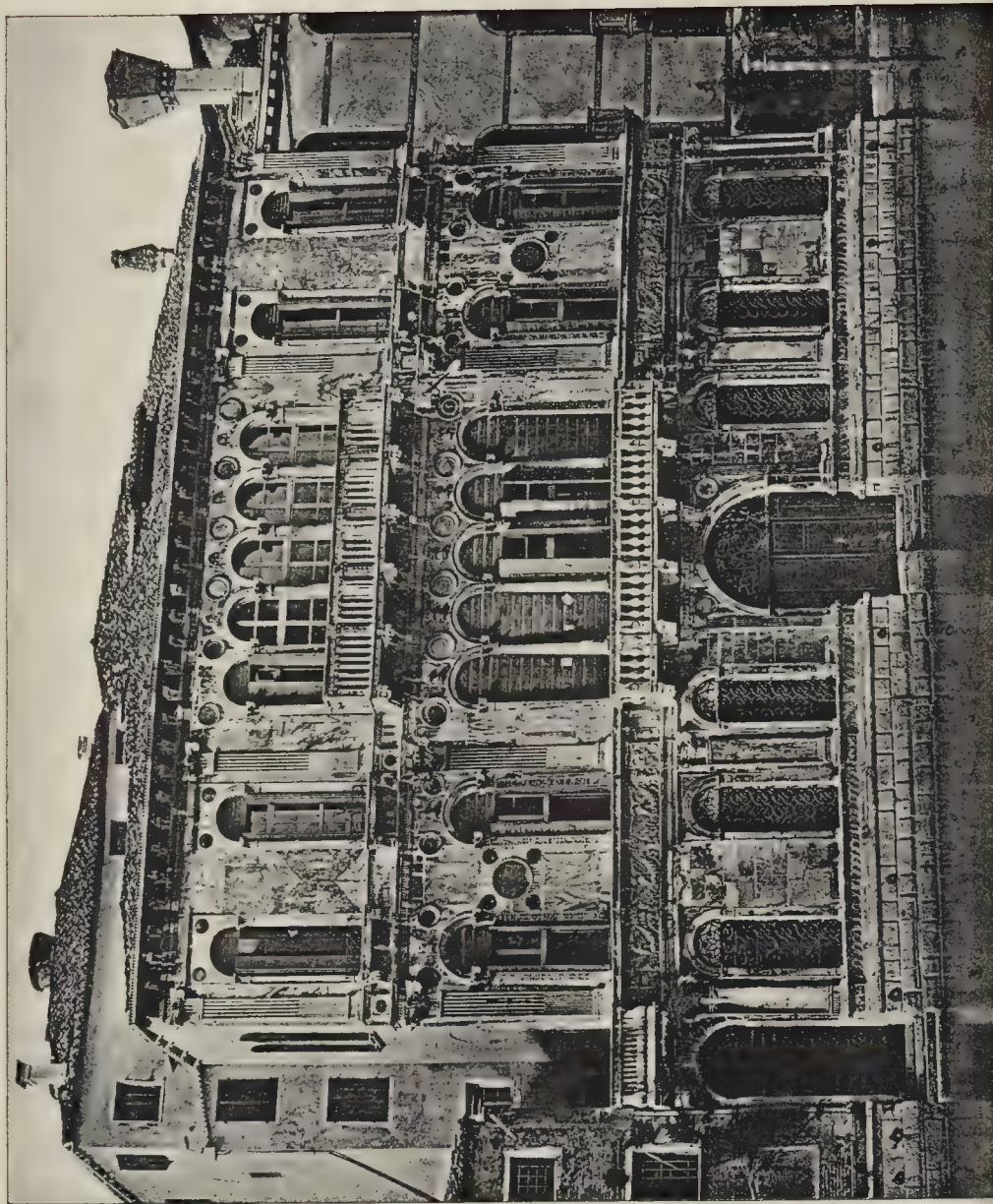




CORTILE, PALAZZO SPADA, ROME



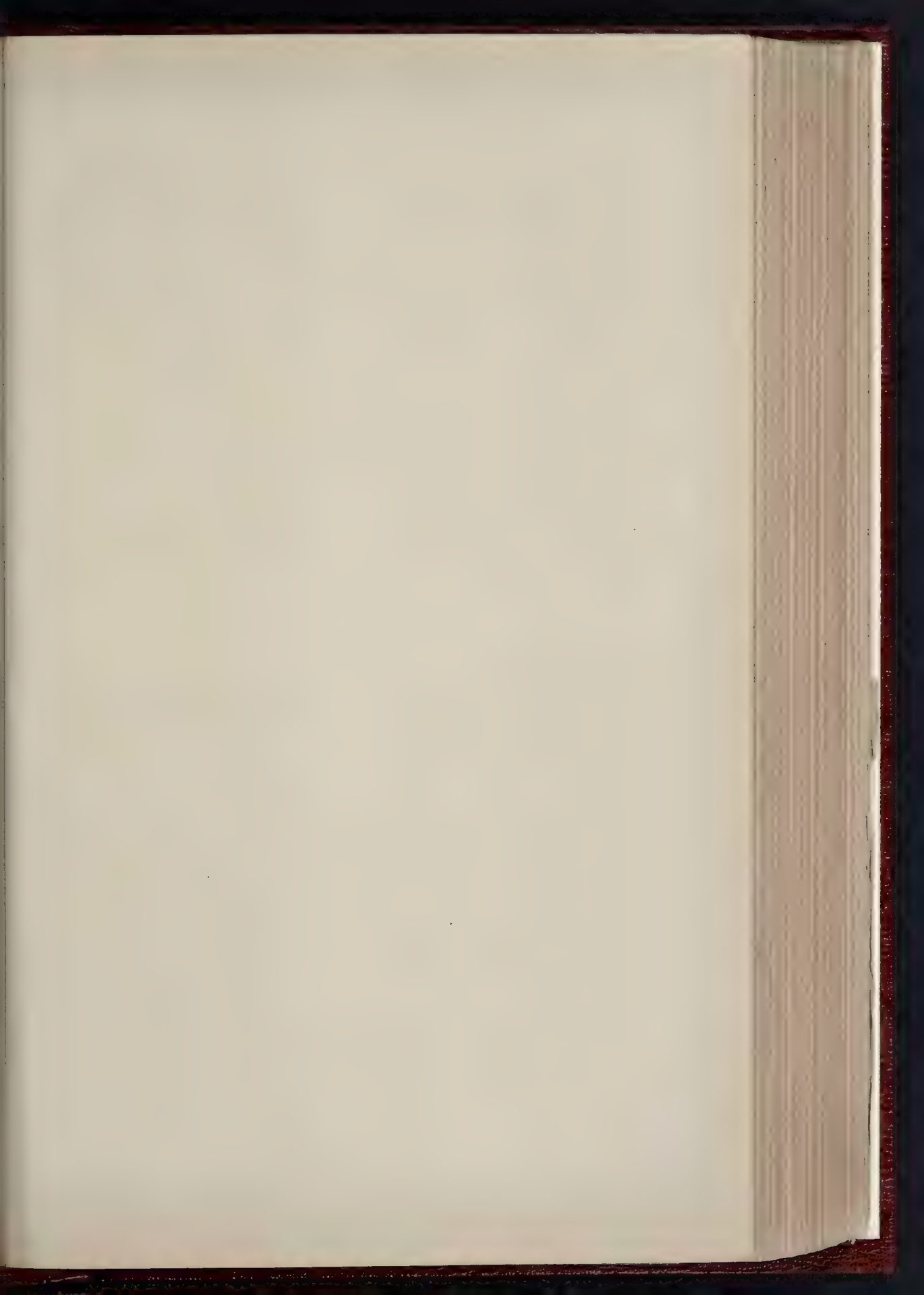
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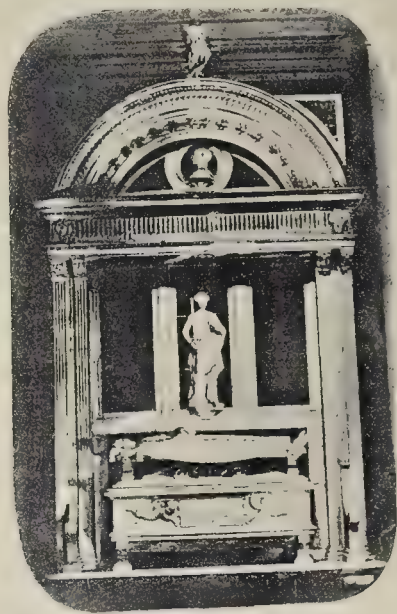
IN P. DE SAPPOLLA'S "L'ART SANITARIO" STREET FETTER LANE E.C.

RENAISSANCE ARCHITECTURE CHURCH OF SAN ZACCARIA, VENICE

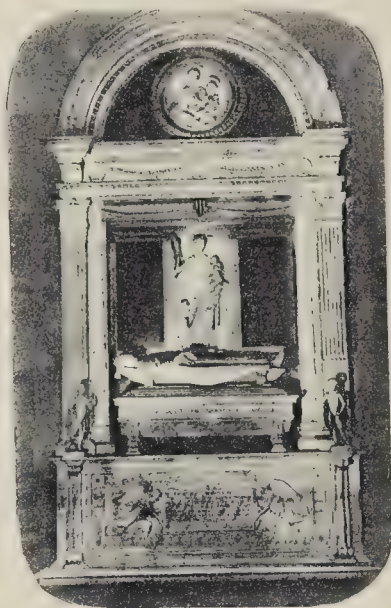




TOMB OF SIGISMONDO MALATESTA.



MONUMENT TO BERNARDO GUIGNI, FLORENCE.



MONUMENT TO UGO, MARQUIS OF TUSCANY,
FLORENCE.



MONUMENT TO PIETRO DA NOCETO, LUCCA.



MENT TO CARLO MARSUPPINI, FLORENCE.



MONUMENT TO ILARIA DEL CARRETTO, LUCCA.

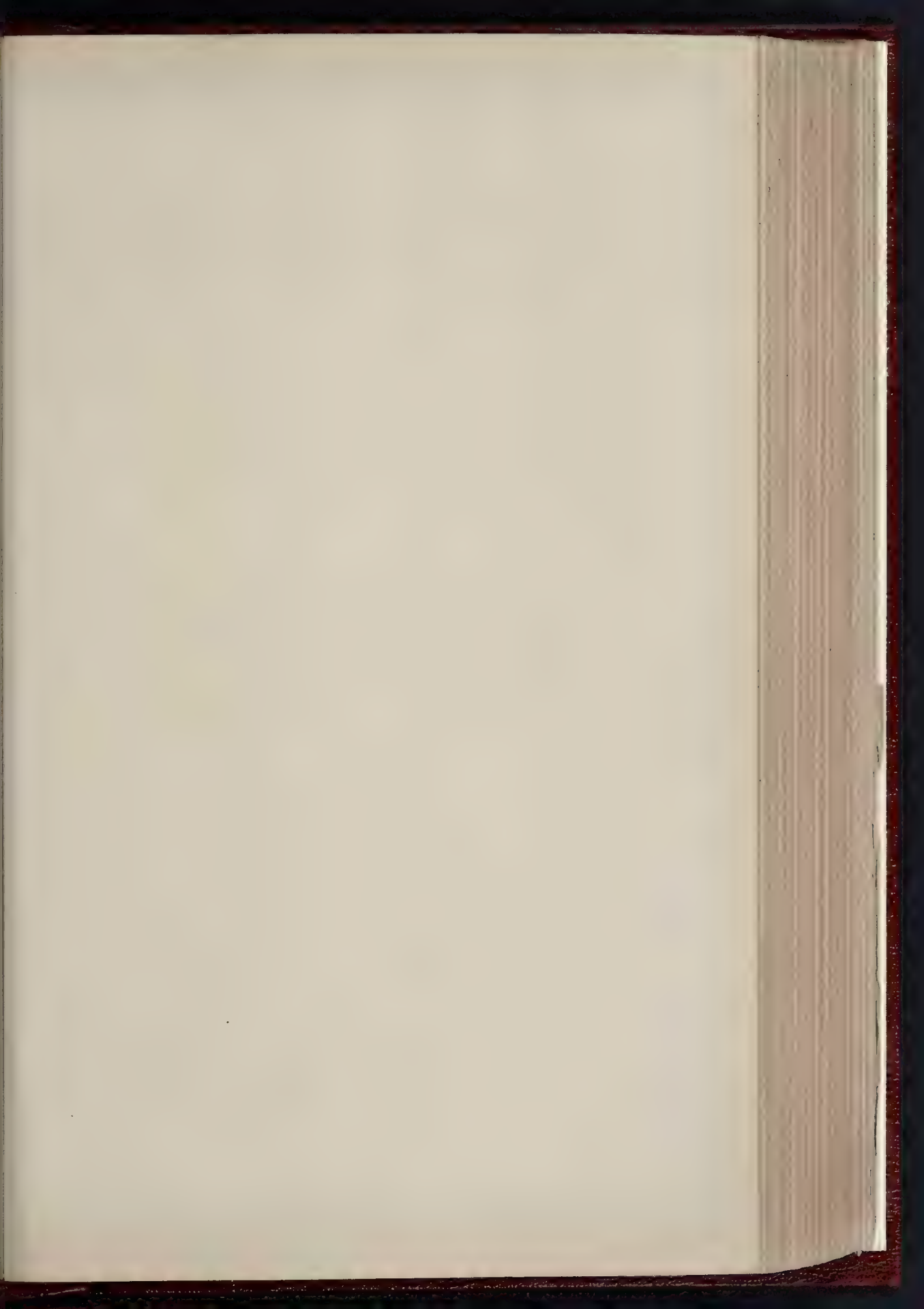


MONUMENT TO LEONARDO BRUNI, FLORENCE.

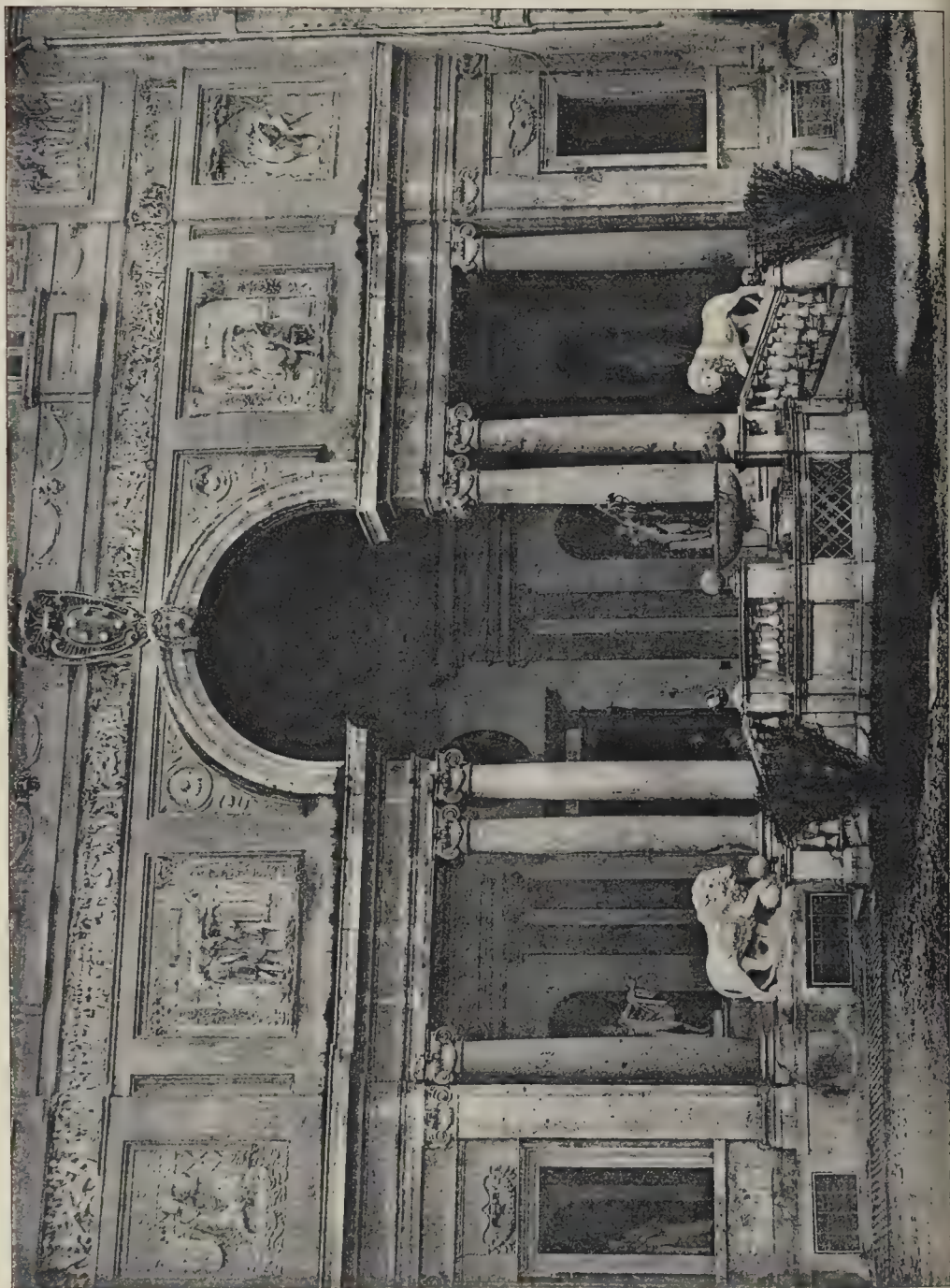


MONUMENT TO BARBARA ORDELAFFI, FORLÌ.

V. P. O. SPRAGUE & CO. 54 C. EAST HARTON ST. NEW YORK N.Y.



THE BUILDER. MARCH 12, 1898





CORTILE OF PALAZZO MARINO, MILAN

Milan, was built in the middle of the 15th century. The illustration shows a view of the interior courtyard which was a remarkable feature in many of the Renaissance villas and palaces. Here again we have contrast between the plain ground story and enriched upper story; it may be questioned, however, whether the ground floor columns are too light in appearance for the superstructure, though the manner in which the coupled columns are made to balance the wide pier is a very pretty and effective arrangement.

EXAMPLES OF RENAISSANCE MONUMENTS.

These illustrations are reproduced, a little enlarged, from the lantern slides used by Professor Aitchison at his fourth Royal Academy lecture. Though the illustrations are small, they do not show detail, there is some interest in grouping the designs together, so as to compare their various characters and the ideas involved in them. Nearly all of them were referred to and criticised at some length by Professor Aitchison in his fourth lecture, which appeared in our issue of February 26. It was possible to give them in the same number as lecture, as we could not have the slides in possession in time for that.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society, held on the 7th inst., Mr. W. By Beaumont, President, in the chair, a paper was read by Mr. William Fox, M.Inst. E., entitled, "Reservoir Embankments: with suggestions for Avoiding and Remedying Defects." The author first made some general remarks on the subject, and then described the instances where difficulties had arisen, and means adopted to overcome them. He described the depth and form of the foundations for the puddle trench, showing how springs might be dealt with by means of cal pipes. He referred to the width of the trench when to be refilled with concrete or rubble, and gave the proportions in both cases of cement concrete. The author gave his experience with reference to the material used and mode of construction of the embankment; particulars of width of the puddle wall; the distribution of material on each side, and width of the top; the stability of the construction of stone or rubble ballast toes under certain conditions; mode of working the clay and of forming layers of the embankment, and the protection of the inner slope from the wash of the water. In connexion with the Den of Ogilvie, the author described the way in which a leak through the concrete was traced and repaired. The Dowdeswell reservoir embankment, which was made to a great extent of rubble, was provided with burned ballast toes within 20 ft. of top-bank level, which had desired effect of preventing any slipping. Monkwood reservoir was also made of rubble, treacherous material, and to prevent slipping, rubble stone toes were adopted. This he desired effect to a certain extent, but it would be necessary to use more rubble stone originally intended, and to flatten the out-slope. These precautions were taken immediately signs of a slip became visible, and successfully prevented any further movement.

THE ARCHITECTS' BENEVOLENT SOCIETY.

The annual general meeting of the subscribers and donors of this Society was held in the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, W., Mr. George Scamell, in the absence of Professor Alison, R.A., President, presiding. The minutes of the last meeting having been read and confirmed, the following report was given by Mr. Percival Currey, hon. secretary, and read:—

The Council of the Architects' Benevolent Society, in presenting their annual report, have pleasure in recording the fact that the progress of the Society's affairs during the past few years has been maintained in the year under notice. One of the many calls upon the means of private individuals during the past year, the Council did not deem it advisable to make any special appeal on behalf of the Society should be made to the architectural profession; nevertheless, they have the satisfaction to report that many liberal donations have been received by the Society, and that several new names have been added to the list of subscribers.

Although the Society now possess 300 annual subscribers, the Council feel that this number is not sufficiently representative of the large body of architects practising in the United Kingdom; they are assured that there must be a large number of architects, not subscribers to the Society, who would be desirous of helping their less fortunate brethren, or their widows and children who have been left insufficiently provided for. The usefulness of the Society would be increased in proportion to the augmentation of its list of subscribers; and the Council would remind those who have not contributed to the funds of the Society that an annual subscriber of one guinea has the privilege of recommending two applicants for grants during the year, and that relief is always afforded to worthy and properly accredited applicants when there are funds available for the purpose. It is earnestly wished that the list of annual subscribers should be increased, and members of the Society might materially help in effecting this object by bringing its aims and work under the notice of their brother architects.

The amount received in annual subscriptions during the year was 456l. 10s., as against 453l. 8s. in 1896. Four members have withdrawn, and twelve members were in arrears with their subscriptions when the books were closed for the year; and the following gentlemen have recently become annual subscribers:—Sir Benjamin Baker, Messrs. J. Wallis Chapman, Charles Henman, Delessa Joseph, C. W. Lovett, E. W. Mountford, Alfred Williams, Latham A. Withall, and Alfred B. Yeates.

The capital account has been increased by the bequests of roof, each of Mr. David Mocatta and Mrs. Ann Mocatta, and by the following donations:—The Merchant Traders' Company 21l., John o'Gaunt Sketching Club 15l. 1s. 7d., Mrs. C. E. Barlow 12l., Mr. Wm. Emerson 6l. 13s. (thus bringing the total amount of his donations to roof), the Nottingham Architectural Society 5l. 5s. The following gentlemen have each made a donation of five guineas:—Mr. J. T. Christopher, Mr. G. Elkington, Mr. George Inskip, Mr. C. Henman, Mr. E. W. Mountford, Mr. W. Hilton Nash, Mr. J. Tavenor Perry; and various smaller sums have also been gratefully received.

At the beginning of the year there was a balance of 64l. 10s. 2d. to the credit of the capital account, and the amount of bequests and donations received during the year came to 300l. 17s. 7d. It was therefore decided to increase the Society's investments by the purchase of 200l. Caledonian Railway Four per Cent. Debenture stock, and the purchase was effected at a cost of 311l. 7s., thus leaving a balance to the credit of this account of 54l. 7s. 9d.

A larger number of applications for assistance than usual were made to the Society, and considered by the Council. After proper investigation in each case the sum of 607l. 1s. (as against 569l. 10s. in 1896) was distributed amongst forty-three applicants; and 70l. was paid to the Society's three pensioners.

As the exertions of successive Councils for many years have succeeded in bringing the amount of the invested capital up to 10,000l., your present Council consider that the Society might now increase its present list of three pensions of not less than 15l. a year each to six pensions of not less than 20l. a year each. The approval of this step would, the Council think, add to the happiness of deserving applicants by the knowledge that they were to receive annually a certain sum. A motion to alter By-law No. 65, so that the above proposal may be carried into effect, will, therefore, be submitted to you.

The Council have to record with deep regret the death during the year of Mr. W. J. Gardiner, Mr. Octavius Hansard, Mr. John Hudson, Mr. M. B. Teulon, Mrs. H. G. Mason, Mr. Stephen Salter, Mr. C. J. Shoppee, Mr. J. Loughborough Pearson, R.A., and Mr. Thomas Wells, all contributors to the Society.

The following gentlemen, being the five senior members, retire by rotation from the Council:—Mr. William Kidner, Mr. George Scamell, Mr. Zeph King, Mr. George Inskip, and Colonel Robert W. Edis. To fill the vacancies caused by these retirements, the Council have the pleasure to nominate Mr. E. W. Mountford, Mr. R. St. A. Roumieu, Mr. Wm. Woodward, Mr. E. B. l'Anson, and Mr. E. H. Martineau.

The Council, in closing their report, desire to express the indebtedness of the Society to the Royal Institute of British Architects for the use of rooms in which to hold their meetings, and to the officers for their always helpful courtesy."

The statement of accounts and balance-sheet was also read by Mr. Currey, and adopted.

The Chairman said that it was very desirable to obtain additional subscribers, and seeing that there were 2,000 members of the Institute and only 300 subscribers to the funds of the Society, it ought not to be difficult to do so. It was very gratifying to find that they had been able to increase the investments of the Society.

On the motion of Mr. H. Hall, seconded by Mr. J. T. Christopher, a vote of thanks was accorded to Messrs. Wm. Kidner, G. Scamell, Z. King, G. Inskip, and Colonel Edis, the outgoing members of Council.

On the motion of Colonel Edis, seconded by

Mr. H. H. Collins, it was agreed that the following gentlemen be elected on the Council for the ensuing year of office: President, the President of the Royal Institute of British Architects; Messrs. A. Crow, E. A. Gruning, G. T. Hine, Arthur Cates, Aston Webb, H. L. Florence, J. T. Christopher, Sydney Smirke, W. Grellier, E. W. Mountford, R. St. A. Roumieu, Wm. Woodward, E. B. l'Anson, and E. H. Martineau.

Votes of thanks, to Mr. W. Hilton Nash, the hon. treasurer, and Mr. Percival Currey, the hon. secretary, were also agreed to, and each gentleman was re-elected for the ensuing year as hon. treasurer and hon. secretary respectively.

On the motion of Mr. Currey, seconded by Mr. Hall, a vote of thanks was accorded to Messrs. T. Rickman and R. St. Aubyn Roumieu, the auditors; and Messrs. C. Forster Hayward and G. Lethbridge were then elected as auditors for the ensuing year.

Mr. Christopher next proposed, and Mr. Currey seconded, that the words "Six pensions of not less than 20l. each" take the place of "Three pensions of not less than 15l. each" in By-law No. 65.

After some discussion, this was agreed to unanimously, and Mr. Forster Hayward expressed his willingness to double his subscription in the hope that others might do the same, and so increase the funds of the Society.

Mr. Rickman proposed, and Mr. Currey seconded, an alteration in By-law 6, viz., to insert after the words, "or more," the following: "or an annual subscriber of two guineas or more." After discussion, this was agreed to by a small majority. It was stated that the alteration would have to come up for confirmation at a subsequent meeting, when, if necessary, further discussion could take place on the subject.

On the motion of Mr. H. L. Florence, seconded by Mr. Wimpey, a vote of thanks was passed to the Institute for the use of their rooms and for office accommodation.

Mr. Collins then proposed a vote of condolence to the family of the late Mr. J. Edmeston, a donor and subscriber to the funds of the Society, whose death had just occurred. The Chairman seconded the motion, which was agreed to.

A vote of thanks to the Chairman brought the proceedings to a close.

THE SANITARY INSPECTORS' ASSOCIATION.

At the March meeting of this Association, held at Carpenters' Hall on Saturday last, a paper was read on "The Inspection of Dairy Farms," by Mr. Skinner, of Brighton; Mr. G. T. Dee, Chairman of Council, presided. Before the reading of the paper, reference was made to a correspondence on the subject of the proposed appointment of an inspector at Battersea at a salary of 100l. a year, and of another at Hackney at 100l. a year. The Council of the Association communicated with the Local Government Board and the London County Council, praying that the necessary sanctions should be withheld in the case of appointments at salaries so inadequate. The London County Council had since had the matter under consideration, an opinion being expressed which accorded with that of the Association, but representing that it was a matter which rested with the Local Government Board and not with the London County Council, which, however, was justified in expressing an opinion because it would be called upon to pay a portion of the salaries.

The lecturer pointed out that the Infectious Diseases Prevention Act (1890) gave certain remedial powers in the London districts, but those powers could only be exercised in other districts after the adoption of the Act by the local authority concerned; and its adoption being optional, instead of compulsory, this salutary legislation was in too many districts inoperative. In making an inspection of a dairy farm, the water supply, the construction of cowhouses and milk stores, and the paving, drainage, lighting, and ventilation were among the chief points to be considered. While at some dairy farms the water supply was all that could be desired, there were others, particularly those of the smaller class, of which that could not be said. The water in many was obtained from shallow wells, insufficiently protected from pollution by surface washings, and sometimes the only available source of supply was

water collected in shallow roadside pits, while in other cases water was taken from the nearest running stream. The present cowsheds were generally low-pitched, ill-paved, badly drained, and badly lighted and ventilated. Light was most essential, and it had been decided that there should be an allowance of free air-space of at least 800 cubic feet for each cow accommodated.

THE SURVEYORS' INSTITUTION.

AN ordinary fortnightly meeting of this Institution was held on Monday, in the temporary premises of the Institution, Savoy-street, Victoria-embankment, Mr. T. M. Rickman, Vice-President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. William Irvine, Bengal Civil Service (retired), read a paper on "Land Survey and Valuation in Northern India."

In the course of his paper, the lecturer dealt with the system of field survey and the valuation of land, both for purposes of taxation and for the fixing of tenant rents, and after some historical remarks, he divided his subject into three parts—(1) measurements and maps; (2) statistical records and the assessment of land revenue; (3) fixing of rents between landlord and tenant. Of these divisions the first dealt with survey, the second and third comprised valuation in its two aspects. In regard to survey, he said that in "the early days from 1822 to 1842, the only scientific work consisted in an outline survey of the village boundary on a scale one-fourth of that now employed for the field survey. For this portion of the work a trained staff under European supervision was required, and out of this body, of which the heads were mostly officers of the Bengal Artillery, the present department of revenue survey was developed. Those outline maps were copied by hand; they showed, in addition to the exact outer boundary, the configuration in outline of the waste and cultivation. With these maps was furnished a combined map on a smaller scale for the whole district or for each sub-division of it. But before this or any survey could be attempted it was necessary to mark the village boundaries. The work of setting out the village boundaries falls to the revenue officials of the district. The native sub-collector visits the village and calls upon the head men to point out the boundary line. If there is no dispute, the triangulation points are marked temporarily by earthenware pipes, something in the shape of a drain pipe, and the intermediate windings by small heaps of earth. If all parties are agreed a signed paper is taken from the head men of the villages concerned, and the boundary marks are made over to their custody until the arrival of the surveyors. The permanent triangulation pillars are either of stone, 5 ft. or 6 ft. long and 1 ft. thick, or of brick about 3 ft. square and 2 ft. above the ground. It used also to be the custom to bury a pot of charcoal under the pillar, in order to afford evidence should it be knocked down by cattle or wilfully removed by the villagers. In a considerable number of cases, however, the position of the boundary is disputed. . . . These disputes must be decided upon evidence of possession, unless the parties will consent to abide by some particular map or by the decision of an arbitrator. The dispute is especially difficult of adjustment when the line runs through uncultivated land, or land under water. The repeated preparation of maps under renewed surveys has now made it possible to arrive in most cases at some conclusion satisfactory to the deciding officer, if not to the parties. But fifty years ago it was sometimes quite impossible to find on evidence how many feet one way or the other a boundary should be laid down across a piece of brown waste without one distinguishing mark, where one bush or one blade of grass was exactly the same as every other. The only resource left was to adopt some mode of trial by ordeal, which the superstitions of the villagers would lead them to respect. . . . After the boundaries are marked out comes the actual measurement." The author then referred to the agency employed for the combined work of (1) actual survey and map-making; (2) recording rights in land; (3) ascertaining the value of the land and fixing the Government dues. In the earlier period (1822-1842) the field-map was a mere sketch not drawn to scale, and thus naturally was treated as an entirely subsidiary part of the record and assessment work. Thus it fell without any question within the domain of the revenue officer. The native mode of

measuring was to take a bamboo pole, a knotted rope, or a chain round the four sides of the field, and then get out the area by certain formulae, the result of which was quite accurate enough for the purpose. From 1833 it became the rule for the surveyors to furnish these rough maps and the accompanying lists, giving the number of field, its position, the length of its four sides, the area, and the name of the tenant. When a renewal of operations became necessary, owing to the approaching expiration of the term of years for which the revenue had been fixed, occasion was taken to direct that the native field maps should be drawn to scale, 16 in. to the mile; and it was ordered that the surveying should, so far as possible, be done by the ordinary village accountants, who were to receive special training for the purpose. For twenty years this plan was pursued with varying success. In reality, most of the work was done by special men entertained temporarily by the village accountants. In some cases the maps were remarkably accurate, but between district and district the quality varied a good deal. As each district was taken up, a new establishment had to be extemporised for the purpose, and the quality of the out-turn was somewhat uncertain. The boundaries of two adjacent villages would sometimes be found not to coincide when their maps were compared, and the areas of waste land were often carelessly dealt with. In some cases where the assistant in charge under the revenue officer had received his early training in the Survey Department, he introduced a system of traverses which secured a check on the work and kept possible errors within narrower limits. Meanwhile the professional survey department, as time went on, began to find that its topographical and boundary map work was being exhausted, and if it could not find fresh fields, it stood a very good chance of being abolished. It urged its claim to be used for making the detailed surveys, which up to that time had been in the hands of the revenue officers. About 1875 a change was made, and under the name of the Cadastral Survey the work was confided to the Survey of India, of which it became a branch. The accuracy and the technical excellence of the maps were thereby vastly increased. The cost, however, was at the same time much added to. The old settlement survey cost Rs. 60, the Cadastral, about Rs. 132 per square mile. The author then described the Cadastral Survey, and in subsequent parts of his paper he dealt with the definition of a survey "field," record work, assessment of the land tax, the system of 1868-1883, the percentage of assets taken, rent rolls, the new rules of 1885, recent modification of survey and record, fixing rent between landlord and tenant, and annual village accounts.

Mr. Daniel Watney proposed a vote of thanks to the lecturer, which was seconded by Mr. J. H. Sabin.

A short discussion followed, in which Sir E. Jenkinson and Messrs. Howard Martin and H. C. Newmarch took part.

The vote of thanks having been passed, and Mr. Irvine having replied, the meeting terminated.

COMPETITIONS.

LUNATIC ASYLUM, NEAR BIRMINGHAM.—The whole of the plans prepared by the six selected architects in competition for the new lunatic asylum which the Corporation propose to erect at Holly Moor, near Rubery, have been deposited at the Council House. The names of the competing architects are Messrs. Cossins, Peacock, & Bewlay, Messrs. Mansell & Sons, Messrs. Ingall & Sons, Messrs. Cross, Brookes, & Nicholls, Mr. Frank B. Osborne, and Messrs. Martin & Chamberlain. Before making a final selection the Asylums Committee will take the advice of Mr. G. T. Hine, of London, the Consulting Architect to the Commissioners in Lunacy.

BIRMINGHAM CLERKS OF WORKS ASSOCIATION.—The annual dinner of the Birmingham Clerks of Works and Builders' Foremen's Association was held at the White Horse Hotel, Congreve-street, on the 1st inst. County Alderman John Bowen, in responding to the toast of the honorary members, congratulated the Association upon its success. The Association must be of great service to the building trade of Birmingham, and he reserved the support of the Master Builders' Association. Mr. Whitall, vice-president, endorsed the views of Mr. Bowen. Mr. Cummings proposed "The Health of the Officers," and Mr. Patchett, the President of the Association, responded.

Books.

Quantity Surveying, for the Use of Surveyors, Architects, Engineers, and Builders. By F. N. LEANING. Third Edition. London: E. & F. N. Spon. 1897.

THIS third edition, of a now well-known work, is considerably more than a reprint of the former edition, having been considerably amplified in various chapters; the more important items being the examples of "Billing" following the descriptions of the modes of measuring the various works. Some of them are so obvious, that we think the illustration was hardly necessary, and, in some cases, there will be a wide diversity of opinion as to the examples shown. In our opinion, the practice of "setting in" the labours following an item, as given on pages 70 and 71, is somewhat dangerous; in fact, we have known instances of such items being missed in the hurry of pricing. While, of course, the builder should carefully read down the whole of the bill, the form of the bill should be such as to leave no possibility of such an error. These items, in a proportionate degree, being as much importance as those which follow. In the example given of asphalt paving, we do not see the reason for setting the "94 ft. run extra labour forming gutter, and giving the "70 ft. run extra for forming channel 6 in. wide" the more dignified position of the "feet" column, unless in the latter case, the item is for "extra labour at materials." If so, it should have been stated.

The directions for measuring masons' work—the *pons asinorum* of the young surveyor—have been usefully amplified, as well as the chapter on pricing.

The chapter on "Law" is useful as a help in defining the position of the quantity surveyor, although that is still somewhat unsatisfactory. Most surveyors will, we think, agree with the author, as to the advisability of making quantities part of the contract.

With regard to the general contents of the work, the book is so well known that these need not call for any special notice.

Electrical Installations, for Architects, Builders, Surveyors, Civil Engineers, &c. By F. WARDEN-STEVENS, A.M.I.E.E. London: Gilbert Wood.

In this small book the author has endeavoured to give those facts connected with the generation and supply of electricity for lighting purposes which it would be advantageous for architects and others who have to advise their clients to know. The matter treated is of general interest, but the very condensed form in which the information is conveyed, together with a certain want of perspective in arranging the matter, considerably detracts from its value. In the first forty pages of this book, engines, boilers, dynamos, accumulators, buildings, &c., are illustrated and described, and a certain amount of theory is given. To the general reader very little knowledge will be gained by reading about "the characteristic of a series-dynamo" and "armature reaction"; in talking about the "characteristic" instead of the "characteristic curve" would only mislead him.

Some people would be puzzled on reading the following: "It is obvious that in an installation the positive cable will be attacked and corroded if there is the slightest leakage. The same chemical and electrical laws applying to this as to accumulators." It is most certainly very far from being obvious, and a statement like the above would only lead the general reader to draw most erroneous conclusions.

A few notes on working installations are given, which are good as far as they go, but they are utterly inadequate to be of any use. They give one the impression that it is always unlimited assistance forthcoming in the shape of unskilled labour at every installation, which, with the help of a few hints, will be able to replace the ordinary mechanic. Considering that the author states in his introduction that a competent consulting engineer should always be called in, it seems out of place that advice should be given how to do particular parts of the plant. Either the whole process of erecting should be given or it should be left entirely to the consulting engineer.

The chapter on wiring is good, and Mr. Warden-Stevens' graphical methods of

ing the relative costs of electric lighting in public and private supply are to be considered.

Law and Practice of Compensation. By J. C. RICHARDS and JOHN H. P. SOPER, Barristers. London: Frank P. Wilson, Estates Gazette Office, and Sweet & Maxwell. Every year property in land has to be taken for some public or general purpose, and compensation is accordingly claimed by the owners of such property. The principles on which it is based are now pretty well understood, and can be stated concisely. On the other hand, the large number of cases which have been decided either by arbitration or by juries give some kind of rough guide to the probable result of a trial as to the amount of compensation. It is the practical aspect of the question which is chiefly treated of in this book. The legal principles and the Acts of Parliament are clearly and concisely stated, numerous forms are given, and there is an appendix of specimen cases. The last appendix consists of a list of compensation cases and in London and the provinces, which have been reported in the *Estates Gazette*. We think the authors were mistaken in inserting an appendix; it occupies from page 524 to 589, and unnecessarily increases the size of the book. It would be all very well to issue such a document to subscribers to the above journal. The list of specimen cases is interesting, though reports might, perhaps, have been analysed, and something less detailed have been printed. The differences of opinion expressed by experts are striking. Thus in the case of *Onslow v. Woking District Council*, a claim of 13,000*l.* was made in respect of the taking of a certain land for the purposes of a sewage farm for depreciation to the rest of the property. It was contended for the Council that the estate was not building land, and the witnesses for it that the proper compensation at from 3,000*l.* to 5,000*l.* The umpire awarded Lord Onslow 500*l.* What at once strikes an impartial person is that there should have been no question as to whether or not the land could properly be considered as building land. It is necessary to criticise this book at length, it is a useful and handy publication which will be of a convenience to all who are interested in the subject of which it treats.

Elementary Physics, Practical and Theoretical—First Year's Course. By JOHN G. KERR, M.A. London: Blackie & Son, Limited, 1898.

WITH so many good works on elementary physics already in existence, it is not to be expected that any author is able to produce a startling result in writing a new book on the same subject. But Mr. Kerr has at least succeeded in presenting many elementary physical problems in an attractive and sympathetic way for the young student, and is eminently practical throughout. The simplicity of this little book in dealing with such subjects as "measurement of length," "of area," "of volume," "of mass," is admirable. One of the chief drawbacks to the average modern book on elementary physics is the general tendency on the part of its author to suddenly plunge into mathematics in or near the opening chapters. This wears and startles the young student, and shows that the writer is not in touch with the material he desires to mould. Mr. Kerr is evidently a man of more experience, and that little mathematics he introduces is gradually and insensibly led up to. The principles of the beam balance are carefully explained, and the measurements of time and force have two chapters devoted to them. The angle and the parallelogram of forces, the inclined plane, centre of gravity, velocity and acceleration, relative density, pressure, and other kindred matters are proportionately cognised. The book is divided into two sections: (1) Laboratory work, and (2) Classroom work; and there are corresponding chapters in each section for any one subject treated of. The only exception we take to the general observations in this excellent little treatise is the statement that in doing the laboratory work the "number of sets of apparatus need not exceed half the number of pupils, and in many cases it will be found sufficient to arrange for four pupils to one experiment." Our experience is that in elementary science demanding some little piece of apparatus for its effective demonstration, it

is better that only one student shall operate at a time with any particular appliance. A common blunder on the part of such "educational bodies" as the Science and Art Department and certain of the County Councils, is to lay down a curriculum, or to aid and abet one, in which practical work is a principal feature, and then, by refusing to provide sufficient apparatus, to make it impossible for the teacher to satisfactorily carry out the course of instruction laid down.

Proposed Revolution in the Science of Meteorology. By W. G. WENLEY. Chelmsford.

THIS is one of those marvellous productions, the "outcome of the highest phase of advanced modern thought," which is destined, in course of time, to revolutionise scepticism and to change the face of Nature. The present methods of forecasting weather are all wrong—the only man who really understands the matter is the writer of this pamphlet. The barometer is maligned when it is stated to indicate "much rain," "set fair," &c.; it has no intention to indicate anything of the kind. It does not go "up" or "down," or send a hand round a dial in obedience to the weather. If you take one "to the top of St. Paul's, it will fall $\frac{1}{16}$ of an inch; if brought down it will rise as much; and this it will do 50 or 500 times in a day if carried up and down so often." This is an "illustration of its proper office." The Dean and Chapter should widen the staircase to the top, and then give notice to her Majesty's judges—the treadmill is out of date. The fault of meteorologists hitherto has been that they have not given sufficient attention to the effect of gravitation upon the air. "This Cinderella of the sciences is not less, but more, beautiful and beneficent than either of her older and rather haughty sisters." All sorts of authorities are cited, including "Chambers' Encyclopedia," "Mrs. Somerville," "Admiral Fitzroy," "the Captain of H.M.S. Porcupine," "Whitaker," the "Nautical Almanac," &c., and even such phenomena as the eruption of Krakatoa, the tallow candle, and the switch-back railway, are not neglected. We recommend this revolutionary project to the notice of the Admiralty, the Meteorological Office, and the County Council—it explains many difficulties, and is full of useful hints.

The Gas Engineer's Pocket-Book: comprising Tables, Notes, and Memoranda relating to the Manufacture, Distribution, and Use of Coal Gas, and the Construction of Gas Works. By HENRY O'CONNOR. Crosby Lockwood & Son. 1898.

ALTHOUGH intended primarily for the gas engineer, this book will be found a useful work of reference by all interested in lighting or heating by gas, while the collection of the analyses of the various descriptions of gas will be of value to the technical chemist.

All matter in any way connected with the manufacture and use of gas is dealt with, from the methods of clearing choked ascension pipes to the mathematical tables required in the drawing office.

The following table, giving the consumption of gas per head of population, is of general interest, although its interpretation will probably largely depend upon the reader's attitude with regard to the use of gas:—

London	5,000 cubic feet.
England	2,450 "
France	560 "
Germany	350 "

The book is not free from errors, for on pages 331 and 332 the formula CO_2 is used where it should be CO , and on page 354 the quotation "806 grains should be 8096 gram; as a whole, however, it has evidently been carefully compiled and printed, and reflects credit on both author and publisher. Possessing a copious index, which in a work of this description is of the utmost importance, the pocket-book certainly constitutes a useful addition to gas literature.

TRADE CATALOGUES.

THE Hartshill Brick and Tile Company send us their illustrated catalogue of terra-cotta roofing tiles, finials, crosses, &c., red blue and buff-coloured paving tiles, encaustic and glazed tiles, ornamental terra-cotta panels, &c. A special feature in the make-up of the catalogue is that the numbers and prices of articles on each page of illustrations are printed in

schedule form on the facing page, a matter of great convenience in giving orders for goods.

—Messrs. Steel & Garland send us their illustrated catalogue of the different designs of their Marlborough Ventilating Grate for schools, hospitals, and public buildings. A section of the grate, for those who are not acquainted with its construction, is given on the back of the catalogue. In this case one has the rare pleasure of being able to give general praise to the designs shown in a trade catalogue—a pleasure we wish we had oftener. They are all in good taste, both in general line and in detailed treatment. There is not much ornament, and what there is is quiet and unobtrusive in style. No. 1,476 would be better without the flagrares in the angles, No. 1,121 better without the ornament (cast, we suppose) round the opening; but for the most part these are designs which will afford a satisfactory selection for an architect. Among the grates illustrated is the "Adjustable," which can either be used as an open well fire or as a bar-grate; the bars arrange to be raised or lowered at pleasure.

BOOKS RECEIVED.

DESASHAH: Fifteenth Memoir of the Egypt Exploration Fund. By W. Flinders Petrie. (Kegan Paul & Co., and B. Quaritch.)

THE STANDARD ELECTRICAL DICTIONARY. By T. O'Connor Sloane. (Crosby, Lockwood & Son.)

OCCASIONAL PAPERS, Association of Surveyors of H.M. Service. (Inverness: R. Carruthers & Sons.)

SPONS' ARCHITECTS' AND BUILDERS' PRICE-BOOK. By W. Young. (E. & F. N. Spon.)

THE CATHEDRAL CHURCH OF NORWICH. By C. H. B. Quennel. (Geo. Bell & Sons.)

THE CATHEDRAL CHURCH OF PETERBOROUGH. By the Rev. W. D. Sweeting. (Geo. Bell & Sons.)

Correspondence.

To the Editor of THE BUILDER.

"DESIGN AS INFLUENCED BY CIRCUMSTANCE."

SIR,—In your critical but generally appreciative article upon my book, "The Bases of Design," in quoting from the opening paragraph you make me say, "We should be tracing the cause of human thought and history themselves" (in tracing the history of design). The word I use is *cause*, however, which makes some difference to the sense.

I will not venture to traverse the opinions which you express upon questions of opinion, whereon we mostly differ, but perhaps you will allow me a comment on one point—that of the question of the origin of the pointed arch. In speaking of the "actual birth of the pointed arch," I must not be understood as speaking of the actual historic or constructive origin.

It will hardly be disputed, I presume, that the interlacing semi-circles of the transitional arcade actually demonstrate, or define, the form of the early pointed, or lancet, arch? This, at any rate, was quite sufficient for my purpose, which, as stated previously (on pp. 5), was "to trace the influence of the main types (of architectural form) in determining the form and character, and controlling spaces and lines of the decoration, both surface and sculptured design, which accompanies them."—I am,

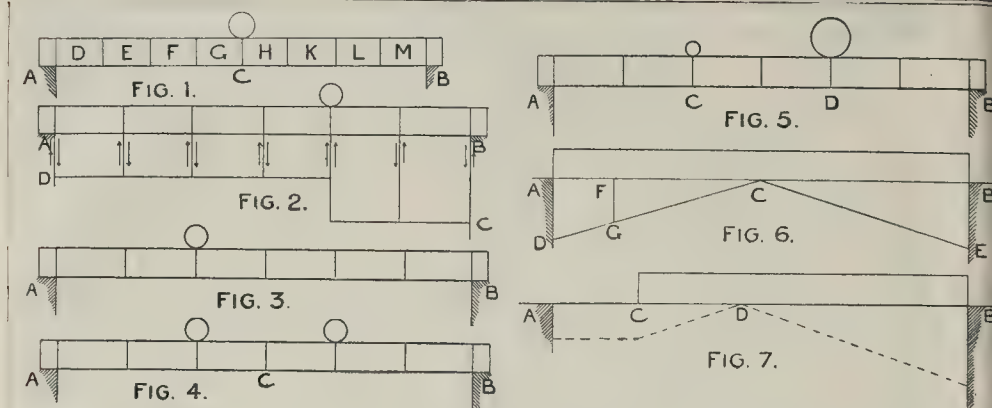
WALTER CRANE.

13, Holland-street, Kensington.

March 6, 1898.

* * "Cause" for "course" was a printer's error which escaped notice. As to the question of the interlacing round arches, we must still think that the words, "the actual birth of the pointed arch," will convey the impression to most readers that this interlacing of round arches was its real origin; and this is such a complete fallacy, and has been unfortunately so often repeated, that we regretted to see language used which is calculated to confirm the idea in the popular mind; and if Mr. Crane's interesting book reaches a second edition, we hope this passage will be altered.—ED.

THE LATE SIR WOLLASTON FRANKS.—We understand that the Fellows of the Society of Antiquaries are invited to subscribe for a bust, to be placed in the Society's rooms, of Sir Wollaston Franks, and that Mr. Charles J. Praetorius has already modelled in wax a profile portrait, based upon some sketches in his possession. It is proposed, further, to present a replica of the bronze bust to the British Museum, of which Franks was an *ex-officio* trustee, and to which he was so generous a donor out of his own collections.



The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XI.

WHEN a loaded beam rests upon two supports there is—besides the tendency to bend under the load which we have been considering—also a tendency for the vertical downward action of the load, and the upward vertical reaction of the support to cut or shear the beam in a vertical line. And although in practice beams rarely fail by shearing, save when they are heavily loaded close to the points of support, the vertical forces which tend to produce shearing exist in all beams whether of solid or open and trussed construction. It is a common practice in the case of iron and steel beams to regard the web as resisting the shearing stress, and the flanges the longitudinal compressive and tensile stress, and, although not strictly correct, this assumption is sufficiently near the truth for practical purposes.

We may therefore proceed to investigate the nature of the shearing stress coming upon a beam. If we suppose in the diagram (fig. 1) AB to represent a beam supported at points A and B, and loaded with a central load at C, and suppose also that the beam is divided into a number of slices, D, E, F, G, H, K, L, M, then if we consider the relations of the two adjoining slices, H and K, we may assume the slice H to be pressed downwards by a portion of the load which goes to the support B, whilst its neighbouring slice K is pressed upwards by the vertical upward reaction of the support B. There is, therefore, a vertical stress equal to half the load tending to shear the beam across on the vertical plane separating the two slices H and K. A similar shearing stress exists between K and L, and between L and M, and as the downward pressure upon the support B is unchanged between C and B, and the vertical reaction of the support is also unchanged, it follows that the shearing stress is equal between each pair of slices. Similarly with the slices between C and A; it follows therefore that the central load upon the beam supported at both ends causes a uniform shearing stress equal to half the load throughout the beam.

Between the slices G and H, on the central line of the beam, there is no shearing stress, because these sections evidently have no tendency to slide past each other.

A single concentrated load produces its greatest shearing stress when placed on one end of the span of the beam immediately over the edge of a support. In this case the shearing stress is then equal to the load, but there is no shearing stress in any other part of the beam. If we consider the load moved along the beam, then the shearing stress in front of it increases uniformly, and behind it decreases uniformly, until the load reaches the other end of the beam, when we again have it in the position that produces the greatest shearing strain, but on the opposite side. Thus, in the examples shown in figs. 2 and 3, where the concentrated load is not at the centre of the beam, the upward reactions of the supports are consequently unequal, and therefore

also the shearing stresses in the two portions of the beam. We may represent this graphically, as in fig. 2, B C representing, to any scale we please, the reaction of the support B, and A D the reaction of the support A. Then the shearing strain, at any point in the beam, can be measured as shown.

In fig. 3 we have a similar arrangement, but with the load nearer to the support A than B. As we have already explained in Chapter IX., the reaction of either support is equal to the load multiplied by the distance from the centre of gravity of the load to the other support, and divided by the whole span, and the shearing stress is, as we have already seen, equal to the reaction of the support. In fig. 4 we have two concentrated loads of equal weight, and each placed at the same distance from the support, and it might be supposed that the shearing stress at any point might be found by adding together the stress at that point under the conditions of fig. 2 to the stress under the conditions of fig. 3; but this is not the case, except for those points between a support and the load nearest to it, inasmuch as the vertical forces at any such point are in the same directions, and thus combine in their effect; but at any point between two loads the vertical forces act in opposite directions, and consequently counteract each other. This we shall see clearly if we consider the tendency to motion of the slices on either side of the central line. In fig. 2 the slice on the right hand of the central line being nearer to the weight, tends to slide downwards past that on the left hand of the central line, whilst in fig. 3 the reverse is the case, so that in fig. 4, where we have a combination of the figures 2 and 3, these equal and opposite shearing stresses counteract each other, and there is consequently no shearing at C.

Again, if we were to suppose the loads in fig. 2 and fig. 3, instead of being equal, to be unequal, and combine them as in fig. 5, we should see that the shearing stress in C D is equal to the difference between the shearing stresses in the corresponding portion of the beam when loaded with one or other of these unequal weights.

From these cases which we have considered, we can, therefore, deduce the following rules:—The shearing stress at any point of any beam fixed or supported at one or at both ends and loaded in any manner, is equal to the difference between the upward vertical reaction of either support and any load on the beam between the point selected and the support. Again, if we suppose that the part of the load to the right of any particular point in the beam be called B and that to the left of it A, then the shearing stress at that point will be equal to the difference between that portion of B that goes to the left-hand support, and that portion of A that goes to the right-hand support.

In applying these rules to a point immediately under a concentrated load, it would be theoretically correct to consider the line immediately under the point of application of the load as the dividing line between the two portions of the concentrated load, which go to the two supports respectively; but in practice it is safer to consider the shearing stress immediately under the load as equal to the greater of the two shearing stresses on each side of it.

From the above it follows that with an even distributed load over a beam the shearing stress is greatest at the supports, at each of which is equal to half the load; from each support it diminishes uniformly to the centre, where it is nothing. We can, therefore, readily determine graphically the shearing strain at any point we please in the beam by drawing to scale A, D, B, (fig. 6), to represent the shearing stresses at each support, joining lines from D and E to the middle point C of the beam, and measuring the vertical height F G on the same scale as before, which will give us the shearing stress at the point F.

The same principle may be applied in the case of a beam uniformly loaded from one of its supports, as in fig. 7, although the working is not perhaps quite so simple. In such a case, we suppose a beam A B to be loaded from C to B, the greatest shearing stress is at the support B, and is equal to the portion of the load borne by that support. From that point it decreases uniformly to nothing at a point A, which is always within the load itself. To find this point we adopt the same expression as that for finding the greatest bending moment which is at the same point as the least shearing stress in the beam. Thus:—

$$AC = \frac{CD^2}{2AB}$$

From the point D the shearing stress again increases uniformly to the point C at the same rate of increase as from D to B, and from A to the support A the shearing stress is equal to the portion of the load supported at C, as shown by the dotted line in fig. 7.

OBITUARY.

MR. JAMES EDMESTON.—We regret to record the death of Mr. James Edmeston, a well-known architect in the City, and one of the oldest members of the Institute of Architects, of which he was elected an Associate in 1856, and a Fellow in 1859. Mr. Edmeston was also a Fellow of the Surveyors Institution. He had also been one of the original members of the "Society for the Encouragement of the Fine Arts," in which he took much interest. He was also a member of the Common Council, a Deputy for Broad-street Ward, and took much interest in questions connected with the architectural treatment of the City of London.

MR. ARCHIBALD BINNIE ALLAN, C.E.—Mr. A. I. Allan, C.E., the Borough Surveyor of Govan, whose death is announced, was the son of Mr. Hugh Allan of the late firm of Allan & Mann, brickmakers, builders, and contractors, Glasgow. He was the grandson of Mr. James Allan, for many years manager of Govan Colliery, and was a pupil of Professor Rankine at Glasgow University, where he carried off the second "Walker" prize for an Oral Examination, and took his certificate as a Civil Engineer in 1870. He was afterwards an office pupil of Mr. MacLure, Civil Engineer, Glasgow, whence he went to the Office of Public Works at Glasgow. While connected with that office, he read a paper before the Society of Civil Engineers at Glasgow, strongly advocating the establishment of public standards of measure for the verification of surveyors' chains and tapes, a suggestion which was carried out by the civic authorities. In 1880, Mr. Allan was appointed Borough Surveyor of Govan—a post to which he was warmly recommended by his father before the Society of Works, Mr. John Carrick; from which time he may be said to have devoted his life to the interests of that Borough. An article in the *Govan Press* speaks in very high terms of his character and ability.

GENERAL BUILDING NEWS.

PROPOSED NEW CHURCH AT SANDYLANDS, MORECAMBE.—Messrs. Austin & Paley, Lancaster, have prepared plans for the proposed new church at Sandylands. The site is at Cross Cop, on the Lancaster side of the road. The church will provide seating accommodation for 450 persons.

PROPOSED NEW CHURCH AT NEW HARTLEY, EWCASTLE-ON-TYNE.—In connexion with the proposed new church at New Hartley, the first committee meeting has been held, when the plans of J. Robinson, of Seaton Delaval, were submitted and agreed to.

NEW CHANCEL AND ORGAN, ST. JOHN'S CHURCH, MONKSTOWN, DUBLIN.—On the 1st inst. new chancel, organ, and other additions to St. John's church, Monkstown, were dedicated. The chancel has been lengthened 12 ft. The work in connexion with the church itself was designed by Mr. R. Mulfield Orpen, and executed by Mr. R. E. Mellon, of Rathgar. The organ was built by Messrs. P. Onnacher & Sons, of Huddersfield.

RESTORATION OF DOVERCOTT CHURCH.—This church has just been reopened after restoration, the architects for the restoration being Messrs. J. E. K. J. P. Cutts. During the progress of the work several old and interesting architectural features have been brought to light. In the chancel it was found that the windows had at some period been altered in shape and design. Two small windows east of the old chancel-screen have been opened, having been only roughly filled in at the beginning of the present century. Just west of the chancel arch is another low window, which also was blocked up about 1811, and has now been reopened. These two keys, with regard to the extent of the restoration, the roof has been retiled and the stone masonry and cross at the east end renewed. The gilding has been removed, and the old oak timbers of the roof uncovered. A false wall of lath and plaster, which ran the whole length of the church, on east to west on both sides of the interior, has been removed. Three new windows have been opened up and filled with stained glass. The old stone steps leading up to the thickness of the wall on the roof-screen have been revealed, and the stone joints of the windows have been restored. The church has been re-roofed and also the vestry, and the thing that now remains to be done is the re-tiling of the old tower. A new organ by Messrs. J. P. Onnacher & Sons, of Ipswich, has also been provided.

DIOCESAN CHURCH HOUSE, ABERDEEN.—A new church house is to be erected in Dee-street by the Aberdeen Diocesan Association. At present only a part of the whole scheme is to be proceeded with, including Dee-street, on the ground floor, there is a library and a committee-room. On the first floor, occupying the whole of the frontage, is what is known as the Suther Memorial Hall, which will provide accommodation for 180 persons. On the second floor are billiard, card, and committee rooms, and on each of the floors there are cloak-rooms and a lavatory. The basement floor contains a caretaker's rooms. The estimated cost of the work to be proceeded with is 1,600l., and the total cost of the completed building 4,000l. The architect is Mr. J. H. Clerk.

CHURCH, MITCHAM.—At Killicks-road, Mitcham, the 26th ult. the foundation stone of the new church of St. Mark was laid. The church will comprise nave and aisles, north and south transepts, baptistry, north porch, and a small bell turret. The architects are Messrs. R. M. Chart & Son, of London and Mitcham; and the contractors are Messrs. D. Stewart & Sons, of Waverington. The amount of their contract for the first portion (nave and aisles), exclusive of furnishing and heating, is 3,390l.

BAPTIST SCHOOLS, CARDIFF.—The new Baptist schools at Albany-road, Cardiff, were opened on the 1st inst. The building is in the Renaissance style. The schoolroom is carried up with three gables, and is built with Newbridge stone and Bath stone. The schools consist of a large schoolroom 55 ft. by 34 ft., with a vestry-hall at one end separated from the main schoolroom by a folding partition. It is intended to hold services in this schoolroom until the church is erected, and for this purpose a rostrum and baptistry have been provided. The schoolroom is carried up with three gables, and is built with Newbridge stone and Bath stone. The buildings were erected from the designs, and under the superintendence of, Messrs. Habershon & Winkler, architects, Cardiff. The contract amounted to 2,300l.

SCHOOL ACCOMMODATION, FEATHERSTONE.—Plans for a new school for the Featherstone School Board have been prepared by W. H. Fearrill, architect, Featherstone, for the accommodation of 450 children.

SCHOOLS, QUANTON, BUCKS.—New schools are to be erected at Quanton, to accommodate 206 children, at a cost of 1,747l. The designs, selected

in a limited competition, have been prepared by Messrs. W. F. Taylor & Son, of Aylesbury and Thame. The contractors are Messrs. King & Cannon, of Quanton, who have already entered upon the work.

HOSPITAL FOR HERTFORD, WARE, AND HODDESDON.—A hospital has been built at the joint expense of the towns of Hertford, Ware, and Hoddesdon, and the rural parishes which are comprised within the Hertford and Ware Unions. The site, which comprises about eight acres, is situated at Galloway Hill, about a mile from Hertford. The hospital consists of three pavilions. The centre pavilion provides four beds for diphtheria; and each of the others comprises two wards, and provides ten beds, for the treatment respectively of typhoid and scarlet fever. Besides the wards, in each pavilion there is a nurse's room, bath-room, store, &c., and the central pavilion has a verandah roofed in with glass. Separate from the pavilions is the administrative block, a building of three stories. On the ground floor there is the surgeon's room, a laboratory for the use of the medical officer of health, matron's sitting-room, nurses' mess-room, kitchen, scullery, larder, store, &c. On the first floor there are seven bedrooms, a bath-room, and store-room, and on the second floor two bed-rooms. The laundry is situated at the back of the pavilions. The hospital is constructed of brick. The architect is Mr. W. L. Grant, of Sittingbourne, and the builders are Messrs. Ginn & Son, of Hertford, whose contract was for 5,454l. Mr. J. Fitter, of Tottenham, has acted as clerk of the works.

NEW BLOCK, THE DELANCEY HOSPITAL, CHELTENHAM.—On the 5th inst. the new diphtheria block which has just been added to the Delancey Hospital, Cheltenham, was opened. The new block is isolated from the main building, and is built of Stonehouse bricks, with Bridgewater tiles for the roof. The ground plan is 66 ft. by 34 ft., the total length, with offices, &c., being 88 ft. The accommodation provided consists of three wards for two beds each, 24 ft. by 12 ft., and 17 ft. high; convalescent ward, 24 ft. by 12 ft.; nurses' room, bath-room, store, &c., arranged round a corridor 6 ft. wide. Messrs. Middleton, Prothero, & Philloft were the architects; and Messrs. Collins & Godfrey the contractors. The total cost will probably reach 2,500l.

WORKHOUSE INFIRMARY, WARRINGTON.—On the 24th ult. the foundation-stones of the new workhouse infirmary at Warrington were laid. The new infirmary, which is in close proximity to the workhouse, will have accommodation for 200 beds. The contractor is Mr. C. W. Davenport, of Stockton Heath, and the architects are Messrs. William and Segar Owen, of Warrington. The present contracts deal with three large blocks of buildings standing some 70 ft. apart, but connected on each floor with open-air corridors 10 ft. wide. The central will be the administrative block, three stories high, and the two outer blocks will be ward pavilions, each two stories high. Under the whole of the buildings there will be a basement for access to heating and water-pipes, &c. The administrative block will give accommodation on the ground floor for the medical officer, head nurse, dispensary, waiting-room, nurses' sitting and dining-rooms, linen and other stores, and on the first and second floors there will be bedrooms and other apartments for the housing of the nursing staff, and each floor will be fitted with baths, lavatories, &c. The public entrance will be in the centre of the administrative block. The other two blocks, one for males and the other for females, each accommodate ninety-two beds, or a total of 184. In each block there will be two wards of twenty-four beds, and six wards of two beds each. The pavilions will be about 240 ft. long. There will also be ward kitchens, linen-rooms, separation lobbies, and lifts. All wards will be heated by open fireplaces, or central open fire. Musgrave stoves, but in every case the heating will be augmented by hot-water pipes or radiators. The floors will be fireproof of Messrs. Homan & Rogers' construction. There will be an outer stair of iron. Externally, hard grey brick will be used, with terra cotta and red-pressed brick dressings.

PROPOSED SANATORIUM, GOSPORT.—The contract for erecting this building has been given to Mr. John Croad, of Gosport. There will be three distinct buildings, the hospital itself being quite apart from the administrative and laundry blocks. Internally there will be two distinct hospitals, each having an entrance of its own. Altogether there will be room for sixteen beds. Separate wards for men, women, and children, will be provided at both ends of the building; that at the western end for women being 30 ft. in length by 22 ft., and containing five beds, while that for men will be 22 ft. by 16 ft., and will contain two beds. The eastern end will be similarly arranged, the exception being that the women's ward will be 19 ft. in width, for three beds only. Nurses' rooms are also provided, and a verandah, 40 ft. long by 10 ft., will surmount the necessary offices. In the administrative block will be a nurses' sitting-room on the first floor, a second story furnishing two large and three small sitting-rooms, with an attic floor above. Mr. G. E. Bolshaw, of Southampton, is the architect.

INFIRMARY, MELKSHAM, WILTSHIRE.—At the workhouse of the Melksham Union an old building intended for infectious diseases has been entirely remodelled, at a cost of 1,260l., according to the

designs of Mr. Walter W. Snailum, architect, Trowbridge. The building is now practically a modern infirmary for thirty patients. Mr. Linzey, of Trowbridge, was the contractor.

PROPOSED ALTERATIONS TO CLAYTON HOSPITAL, WAKEFIELD.—Plans of the proposed works at this hospital have been prepared by Mr. W. Watson, architect. They have been approved by the Hospital Committee, and adopted by the City Council. The consulting rooms are to be enlarged, a new mortuary is to be erected, and a new laundry is to be built.

PROPOSED NEW MUSIC HALL AND CIRCUS, BIRMINGHAM.—It is proposed to erect on a plot of ground adjoining the Inge-street extremity of the Assembly-rooms in Hurst-street, a hall, which it is intended to use not only for concerts and theatrical performances, but also for equestrian entertainments. The hall will be 114 ft. long by 94 ft. wide, the floor being sunk below Inge-street to the basement level, and so arranged that the centre may be used as a circus arena. The stage, 30 ft. wide by 25 ft. high and 10 ft. deep, will face Inge-street side, and in addition to a promenade running completely round the floor, there will be a balcony extending along three sides of the building, and terminating close to the proscenium. There will be three entrances in Inge-street, and another—by means of a basement corridor extending under the Assembly-rooms—from Hurst-street. The floor is to be so constructed that, if necessary, the circus base may be instantaneously lowered and filled with water. The building will be of red brick and terra-cotta. The architect is Mr. F. W. Lloyd, of Birmingham.

PALACE THEATRE, BLACKBURN.—This theatre, the erection of which is shortly to be commenced, will be situated at the Jubilee-street end of the boulevard, directly opposite the railway station. The theatre will give accommodation for about 2,500 people. The building will be erected and completed under the superintendence of the architects, Messrs. J. T. Wimpey & Arber, of London.

PROPOSED TECHNICAL SCHOOL, DUNFERMLINE.—It is proposed to erect a technical school at Dunfermline, from plans prepared by Mr. D. Barclay, Glasgow. It will be a plain rectangular block of three stories, measuring 100 ft. by 62 ft. The lower floor, which will be partly basement, is to have a height of 12 ft., and here will be provided accommodation for forty-two joiners' benches, besides turning lathes. In another part on the same level will be a workshop in which working in iron and other metals can be taught. There will also be an engine-room with electric dynamo, it being proposed to have the building lighted with electricity. The ground floor proper will be 6 ft. above the entrance level. It will have a large room, which may be divided into three by two sliding partitions. Here engineering and weaving will be taught. The top story will consist of a suite of art-rooms, and a chemical laboratory, with lecture-rooms, teachers' rooms, and cloak-rooms.

PUBLIC BATHS, MORECAMBE.—Plans have been prepared by Mr. T. A. Fitton, architect, of Manchester and Morecambe, for the conversion of the ground floor of the Lyric Theatre, in Morecambe-street, into public baths. It is proposed to retain the rooms above as a hall in which to hold entertainments. The front entrance-hall and staircases will remain as at present. At the entrance on the ground floor an attendant's ticket-box will be provided on the left-hand side. The present double row of iron pillars in the centre supporting the floor above will be moved back to allow of a large plunge bath, 40 ft. by 25 ft., being constructed in the centre. The bath is to have a depth of 5 ft. 6 in. at the deepest end, and 3 ft. at the shallowest. On the right side of this there will be a row of eleven dressing-boxes, and on the left side and end twelve slipper-baths. Over these will be a seated balcony all round. Over this again, on the right side, will be provision for an additional row of dressing-boxes if required. In the basement, at the back, a boiler-house, laundry, and drying-room will be provided. Ante-rooms and a proscenium will be erected at the stage end. It is also intended to improve the front elevation to the street. The premises are to be warmed with hot-water apparatus throughout.

NEW HOME FOR NURSES, LIVERPOOL.—About eighteen months ago the erection of a new home for the nurses of Brownlow Hill Workhouse was commenced at the north-east corner of the present workhouse site, immediately adjoining the old building. The new structure is now almost completed. The estimated cost of the home, which will allow of the residence of sixty nurses, is 11,350l., inclusive of furniture and fittings. The building, which has been designed by and erected under the supervision of Mr. Henry Hartley, architect, Liverpool, comprises basement, ground, first, and second floors. The basement contains a dining hall at the west end 51 ft. 6 in. by 29 ft. 6 in., with lavatory, cloak-rooms, and service-room immediately adjoining. At the north end of the building are the kitchen, scullery, pantries, servants' hall, and other domestic arrangements for the cooking departments and servants. On the ground floor there are two sitting-rooms, one 30 ft. by 24 ft., and the other 30 ft. by 28 ft. Arrangements have been made whereby the partition between the two rooms can be readily removed. Thus a room 52 ft. by 30 ft. can be formed for lectures or other purposes. On this floor there are also lavatories, matron's room, and eighteen

cubicles, or bedrooms. On the first and second floors there are fifty-six bedrooms, with the necessary linen closets and store-rooms. There are bath-rooms on each floor. The lavatory arrangements are confined to a sanitary tower on the south side of the building, which is practically isolated from the main building by a ventilated corridor. The general arrangement of each floor is a central corridor 6 ft. wide, with the various cubicles or bedrooms and other apartments leading off right and left. At each end of the building is a stone staircase communicating with the various floors, and approached from the hospital side by external entrance. The new home has communication on the ground and first floors with the existing nurses' home by means of a glass-covered corridor. The walls of the bath-rooms, lavatories, and domestic offices are lined with white glazed bricks. The building throughout will be heated with hot water, the heating chamber being in the lower part of the sanitary tower. The whole of the premises are lighted by electricity.

CLUB ROOMS, OSWESTRY.—Additions have been made to the Oswestry Conservative Club buildings. The alterations include a new billiard-room, bar, lavatories, and alterations to the hall and card-room. The general contract was let to Mr. William Felton, Oswestry, and the seating and decorating works were carried out by Messrs. J. Jones & Son, Oswestry. The work has been carried out upon the designs and under the superintendence of Messrs. Shaylor & Madoc-Jones, architects, Oswestry. Mr. E. M. Gardner fitted the heating apparatus.—*Oswestry Advertiser*.

PROPOSED THEATRE, BALHAM.—A site has been secured in the Balham-road, with a frontage of 80 ft. and a depth of 150 ft., upon which Mr. W. G. R. Sprague will shortly erect a theatre. The house is to be named the Royal Duchess Theatre.

BUSINESS PREMISES, DUBLIN.—New premises for Mr. Terence Kelly have just been opened at 48, Fleet-street. The establishment is lighted by electricity. The contractors were Messrs. Kiernan, the architect was Mr. Geo. L. O'Connor, and the shop-fittings were executed by Messrs. Sade, of London, and the safes by Mr. Geo. Price, Wolverhampton.

EMPIRE PALACE AND MUSIC HALL, NOTTINGHAM.—This building has just been opened in South Sherwood-street. The scheme of decoration is Oriental in character, and Indian methods in regard to art have been largely drawn upon. The two boxes which flank the stage are surmounted by pagoda-like gilded domes, and two idols guard each side of the proscenium. The ceiling and circle fronts are treated in blue and gold. Large models of elephants' heads stand out at each corner, supporting the ceiling. Exactly in the centre is fixed a glass sliding roof. This can be removed and replaced in half a minute. The heating apparatus is constructed upon the most recent methods. There are upwards of 100 electric lights in the auditorium, most of which are in the form of "shower" electrolusters. The entrances are all situated in South Sherwood-street. Stone steps lead to a lounge, which extends from one side of the circle to the other, and each end is placed a cloakroom, that destined for the use of ladies being to the right hand. At the back of the grand circle six boxes have been placed. The fauteuils are reached from the circle. Balustrades surround the circle, which contains six rows of seats. There are three rows of the fauteuils, and several rows of stalls. Behind the balcony is situated the gallery. There are two refreshment saloons, one for the use of the patrons of the fauteuils, stalls, boxes, and circle, and the other for the gallery and balcony occupants. A screen of frosted glass, erected on the balcony side, provides for the partial seclusion of the balcony audience. The stage is 35 ft. wide, with a 30 ft. proscenium opening. A complete instalment of gas has been laid on in the event of any mishap with the electrical plant. The dressing-rooms are ten in number. Mr. J. Greenman was resident clerk of the works for Mr. F. Matcham, the architect.

MANSION, ALLOA, N.B.—The mansion of Mr. A. P. Forrester Paton, which has been in course of construction for some time past on the rising ground to the west of the town is now completed. The building is in the English Renaissance style, and has a square tower rising to a height of 55 ft. There are within the grounds conservatories, gardener's house, coachman's house, coach-houses, &c., also an ornamental lake. The architects were Messrs. Sydney Mitchell & Wilson, Edinburgh, and the various works have been carried out by Mr. Gordon, clerk of works. The contractors were—Builder, Mr. Philip, Tillicoultry; joiners, Messrs. H. T. & R. Montgomery, Edinburgh; and for oak work, Messrs. Anderson & Sons, Glasgow; plasterer work, Mr. J. Walker, Alva; plumber work, Mr. J. Philip, Alloa; staker work, Mr. McFarlane, Alloa; painting work, Messrs. Moxon & Co., Edinburgh; electricians, Messrs. Mayer & Coulson, Limited, Glasgow; contractors for conservatories, Messrs. Mackenzie & Moncur, Edinburgh.

LIBERAL CLUB, BIRKENHEAD.—On the 5th inst. the foundation stone of a new Liberal Club was laid at Birkenhead. The club, which is situated in Cloughton-road, will contain reading-rooms, recreation-room, committee-rooms, a billiard-room with three tables, and a meeting hall to hold about 400 persons. Mr. Thomas Cook is the architect, and Mr. P. Rothwell the contractor for the building.

CLUB HOUSE, LYTHAM, LANCASHIRE.—The new club house of the Lytham and St. Anne's Golf Club was opened on the 5th inst. The building has been erected from the design of Messrs. Woolfall & Eccles, of Liverpool, and has cost approximately £8,000. The house comprises entrance hall, locker-rooms, club-rooms, dining hall, ladies' club-room and dressing-rooms, billiard-room, baths, lavatories, offices, and steward's service.

CO-OPERATIVE STORES, WATFORD.—New stores have been erected in St. Albans-road by the St. Andrew's Co-operative Society. The buildings, which cover a frontage to the St. Albans-road of about 51 ft. and a depth of about 110 ft. to Hatfield-street, comprise a basement about 50 ft. by 30 ft., with furnace-house, &c. On the ground floor are two shops, scullery, main entrance, with side entrance in Hatfield-street. The first floor comprises hall, about 40 ft. by 30 ft., approached from the ground floor by main staircase and landing and staircase from side entrance. There are also a secretary's office and committee-room on the first floor. The work has been carried out by Mr. Charles Eames, of Watford, under the superintendence of Mr. C. P. Ayres, J.P., architect.

VOLUNTEER MEDICAL STAFF CORPS, LEEDS.—The new headquarters of the Volunteer Medical Staff Corps just opened consist of a drill hall, staff offices, orderly offices, clothing stores, and residence for staff sergeant, with the rear portion of the site reserved for the erection of a model hospital in the near future. The work in connexion with this corps has been carried on by Surgeon-Captain de Burgh Birch from its formation. The new buildings have been erected from plans prepared by Mr. William Bakewell.

NEW UNDERGROUND CONVENIENCES AND LAVATORIES, SHOREDITCH.—These conveniences, at High-street, opposite Shoreditch Church and New North-road, by East-road, have been constructed for the Vestry at a total cost of £4,000, by Mr. George Lambeth, sanitary engineer, of Lambeth, under the direction of the Works Committee and the Surveyor. That in Shoreditch High-street is triangular in form, being 40 ft. long by 40 ft. extreme width, the floor level being about 10 ft. below the carriage-way. The internal fittings are of the latest type, the urinals being built "Radial" stalls, and the water closets of Jennings' special Midland pattern. Three lamp columns serve as ventilators to the drains. The convenience will be lighted by electricity, a gas supply being also supplied for emergency. The cost has been 2,450. That in the New North-road is 31 ft. long by 24 ft. wide at one end, and 0 ft. wide at the other end. There are two lamp columns serving as ventilators. These are two lamp columns serving as ventilators. There are two lamp columns serving as ventilators. There are two lamp columns serving as ventilators. The cost was 1,650. Both conveniences are ventilated by "Blackman's Air Propellers," the fans being driven by water power, the air discharging into the shafts of the lamp columns. The waste water from the ventilators is taken off about 10 ft. for flushing the urinals, &c. The floors are paved with black and white tiles. The divisions between waterclosets, &c., are of marble, and the whole of the woodwork used is teak. The roofs are constructed of glazed bricks, with rectangular lenses, fixed upon granite kerbing, which is carried by steel girders. The drainage has been carried out in the perfect manner and subjected to severe tests. All the pipes are bedded in and covered with concrete, each main chamber being intercepted from the main sewer and the whole system amply ventilated. Every section of the drains can be separately examined, tested, and cleansed by means of inspection eyes at various points. Access can be obtained with white glazed valves are provided at all intersections, these being covered with double-sealed and tiled covers at the floor level. The work has been carried out for the contractor by Mr. G. B. Davis.

SANITARY AND ENGINEERING NEWS.

SEWERAGE OF LEIGH-ON-SEA.—Mr. E. Bailey Denton (Bailey Denton, Son, & Lawford) has been instructed by the Urban District Council of Leigh-on-Sea to report to them as to the best means to be adopted for the sewerage and sewage disposal of their district. Since the provision of a public water supply and the development of several water estates within the parish, the population has greatly increased, and a proper system of sewerage has become a matter of necessity. Leigh is the last town on the Essex side of the River Thames within the jurisdiction of the Conservancy Board, and is immediately above Southend, where the Council on the advice of Mr. James Mansergh, have recently spent a large sum of money upon sewerage. The method of sewage disposal, therefore, which will ultimately be adopted at Leigh is a matter of great interest to other towns situated within the tidal reaches of the Thames.

SEWAGE WORKS, WEST BROMWICH.—On the 3rd inst. Colonel W. R. Slacks held a Local Government Board inquiry at the Town Hall, West Bromwich, concerning the application of the Town Council for sanction to apply 3,500l. of the balance of loan raised by them for works of sewerage and sewage disposal in defraying the cost of certain works of sewage disposal. Mr. Caddick, Town Clerk, explained that the amount expended in the

work was 113,422l., leaving a balance in hand of 9,467l. From that had to be deducted 5,500l. for work not yet carried out, leaving a balance of 4,167l. The biological system, that if they had to resort to the chemical treatment they would be available for that purpose. It was proposed to put down two filter beds on the low level system, at an estimated cost of 1,000l., and one on the high level at a cost of 500l. It was also proposed to spend 2,000l. for the underdraining of cessars, as the areas of the sewage disposal system, the total expenditure of the work which carried out in its entirety would be about 14,000l. Mr. A. D. Greatex, Borough Surveyor, said he was formerly surveyor and engineer to the Sutton and Surrey District Council, where the biological system had been successfully carried out.

WATER SUPPLY, FINCHAM.—At a recent meeting of the Fincham Urban Council, Mr. Donald reported that the General Purposes Committee had had the question of providing the town with a proper water supply before them at a special meeting, and their recommendation to the Council was that the scheme put forward by Messrs. Mosley & Anderson, of Northampton, should be adopted, and that it be proposed to Messrs. Mosley & Anderson, the estimate of their scheme was 6,500l. He proposed that the Council accept that scheme. The Council adopted the General Purposes Committee's recommendation.

SANITATION AT NICE.—We are informed that since the controversy two or three months ago, the condition of the environs of the Queen's Hotel, Palace Hotel at Nice, where the Queen usually resides when visiting Nice, new sanitary works have been carried out, under the direction of Mr. Hugh Smith, C.E., of Nice, throughout the house and grounds, on the same lines as at the Grand Hotel Cimiez, where the Queen stayed the two previous years.

PIER, PORT VICTORIA.—The South-Eastern Railway Company have completed the reconstruction of Port Victoria pier, the terminus of the Hundred of Hoo branch, which was temporarily closed for traffic in October, 1896, on account of the structure being considered unsafe to bear the strain of trains. The pier has been strengthened by the addition of 172 piles, the largest of them being 70 ft. long and 17 in. square. The piles on the river side of the pier have been left standing 6 ft. above the deck level, in order to prevent the sponsors of Royal yachts from settling on the edge of the pier when lying alongside at high water. The whole of the old piles have been left in place, the new piles being driven alongside of them and being bolted to them by 1½ in. bolts. To prevent the inroads of the "teredos," popularly known as shipworms, which have eaten away the old piles in such a remarkable manner, the new piles have been sheathed with copper for a height of 4 ft. above mud level. The plan of the superstructure—platform and buildings—has been entirely altered, the rails being now laid on the inner side of the pier, facing the Isle of Grain. A covered way has been provided for the convenience of Royalty arriving or disembarking, and the length of the platform has been extended to 500 ft. The works have been carried out by Messrs. Piers, Aird & Sons, of Lambeth. The South-Eastern Railway Company's service with the Isle of Sheppey cannot be resumed until the rebuilding of Sheerness pier, which was partially destroyed in the gale of November 29 last.—*Times*.

STAINED GLASS AND DECORATION.

WINDOWS, ST. MARK'S CHURCH, LOWMOOR.—Three stained glass windows have just been placed in St. Mark's Church, Lowmoor. The subject represented are the Holy Family, Ruth, and Dorcas. The work is from the studio of Messrs. Abbott & Co., of Lancaster.

DECORATION OF CONGREGATIONAL CHURCH, FREEMANTLE, HANTS.—This church, situate at the corner of Albert-road, and facing Shirley-road, after having been closed for several weeks to admit of the decoration of the interior of the structure and the erection of a new pulpit, has been re-opened. The decorative work has been carried out under the direction and supervision of Messrs. Mitchell, Son & Gutteridge, architects, of Southampton.

FOREIGN.

FRANCE.—Mme. Lemaire, well known at the Champ de Mars salons as a flower and fruit painter, has been appointed Professor, at the Natural History Museum, of design based on the study of plants.—The Municipal Administration of Paris intend shortly to light the Bois de Boulogne with electricity, commencing with the Allée of the Port Dauphine, the circumference of the Pont de Suresne will be subsequently taken in hand, and next the Jardin d'Acclimatation and the Allée de la Reine Marguerite.—The Government has under consideration a scheme for arranging the Pavillon de Flore as a palace for the reception of royal personages who may visit the 1900 exhibitions, has named the Institute in charge of Chantilly, has named the Institute that the galleries of the museum and library at Chantilly can be opened to the public.

On April 5.—On April 26, the centenary of the birth of Delacroix, the monument erected to memory by the Conseil Général, at St. Maurice, will be inaugurated. The architectural part of the monument is the work of M. Lequeux.—The municipal council of Toulon has rejected the scheme of the sanitation of the town, which had been under consideration for six years past.—M. Paul Faiver, architect, of Versailles, has been elected President of the Société des Architectes de Seine-et-Oise for the present year, and M. Naquin de Lippens has been elected President of the Union Architecturale de l'Yonne.—The jury of the competition opened for the erection of schools at Agen has awarded the first premium to M. Bourgeois, architect, of Poissy, and the second to M. Caslon, "constructeur," of Agen.—The death is announced, at the age of sixty-eight, of M. Ernest Baril, formerly architect to the Compagnie Générale des Omnibus à Paris. M. Baril had been joint architect with M. Brunet-Desbains in various works in the town of Havre, especially the Hôtel de Ville and the Sous-préfecture. Some iron constructions of considerable importance which he had carried out led to his being elected, in 1879, a member of the Société des Ingénieurs Civils. He also became a member, in 1876, of the Société Centrale des Architectes.

GERMANY.—Some time back we referred to the considerable improvements proposed at Munich, near the old Hofgarten. The design was by an architect, Herr Otto Lasser, who understood that the scheme is to be carried out as soon as possible.

The result of the annual Schinkel competition under the auspices of the Architektenverein has been announced, and Herr S. Mueller, of Berlin, takes the first premium on the civil engineering side. There are thirteen competitors.—We understand that the Government of Saxony will erect an electric light station as well as a heating station to supply the various Government and Court buildings which are near the Zwinger. The former station is estimated to cost 35,000l., and the latter 50,000l., but a considerable economy is expected, as each of the buildings has its own machinery at the present time.

A NEW HARBOUR FOR CHRISTIANA.—An important international competition has been opened for the Christiania for some new harbour works and embankments. The conditions for the competition seem to have been well thought out. The premiums are 10,000, 5,000, and 3,000 crowns respectively, and there will be a board of nine assessors, of whom six are laymen and three members of the technical professions. Of the latter, one is a German (Herr Franzicus, of Bremen), one a Dane (Herr Moeller, of Copenhagen), and one a Norwegian, i.e. the City Engineer of Drøhneim. The new harbour works will extend from the old King's Harbour to the Bay of Frognerskilen.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Herbert Iberson, architect, has removed from 5, Adelaide-place, London Bridge, to 28, Martin's-lane, Cannon-street, E.C.—Mr. B. Nowell, of the former firm of Nowell & Robson, stove merchants, &c., Warwick-road, Kensington, has taken into partnership his sons, Mr. Harry Nowell and Mr. Frederick Nowell, and the business will be carried on under the firm of B. Nowell & Co.—Messrs. T. R. B. & Co., Patent Tile Works, Burslem, have removed their London office from Valtham Buildings to Birkbeck Bank Chambers, Southampton-buildings, Holborn, E.C.—The partnership between A. H. Batley and W. W. Linfoot, as builders, of 42, Birdhurst-road, Croydon, has been dissolved by mutual consent.

COATS' MEMORIAL STATUES, PAISLEY.—The statues of the late Mr. Thomas and Sir Peter Coats were unveiled at Paisley on the 26th ult. In his treatment of the statues, Mr. Rhind shows Sir Peter, who was very active in his habits, with his frock coat thrown back by the left hand, the right hand grasping the lapel below the collar, while Mr. Thomas is placed in a reposeful attitude, his frock coat buttoned, and over it his top coat. The pedestal of the Sir Peter statue is square. There are pilasters at the corners, and niches with panels on each of the four sides, and on these are placed symbolic figures representing "Frugality," "Industry," "The Arts," and "Literature." The pedestal of the Thomas Coats statue is of white marble, almost circular in form, and the panels, with symbolic figures in bas relief, represent "Prudence," "Perseverance," "Industry," and "Frugality."

ELECTRICIAN DIRECTORY.—The Electrician Trades' Directory for 1898 is a carefully compiled and thoroughly trustworthy book. A great deal of interesting and important matter for electricians is included in it which it is difficult to find elsewhere. We may mention specially a digest of the new laws of electric lighting, a description of the many lifting scale systems adopted in charging for the electric light, and diagrams of lamp connections as deserving of praise. Large sheet tables are included, giving full particulars of the electricity supply stations and the electric tramways in the United Kingdom. These tables are most useful for hanging up in central stations, electrical engineers and contractors' offices, &c., as they give at a glance all the information required for statistics and technical data. The only part of the book which dis-

points us is the biographical portion at the end. We miss notices of such eminent electricians as Lord Crawford, Steinmetz, and Glazebrook, but come across long accounts of various amiable and deserving electricians who can hardly be described as eminent. A strict editorial revision of this part of the book is necessary. This, however, is a small point, and, taken as a whole, the directory is a valuable guide and a most useful book of reference for all connected with the electrical trades or interested in the applications of electricity.

COLOURED FRIEZES FOR ROOMS.—Messrs. Wylie & Lochhead send us some chromo-lithographic reductions of wall-paper-friezes, designed for by Mr. Arthur Gwatkin and Mr. F. Hamilton-Jackson. They are well produced, and have a very good effect. The two best are the "Iris" frieze and the "Poppy" frieze, in which the lines are more free and the treatment broader than in the two chrysanthemum friezes, which contain rather too many thin lines, though meritorious in other respects.

MEMORIAL STATUE, MANCHESTER.—It is proposed to unveil the statue to the late Mr. Ben Brierley, in Queen's Park, Manchester, about the middle of next month. The statue will be 7 ft. 8 in. in height, and the pedestal and base 9 ft., a total of 16 ft. 8 in. A full-size clay model, which the committee have already seen and approved of, has been prepared by the sculptor, Mr. John Cassidy, of Manchester.

ELECTRIC LIGHTING, SUNDERLAND.—The Lighting Committee of the Sunderland Corporation have had presented to them a report with regard to the electric lighting of the town. In this the Electrical Engineer (Mr. Snell) states that the demand is increasing so rapidly that further extensions are necessary. He estimates that to meet the requirements up to 1901, 12,781l. would be required for buildings, boilers, and dynamos, tools, &c., and a further 12,500l. for mains and such like. The immediate requirements would be met by the sum of 7,800l. Mr. Snell suggests that application should be made to the Local Government Board for leave to borrow not less than 25,000l. With this sum it is thought that all the districts in the borough can be brought within the area served by the light.

NORTHAMPTON INSTITUTE.—The "Announcements" publication of this Institute shows a remarkable programme of technical and industrial education. In the preface, giving the outline of work, it is remarked that the modern constructive and artistic crafts employ in their processes so many methods derived from widely different sources, and use the principles developed in so many branches of natural science, that scarcely a single trade can be found which does not demand from an intelligent craftsman or journeyman, if he is to understand his daily work, a clear knowledge of fundamental principles drawn from more than one science. Fortunately, in many cases, the principles referred to are not very abstruse, and can be easily grasped by a man of ordinary intelligence who is willing to devote the necessary time to the study. For the guidance of such, a table has been compiled to enable the workmen engaged in the various trades specified to ascertain readily the Institute classes which they should attend, in addition to those more immediately dealing with their particular trades. The courses have been arranged specially for the benefit of the artisans, apprentices, and others engaged in the Clerkenwell trades. It has been assumed that an earnest student will be willing to devote three or, in some cases, four nights a week to study during the winter months, and the table will show him how to make the best use of his time.

GREYFRIARS CHURCH, ABERDEEN.—A suggestion put forward as a solution of the present difficulty with regard to the completion of the Marshall College Extension Scheme, Aberdeen, is that Greyfriars Church should be retained on its present site and restored—not as a building for academic purposes, but as a church. The building would front Broad-street. According to a design by Mr. Marshall Mackenzie, A.R.S.A., a new aisle would be constructed along the east side of the church in order to bring the building into closer resemblance to the church as it existed originally. According to the *Aberdeen Free Press* the adoption of this scheme would obviate the necessity of erecting the proposed new church and would also leave in the hands of the authorities a very valuable asset in the shape of the site of the proposed building. It has been urged that there might be a difficulty in carrying out this scheme owing to the obligation undertaken by the Corporation to build the new church. This, however, is not so. It would be perfectly competent, it is contended, for the minister of Greyfriars, the kirk session, and the Presbytery to discharge that obligation, and so allow the present building to be retained and devoted to its present and historic use as an ecclesiastical building.—At a meeting of the Finance Committee of Aberdeen Town Council on the 3rd inst., Lord Provost Mearns read extracts from letters received on behalf of the person who has offered, on certain conditions, to give 10,000l. to the University Extension Scheme. One of the conditions is that the old Greyfriars Church must be retained, and the Committee decided some time ago to endeavour to get this stipulation modified, but the correspondence submitted was to the effect that the person who made the offer was determined that the retention of the church shall be an absolute condition of the gift being given. The committee did not take up consideration of the matter, as they

are to meet subsequently the University Court to discuss the whole subject.

ANCIENT MONUMENTAL BRASSES.—In the Chemical Theatre of the Technical School, Blackburn, recently, Mr. T. Harrison Myers, of Preston, lectured on "The Monumental Brasses of the District," the word "district" covering the two counties of Lancashire and Cheshire. The lecturer pointed out that ancient monumental brasses are not without their counters in modern art. The coffin plate and the door plate are their lineal descendants. At the present time there are only 4,000 brasses in churches in England, and these are mostly in the South country. No fewer than 8,000 brasses have been stolen or destroyed, and lost for ever. The counties of Lancashire and Cheshire have not many brasses, and those that they have are mostly poor in character. Such had been the shameful destruction of these beautiful memorials of the dead in the churches in the preceding reign, that Queen Elizabeth issued an edict against the vandalism that prevailed. But the greatest destruction took place a hundred years after this, in the time of the Revolution. Brasses were not made in England until the time of Queen Elizabeth. In all there were twenty-five ancient brasses in churches in Lancashire, and twenty in Cheshire. The brasses in Winwick Church were very fine. In Whalley Church there was a brass in memory of Sir Ralph Catterall and his wife. The design was similar to that of Henry Norris and his wife at Winwick, the costumes being almost identically the same. The migrations undergone by some brasses were very remarkable, as, for instance, one that formerly belonged to Preston Parish Church, and had been discovered in the Isle of Man. He had discovered no fewer than seventeen valuable brasses hidden away on a shelf under a staircase in Lancaster Parish Church. The brasses of the Assheton family in Middleton Church were very excellent, and well worth a careful inspection. The lecturer concluded his remarks by an account of the difficulty he had experienced in procuring a rubbing of the brass of the founder of Manchester Cathedral, which he found hidden away in the crypt, and by stating that the object of his lecture was to secure the preservation of such of these interesting monuments in their churches as were still left to them. The lecture was illustrated by a large number of rubbings and diagrams.—*Blackburn Standard*.

RESISTANCE OF MATERIALS TO FIRE.—A Committee of the "Kent and Essex Brickmasters' Association" have been making an examination of the effect of the fire on the various materials in the houses destroyed in the Cripplegate fire, and have issued a short report on the subject. The following is their statement as to the condition of the various materials examined:

1. Ordinary stock building bricks, quite un injured.
2. Perforated bricks, broken to pieces, and where they were used for outside facing the front face was gone, and the perforations exposed.
3. Blue bricks, faces gone.
4. Red bricks, faces gone and destroyed.
5. Stone, cracked and destroyed.
6. Iron girders, mostly twisted and curled up.
7. Wooden beams, charred, but practically otherwise un injured.
8. Match-boarding used for panelling the walls, burnt to tinder.

They add that they think the conclusion to be drawn from the action of this fire upon the brickwork is that the stock bricks, although not even of the best quality, were quite unaffected, and they attribute this to the fact that stocks, from the large amount of silica in the brickearth from which they are made and from the mode of manufacture, are of the nature of a fire-brick. Bricks made purely of clay, and especially when made by machinery, were not so able to resist the action of fire. The report is signed by Messrs. A. Rutter, G. H. Dean, G. E. Wragge, H. Packham, and E. W. Good-enough.

INTERNATIONAL EXHIBITION, MADRID.—We are asked by the Spanish Chamber of Commerce to call attention to this exhibition, which will be held at Madrid from April 10 to July 10, and which is organised in connection with the International Congress of Hygiene and Demography. The exhibition will include among its subjects "Urban Hygiene," "Hygiene in Relation to Dwelling Houses," "Demography and Statistics," &c. Exhibitors will enjoy the following privileges:—No charge for spaces occupied at the exhibition; the goods will be imported into Spain free of Customs duties; the railways of Spain will make a reduction of 50 per cent. from their tariff for carriage. Travellers attending the Congress will enjoy the following advantages: The Spanish railway will reduce the price of the tickets by 50 per cent.; the Compania Transatlantica Espanola (Steamship Company) also make 50 per cent. reduction on their return tickets to Spain, and travellers are entitled to attend the excursions, receptions, and amusements prepared or which will be given in connection with the said Congress, among which will be one at the Royal Palace of Madrid, and one at the Palace of the Municipality.

BUILDING TRADES EXCHANGE, NEWCASTLE.—On the 4th inst., at the Douglas Hotel, Newcastle, a meeting was held to consider the proposal for establishing a Building Trades Exchange for Newcastle, Gateshead, and district. Mr. J. G. Walker presided, and amongst those present were Colonel Bennett

(President of the Glasgow Exchange), Mr. David Cook (secretary, Glasgow Exchange), and others. The Chairman briefly indicated how the proposal came about. A meeting was called, and as a result a deputation visited Glasgow. At another meeting the deputation presented a report, in which they said they were satisfied that the exchanges at Glasgow and Edinburgh were a distinct success, that they would strengthen and concentrate the various trades and professions connected with building, and encourage and promote and protect the interests of the trades in many ways.—Colonel Bennett then read a paper sketching the character of the building exchanges he had visited in America. He said he had come to the conclusion that these might be advantageously introduced into this country. At Glasgow they had proved the possibility of their existence. The American builders, believing that more intimate social relations and acquaintance with each other would tend to check the bitterness of rivalry and keep the eagerness of competition within reasonable limits; and that in this way the skill and knowledge of each member would in a great measure be acquired by all, and their usefulness to the community in which they lived increased, formed themselves into associations which had gradually grown into the building exchanges. These institutions would be found to exist in every large city. Their objects were the encouragement and promotion of the building interests; the inculcation of just and equitable prices; the establishment and maintenance of uniformity in commercial usages; the acquirement, preservation, and dissemination of valuable business information; the adjustment as far as practicable of controversies and misunderstandings which were apt to arise between individuals engaged in a trade when they did not acknowledge rules to guide them; and by the membership to give assurance to the public of skill, honourable reputation, and probity. Taking the Philadelphia institution as a model, Colonel Bennett described how those engaged in the trades had specified hours for meeting each day at the exchange; how in this way much valuable time could be saved; and went on to detail the equipment of the exchange with its telephone and telegraph service, the new-rooms, lockers for members, &c. After pointing out how the material interests of business could be benefited by the exchanges, he urged that they should take their rightful place in the professions and callings of the country. They would not then have co-operative stores and municipalities running into gigantic building speculations to teach them the business of their lives, which they (the co-operators and municipalities) felt quite competent to deal with after having had a few months or so in a City Council. Dealing with the uniformity of contract question, he said that whilst the Americans did not claim to have devised a perfect contract, they did say they had made a great advance on anything there was in this country by at least fifty years. He predicted that the exchanges would have the effect of bringing the competent men to the front and sending the laggards to the wall. The exchanges would soon put an end to all shoddy work and shoddy work prices. Besides this, the public would have more confidence in the tradesmen they employed, and a better feeling would be established between architects, surveyors, and tradesmen. Speaking of the Glasgow Exchange, he pointed out that at the end of its second year it was perfectly solvent. It had gained the favour of many architects and surveyors; their sample rooms were already well filled; clients as well as buyers and sellers took advantage of their rooms; and all their trade meetings were held there, and it was known as a centre.—Mr. Cook gave details of the initiation and management of the Glasgow Exchange, and said it was recognised as an important factor in building matters. In cases of irregularity or grievances, where an individual protest was unsuccessful, action by the Exchange was generally effectual.—Mr. John Ferguson, who thought that the scheme was well worth a trial, moved that a Building Trades Exchange for Newcastle, Gateshead, and district should be formed. This was seconded by Mr. W. L. Newcombe, and carried unanimously. A committee was afterwards elected.

WOOD PAVING AT NEWPORT.—Mr. R. H. Bicknell, one of the Local Government Board inspectors, held an inquiry on the 4th inst., at the Town Hall, Newport, as to an application by the Corporation of Newport for sanction to borrow 5,000l. for the paving with wood blocks of the remainder of High street (the eastern end) and of Commercial-street. The Town Clerk (Mr. Newman) and the Borough Surveyor (Mr. Haynes) were present.

BUILDING TRADES EXHIBITION, MANCHESTER.—The opening of this exhibition, which had been fixed for April 18, is postponed to June 20, in consequence of the request of several exhibitors for more time.

CAPITAL AND LABOUR.

BUILDING TRADE, BRISTOL.—Various branches of the building trades in Bristol have issued notices asking for an advance of wages and a reduction of hours, to come into operation on the first of July next.

WAGES IN THE BIRMINGHAM BUILDING TRADE.—In accordance with the agreements existing between

the various sections of the building trade and the Master Builders' Association to the effect that six months' notice shall be given on either side for the alteration of rules, the scale of pay, &c., the representatives of the carpenters, plasterers, masons, plumbers, scaffolders, and labourers gave notice in October last of their intention to claim an increase of wages dating from April 1 next. In the case of each of the skilled branches the increase asked for is at the rate of one penny per hour, whilst the labourers and scaffolders ask for one halfpenny per hour. Notices were also given by the men of certain alterations desired by them in the rules. Since October several meetings have been held to discuss the situation on both sides, and, owing to the abnormal briskness of the building trade, the operatives have been encouraged to enforce their demands in their fulness. In view of the fact that the granting of the increases asked for would mean an enormous difference in the profits on existing contracts, the employers considered that the offer of an advance of one halfpenny per hour, to come into operation in April, 1899, would be fair; whilst, on the other hand, the operatives have decided that if the halfpenny is granted for the current year they would accept such a settlement as satisfactory now. The latter proposition has not yet been discussed by the masters, and, until they have dealt with it, it cannot be forecasted whether or not the negotiations will be maintained between employers and employed.—*Birmingham Post.*

DISPUTE IN THE BUILDING TRADE AT LINCOLN.—Some time ago—on February 1—the Lincoln joiners, bricklayers, and plasterers demanded an extra 1d. per hour (the prevailing rates for joiners and bricklayers being 7½d., and plasterers 8d.) for an alteration of the rules. The masters, in reply, offered an advance of ½d. per hour without mention of the rules as to apprentices, and to this offer, it is stated, no reply has been received, though the general belief is that it will be accepted.

LEGAL.

ALLEGED OBSTRUCTION OF ANCIENT LIGHTS AT SOUTH TOTTENHAM.

THE case of A. J. Moore v. Thorpe and Payne, and T. D. Moore v. the same, came before Mr. Justice Romer, in the Chancery Division, on the 3rd inst. Mr. Ashton Cross, on behalf of the plaintiffs, said they were actions brought by two brothers by reason of a building being erected which interfered with the light and air of certain houses belonging to them. For all practical purposes both cases might be treated as one. The plaintiffs were the owners of long leasehold houses situate in Richmond-road, St. Anne's-road, South Tottenham. The first four houses in Richmond-road were the houses belonging to his clients, and formed the subject of the action. The lease of those houses was granted in September, 1875, the houses being completed at the beginning of 1876, and were assigned to the father of both the plaintiffs. The father died in 1880, and left his sons the houses, two to each of them. What the plaintiffs complained of was the erection of a wall by the defendants which obstructed the light at the back of the plaintiffs' premises. Mr. Payne was the freeholder, who granted a license to Thorpe on Aug. 14, 1896, to erect the building complained of, and Mr. (Mr. Cross) should submit that the licensor and licensee were both liable. Complaints had been made by the plaintiffs about the interference with their light, but no notice was taken of their complaints for some time.

In giving judgment his Lordship said he thought there had been a substantial interference with the light to the windows of the wash-houses of Nos. 3 and 5, Richmond-road, but it was not, to his mind, a case for a mandatory injunction. He thought damages would be perfectly adequate. He assessed the damage to No. 3 at 30l., and to No. 5 at 20l. The defendants would have to pay the costs of the action, except so far as the costs were increased by the claims in respect to the houses Nos. 1 and 7, in respect of which, to his lordship's mind, no substantial damage was established. Judgment accordingly.

MEETINGS.

FRIDAY, MARCH 11.

Architectural Association.—Mr. Hippolyte J. Blanc on "Scottish Ecclesiastical Architecture in the Fourteenth and Fifteenth Centuries." Illustrated by lantern views. 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. H. C. Adams on "The Drainage of Cottage Property." 8 p.m.

SATURDAY, MARCH 12.

Architectural Association.—Spring visit to the new Public Baths, New Cross-road. 3 p.m.

Institution of Junior Engineers.—Conversation, at Westminster Palace Hotel.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Friern Barnet Sewage Works. 3 p.m.

Edinburgh Architectural Association.—Visit (1) to the Leith Academy, Leith Links; (2) Old Leith.

Perth Architectural Association.—Visit to the New Post-office. 2.30 p.m.

MONDAY, MARCH 14.

Carpenters' Hall, London Wall (Free Lectures on

Matters Connected with Building).—Professor Banister

Fletcher on "Architecture versus Building." With lantern illustrations, &c. 8 p.m.

Society of Arts (Cantor Lectures).—Professor W. N. Hawley on "The Thermo-Chemistry of the Bessemer Process." 1. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Lecture by Dr. A. Hill. 8 p.m.

British Society of Architectural Photography.—Mr. G. C. Lawrence on "Architectural Photography." 8 p.m.

TUESDAY, MARCH 15.

Institution of Civil Engineers.—Mr. Henry Fowler on "Calcium Carbide and Acetylene." 8 p.m.

WEDNESDAY, MARCH 16.

Society of Arts.—Mr. Clayton Beadle on "The Recent History of Papermaking." 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the B.C.C. Common Lodging House, Parker-street, Drury-lane. 3 p.m.

Builders' Foremen and Clerks of Works Institution.—Ordinary meeting of the members. 8 p.m.

Edinburgh Architectural Society.—Mr. T. Kershaw Bonnar on "Ecclesiastical Decoration." 8 p.m.

British Archaeological Association.—Mr. Allen S. Walker on "The Screen of All Hallows the Great." 8 p.m.

THURSDAY, MARCH 17.

Royal Institution.—Professor J. A. Fleming on "Recent Researches in Magnetism and Dia-magnetism." III. 3 p.m.

Society of Antiquaries.—8.30 p.m.

Institution of Civil Engineers (Special Meeting).—The sixth "James Watt" Lecture, by Prof. W. W. Dawkins on "Geology in relation to Engineering." 8 p.m.—Students' visit to the ventilating, heating, lighting, and drainage arrangements of the Houses of Parliament. 11 a.m.

Sanitary Institute (Lectures for Sanitary Officers).—Lecture by Dr. H. R. Kenwood. 8 p.m.

FRIDAY, MARCH 18.

Royal Institution.—Mr. James Mansergh on "The Bringing of Water to Birmingham from the Welsh Mountains." 9 p.m.

SATURDAY, MARCH 19.

Institution of Junior Engineers.—Visit to Messrs. J. & E. Hall's Refrigerating Machinery Works, Dartford. 3.30 p.m.

Sanitary Institute (Demonstration for Sanitary Officers).—Inspection at Harrison & Barber's Knacker Yard, Winthrop-street, Whitechapel. 3 p.m.

Perth Architectural Association.—Visit to Edinburgh.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to objection until April 16.

1898.] 4,001.—**USE OF BRICKS.**—Use in Construction. J. C. Grandrath & Co.—The bricks or blocks, composed of artificial stone, beton, tuff, or other suitable concrete, and of a height of two or more courses, are fashioned with perforations, projections, grooves, or feathers, for engagement with one another and the adjoining masonry, in the construction of flues, chimneys, and other shafts.

4,002.—**BALL CASTORS.** A. F. Haukeley.—The castors has a number of loops, or brackets, cast inside the socket or cup, enclosing the ball, against which the annular axles rest, and by which the axles and anti-friction rollers or discs are held in position.

5,617.—**APPARATUS FOR KEEPING DRY THE INTERIOR OF PLANOFORMS, ORGANS, AND OTHER ENCLOSURE CHAMBERS.** T. Tanner & Winter.—A receiver made of glass and divided into two chambers by a perforated drainage plate, whose edges are covered with a non-resonant material; hygroscopic salts are placed in the upper part of the receiver, and the liquid resulting from deliquescent trickles through the drainage plate into the lower part.

6,358.—**HAND-DRILLING TOOLS.** A. A. Tattersall.—The novelty lies in the combination with a special drill of a short auxiliary spindle adapted at one end to screw into a hole made in the drill spindle and provided at the other end with a centre and a removable breastplate; the centre, with its breast, lever, or screw, is used to feed, and also in combination with a crank brace and a ratchet.

6,512.—**VENTILATING THE ROOFS OF STABLES, COW HOUSES, &c.** H. Green.—This slabs or boards are attached to the rafters or timbers supporting the slating, and in the space between the slabs and the slating, forming an "underdrainage," is packed hay, sawdust, straw, or claff, for excluding cold air; bell-mouthed shaft tubes, provided with shutters or slides, allow the escape of air from within; fresh air is admitted by grids in the outer walls, communicating with tubes outside.

6,547.—**SUPPLY PIPE OR RISING MAIN.** Lustdrache Wasserkunstgesellschaft Kruse & Co.—The pipes or mains for use with apparatus for raising liquids by compressed air are curvilinear or corrugated in longitudinal section, so that the masses of liquid in the supply pipes may produce curves of fall, whereby the velocity of the fall of the mass is diminished, and larger areas of action are presented to the compressed air which effects the raising.

7,201.—**SOCKET JOINT OR COUPLING FOR RODS, &c.** J. Ephraim.—To prevent the set screw (of his former patent) from becoming detached from the joint, the invention recedes that part of the joint which receives the set screw and forms the recess with an undercut; then, having inserted the set screw, he expands its lateral wings under the undercut portions, which are high enough to allow space for the rising of the screw in order to release the joint.

8,493.—**COMBINED RULE AND SQUARE.** Hopton & Harwell.—The rule is made of sections of lengths, one section has a spring tongue for engagement with notches formed in the end and side of the other section, so that the rule can be converted into a square, or folded to half-length.

8,954.—**JOINTS FOR LEADS, PIPING, &c.** A. Clark.—The improved joining piece comprises a non-corrosive hollow metal lining, which has a non-conducting section around the middle portion thereof on the junction, and a metal shell on each side, and around the non-conducting section; the joint is particularly intended for tin-lined lead piping, wherein a section of non-conducting material is placed between the tin lining and the lead, or like soft metal outer pipe or casing; the joining-piece is made in T, or X, or other shape, with the outside lining of asbestos or other non-conductor.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Prizes.	Designs to be delivered.
County Office	Louthborough C.C.	30 Guinea First and 15 Guinea Second	Mar. 21
*Technical School	Trowbridge Corp.	50 Guinea	May 20
*Municipal Buildings	Ordaining T.C.	50 Guinea	No date
Church and Lecture Hall, Chorlton, Macclesfield	Committee of Fisherwick Place Presbyterian Church, Belfast	500, First and 250 Second	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. supplied by.	Tenders to be delivered.
Road Materials	Cheshire-le-Street R.D.C.	G.W. Aylton, Highways Surveyor, Cheshire-le-Street, R.D.C.	Mar. 14
*Erection of Superstructure of Asylum with Offices, &c.	County Borough of West Ham	St. Giles B. of W.	do.
*Making-up and Paving Roads	Wandsworth B. of W.	St. Giles B. of W.	Mar. 10
*New Sewers and Repairs to Existing Sewers, &c.	do.	do.	do.
*Asphalt and Wood Pavement	do.	do.	do.
Houses, Halifax-road, Brighouse	do.	do.	do.
Sewer, Dane-street, &c.	Shoeburyness U.D.C.	do.	do.
*Board Room and Offices	Edmonton Union	do.	do.
*Concrete River Wall	Hammersmith Vestry	do.	Mar. 16
Shelter, &c. at Workhouse, Jericho	Bury (Lancs) Union	do.	do.
Additions to Church, Danmole, co. Tyrone	York Union	do.	do.
Boundary Wall at Workhouse	Rhonda Valley	do.	do.
Additions to Hotel, Nantymoel	Isle of Wight R.D.C.	do.	do.
Widening Church-road, Gornard	do.	do.	do.
Lengthening King's Bridge, Freshwater	Chelmsford T.C.	do.	do.
Road materials	do.	do.	do.
Paving, Road Making, &c. Ellacombe road, Charlton, Kent.	Lee District B. of W.	do.	do.
Stones and Flint	Hollingsbourn (Kent) R.D.C.	do.	do.
Sewerage Works, Shooter's Hill	Fulmestead Vestry	do.	do.
Alterations to Deans Cottage, Warton Lane	do.	do.	do.
Sinking Stone Shaft, Lower Green Farm, Brighouse	do.	do.	do.
*Works and Materials	St. Giles B. of W.	do.	do.
Seven Houses, &c. Cross Roads	Leas & Cross Roads	do.	do.
School, Micknash	Newent (Glos.) Sch. Bd.	do.	do.
Conversion of Cellar into Police Parade Room, Pendleton Town Hall	Salford Corp.	do.	do.
Road Works, Primrose Hill	Brentwood Parish Council	do.	do.
Granite and Slag	Long Sutton U.D.C.	do.	do.
Groynes	Lowestoft T.C.	do.	do.
Sixteen Scullery Houses, Mauley-at-Brighouse	do.	do.	do.
Distillery, Sandhanger, nr. Forres, N.B.	Salford Corp.	do.	do.
Painting, &c. on Bridges over Irwell	do.	do.	do.
Bridge Works, Spittingfield-lane, &c.	do.	do.	do.
Adding to Residence, Otterbourne, near Ball Bosc, Yorks.	do.	do.	do.
Villas, Vernon-street, Bridlington Quay	do.	do.	do.
Village, Fleur de Lis, Pengam, Wales	Rev. Thomas Edwards	do.	do.
*Stoneware Pipe Sewers, Manholes, &c.	Hornsey U.D.C.	do.	do.
*Making-up and Widening Road	Edinburgh and District Water Trustees	do.	do.
Providing and Laying 3 miles C. I. Pipes, &c.	Mr. H. Smith	do.	do.
Alterations to Commercial Hotel, Kendal	Spencer & Co. Limited	do.	do.
Buildings at Sewage Disposal Works	Exith (Kent) U.D.C.	do.	do.
Baller House, &c. Bucknall	Stoke-on-Trent R.D.C.	do.	do.
Schools, near Disa	Raydon S.B.	do.	do.
Repairs to Cemetery Chapels, James Bridge	Darlington U.D.C.	do.	do.
Business Premises and House, Crumlin-road, &c. Belfast	S.M. Ater	do.	do.
Water Supply Works	Langport R.D.C.	do.	do.
*Cast Iron Water Mains and Accessories	Langport R.D.C.	do.	do.
*Extension of Electric Machinery	County Borough of Croxson	do.	do.
*Supply of Sulphate of Alumina	Watford U.D.C.	do.	do.
*Flats and Granite Curb and Cubes	Brighton Union	do.	do.
Assembly Rooms, Bridge-street, Swindon	do.	do.	do.
Houses, &c. Longwell-lane, Middlesbrough	do.	do.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. supplied by.	Tenders to be delivered.
Water Supply Works	Stromnessburgh Council	W. H. Copland, Engr. 146, West Regent-street, Glasgow	Mar. 20
*Road Materials	Leaham B. of W.	do.	do.
*Works and Materials	do.	do.	do.
*Baths and Discharge Rooms at Hospital	Hornsey U.D.C.	do.	do.
Organ Chamber, St. Mary's Church, Luddenden, near Halifax	Mailing Union	do.	do.
*Drainage of Workhouse Premises	do.	do.	do.
*Asphalt Paving Work and Repairs, Stone Paving	Hackney Vestry	do.	do.
*Cast Iron Water Pipes	Metropolitan Police District	do.	Mar. 21
*Repairs, Maintaining, Decorating Police Stations, Courts, &c.	Salford Corp.	do.	do.
Two Houses, Raw-lane, Hillingworth (York)	do.	do.	do.
Electric Light Station	Wood Green U.D.C.	do.	do.
Road Works, Ross and Cromarty	do.	do.	do.
*Masons' and Pavement Work, Granite, Ballast, Flints, &c.	Wood Green U.D.C.	do.	do.
*Police Station and Court Room	do.	do.	do.
Vagrant Wards	Bedwelly (Wales) Union	do.	do.
*Alterations at Infirmary and Construction of Underground Carriers, and General Steam Heating	Kingston Union	do.	do.
*Fire Brigade Station, North Waverley	Acton D.C.	do.	do.
*Road Materials	G.W.R. Co.	do.	do.
Station, &c. Rath, Cardiff	Poplar and Stepney	do.	do.
*Alterations at Asylum	St. James's Westminster Vestry	do.	do.
*Replating Basins at Public Conveniences	Kingston-on-Thames Vestry	do.	do.
Restoration of Parish Church, Andover	Hammermith Vestry	do.	do.
*Sewering, Paving, Lighting Roads	Warneford Hospital	do.	do.
*Extension of Electric Lighting Station	St. James's Westminster Vestry	do.	do.
*New Wing to Hospital	do.	do.	do.
*Cleaning, Painting, and Repairs at Road Buildings	do.	do.	do.
Villa, Albert Froude, St. Leonards	do.	do.	do.
*Laying and Supply of Granite Kerbs, Supply of Gravel and Hardcore	Romford U.D.C.	do.	do.
Infirmary Buildings at Workhouse	Windsor Union	do.	do.
*Motor Vehicles	Bournemouth Corp.	do.	do.
*Underground Conveniences	Paddington Vestry	do.	do.
*Extension of Electricity Works	Leyton U.D.C.	do.	do.
*Excavating and Foundation at Asylum	Keaton County Asylum	do.	do.
Sewers, Thelby Hall	Keaton County Asylum	do.	do.
Reconstruction of Pithburgh Bridge, near Ditchingham Station	Norfolk C.C.	do.	do.
*Bakery, Flour Store, and Shop	do.	do.	do.
*Construction of Extension of Railway with Bridges	do.	do.	do.
*Construction and Working of (Lattin) Pans Slaughter-house, two Markets and two Avenues	do.	do.	do.
*Infirmary Offices	do.	do.	do.
*Nine Shops, Public Hall Offices	Long Eaton Working Men's Co-op. Society	do.	do.
Four Cottages, Merdith-hill, Clacton-on-Sea	do.	do.	do.
Shop, &c. Church-street, Knapley	do.	do.	do.
Eight Houses, Victoria-street, Brierfield	do.	do.	do.
Thirty Houses, Fine and Shaw Streets	do.	do.	do.
Additions to Bay Horse Hotel, Wakefield rd., Bradford	do.	do.	do.
Ten Cottages, Driveway-lane, Bradford	do.	do.	do.
Painting, &c. Thirteen Houses, Railway-terrace, Kirkham, Lancs.	do.	do.	do.
Schools, Wadebridge, Cornwall	do.	do.	do.
Thirty-one Houses, Oley	do.	do.	do.
Houses and Shop, York-shire-street, Morecambe	do.	do.	do.
Rebuilding The Black Ball Inn, &c. starting	do.	do.	do.
Church, Day-on-Tyne	do.	do.	do.
Pottery Buildings, Burton-on-Lonsdale	do.	do.	do.
Water Supply Works, Loughmaddy	do.	do.	do.
Granite and Slag	do.	do.	do.
Offices, Stores, &c. Boston, Lincs.	do.	do.	do.
Road-making and Paving Works, Isaac's road, &c.	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Appointments to be made.
*Draughtsmen	Rocheville Corp.	.....	Mar.
*Clerk of Works	Godstone Union	.....	Mar.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. vi. Contracts, pp. iv, vi, vii, viii, & ix. Public Appointments, pp. xix & xxi.

Council

This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some faint smudges and discoloration, characteristic of old paper. On the right side, the binding edge is visible, showing a dark red or maroon material. The page is otherwise empty of text or illustrations.

No. 83. G

This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some minor creases and discoloration, characteristic of old paper. The left edge of the page is bound into the book's spine, showing the inner structure of the binding. The overall tone is warm and slightly yellowed, consistent with the age of the document.

ed,

This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some minor creases and discoloration, characteristic of old paper. The right edge of the page is bound into a dark red or maroon material, which appears to be the inner cover or spine of the book. The overall lighting is soft, highlighting the texture of the paper.

SPLISBY.—Accepted for the supply of 5,000 tons of broken granite, for the Rural District Council. Mr. F. J. Dixon, C.E., Splisby.

Granite.	Average price per ton.	Tons.
Matthew Jackson, Leath.	£11 3 for 3,567	
The Grey Granite Co., Leath.	11 2 " 2,186	
The Mountserrail Co., Mountserrail.	11 6 " 9,560	
Sigs.		
The Idaho Iron Co., near Tumpston.	8 1 for 1,593	
The Holwell Iron Co., Asfordby.	6 0 " 5,564	

SWANSEA.—For the construction of sewer, Bath-road, Morris-ton, for the Urban Sanitary Authority. Mr. R. H. Wyrill, engineer, Guildhall, Swansea.

Giff Davies.	£38 5 s	W. W. Lane, 1, Bay
Weaver Bros.	28 1 s	View-crescent
Charles Hanney.	26 7 s	£10 16 0
* Accepted.		

TAUNTON.—For the erection of a new dwelling-house and offices, near Taunton. Messrs. Sanson & Cottam, architects.

Cowlin & Son.	£5,437	H. J. Spiller
A. J. Spiller.	4,475	W. Stockham
W. Potter.	4,621	C. H. Pollock
* Accepted.		

THORNBURY (Glos.).—Accepted for the erection of school buildings for the Town Board, Mr. Samuel Fudge, architect, Thornbury, Glos.

Tucker Bros., Thornbury.	£4,603 7	
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WOODBRIDGE (Suffolk).—For additions to Grammar School, for the Governors of the Seckford Hospital and Woodbridge Endowed Schools. Mr. Fred. Chancellor, architect, Chelmsford.

Edward Adams.	£4,475	W. Stockham
George Barrett, Woodbridge.	379	
* Accepted subject to the sanction of the Charity Commissioners.		

YORK.—For alterations and additions to the Ebor Brewery, York, for Messrs. John J. Hunt, Limited. Messrs. Inskip & Mackenzie, architects, 5, Bedford-row, London, W.C. Quantities by Messrs. R. L. Curtis & Sons.

Ricombes & Son.	£4,650	Parker & Sharp
H. Arnold & Son.	4,650	Barry & Son, York
* Accepted.		

Rebuilding the "Freemason's Arms" public-house, Kensington.—In the list of tenders for this work published in our last issue, "Lowell & Lightfoot" should read "Lole & Lightfoot." The mistake was not ours.

LONDON SCHOOL BOARD TENDERS.

The following lists of tenders were submitted by the Works Department at the last meeting of the London School Board:—

CLOUDESTER-GROVE EAST. —Shifting partition in Girls department.		
S. T. Chichen.	£65 0	W. Hammond
W. Brown.	48 10	C. Luff
* Accepted.		

GRAFTON-ROAD. —Underpinning two external walls of south-east wing of main building.		
G. Kirby.	£175	M. Cormick & Sons
F. Britton.	112	Stevens Bros.
G. S. S. Williams & Son.	141	

LILLIE-ROAD. —Providing stepped flooring in six classrooms.		
Burder & Co.	£150 10	W. Hammond
W. R. & A. Hilde.	115 8	F. G. Minter
Lathey Bros.	98 15	

MIDDLE-ROW. —Removing two iron buildings, &c., from the "Midwell" site, and re-erecting them on this site.		
T. J. Hawkins & Co.	£280	T. Cray
Croghan & Co.	850	W. Harbrow
gunphey, Limited.	630	

NORTHEY-STREET. —Heating.		
W. G. Cannon & Sons.	£70 12	Berry, Campbell & Co.
Purcell & Noble.	60 0	J. Grundy
G. Davis.	60 10	J. F. Clarke & Sons

C.B.N. SNEWIN
MAHOGANY, WAINSCOT, WALNUT,
TEAK, VENEER, and TIMBER MERCHANT,
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,
HAITON GARDEN, and 29, RAY STREET,
FARINGTON ROAD, E.C.
THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY
THICKNESS, DRY, AND FIT FOR IMMEDIATE USE.
Telephone No. 274 Holborn. Tel. Address "SNEWIN, London."

ROSENDALE-ROAD.—New school—Boys and girls, 476. Infants (temporary), 276; total, 752; with schoolkeeper's house.

J. Carmichael	£16,098	Extra for building brickwork in cement.
W. M. Dabbs	16,976	238
W. Smith	16,098	205
F. & H. F. Higgs	16,488	200
Hollway Bros.	16,214	213
E. Lawrence & Sons.	16,633	213
C. E. Wallis & Sons	15,679	194
Stumpson & Co.	15,665	213
Treasure & Son*	15,395	194

ROTHERFIELD-STREET.—Executing structural alterations, repairs and painting, in order to adapt an old house on the site for a schoolkeeper's residence.

W. Silk & Son.	£750	Stimpson & Co.
W. Martin.	475	McCormick & Sons
F. Britton.	475	Stevens Bros.
* Accepted.		

ST. JOHN'S, HALLEY-STREET.—Replacing wood trimmers to three replaces with iron joists.

Johnson & Co.	£215	G. Barker
A. W. Derby.	65	E. Jackson & Son
J. Kybet.	65	J. D. Webb & Co.
* Accepted.		

WEST LAMBETH (Group 3).—Repairs on schedule on a painting contract.

E. Higgs.	+15 per cent.	on the schedule prices.
Parock Bros.	171	" "
Mawell Bros., Ltd.	110	" "
J. Garrett & Son.	71	" "
Rice & Son*	65	" "
Recommended for acceptance.		

TO CORRESPONDENTS.
W.D.—A.H.—E.M.L. (Below our limit). G.L.—A.S.—J.E.S.—J. & M. (Amounts should have been stated). W.L.R. (We cannot publish letters not authenticated by name and address). "Deputed Competitor" (We must decline to print your letter). W.G.R. S.—A.R.H. (Too late; next week).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return or to communicate.
Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline printing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

W. H. Lascelles & Co.,

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Some Renaissance Door Knockers.—From Drawings by Herr Arthur Lippitsch *Double-Page Ink-Photo.*
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Report on Metropolitan Poor-Law Schools



Two Reports recently made to the Local Government Board, on the condition of the Metropolitan Poor-Law Schools, are of considerable practical interest to architects who may have to deal with the erection or with the sanitary improvement of buildings in which a large number of persons, whether old or young, have to be permanently collected. One of these is the Report by Mr. W. Napier Shaw, Lecturer on Experimental Physics at Cambridge, on the ventilation and warming of the class of schools named above, the other is the Report by Dr. Sydney Stephenson "On the Ophthalmic State of Poor-Law Children in the Metropolis."* A good deal of this latter Report is naturally of a purely medical character, but it includes some valuable practical suggestions as to the precautions necessary in the arrangement of schools, especially in regard to ventilators, in order to minimise the risk of ophthalmic contagion.

The conditions of the Poor-Law Schools are different from those of general schools and public elementary schools, inasmuch as they are occupied for the whole twenty-four hours of every day throughout the year, both as residences and as educational institutions. There are no holidays when the children are separated, and the schools can be left empty to recover their sanitary condition. They are mostly also very large institutions, bringing together great numbers of children, and many of them were planned and laid out before the difficulties and dangers of such a large aggregation of inmates were realised. Hence some of them, like old-fashioned hospitals, are very deficient in regard to separation into blocks, and in fact one or two of them have undergone a drastic process of cutting up into smaller

blocks than were originally planned, portions of the large blocks having been removed so as to break up the buildings into several smaller blocks, in accordance with more recent experience as to the planning of such institutions.

As the difficulty of securing adequate ventilation and a continuously sanitary condition is especially felt in regard to this class of building, the statistics as to the methods of ventilation employed, and the results, are of considerable practical interest, especially as indications of the difficulties to be overcome.

Mr. Napier Shaw's Report deals with ten Poor-Law schools, considered in seven subdivisions, viz. : Dormitories for healthy children, Day-rooms, Dining-rooms, Class-rooms, Workshops, Probation Wards for the reception of children before admission, and Infirmarys. In examining the condition of the ventilation considerable use was made of pastilles, for tracing by the smell the direction of movement of the air, whether the air supply was drawn from a neighbouring room or closet, and how long a time was occupied in removing the fumes of the pastille from the room.

In conducting the inquiry, special attention was given to the consideration as to whether the arrangements for ventilation were such as could be effectively and satisfactorily used, with due regard to warming, "by moderately intelligent persons desirous of using them for that purpose." But in this respect the Report shows, again and again, the danger that openings intended for ventilation will be deliberately stopped as the easiest means of getting rid of a draught on a windy day, and then not opened again. On the general question of interference with ventilators, however, Mr. Shaw makes the following observations :—

"I cannot regard it as at all blameworthy to reduce or modify the ventilation by closing certain openings during weather of exceptional severity. Such closing should, of course, be associated with the responsibility (not always recognised) for opening them again when the special circumstances have passed away, but to form an adequate opinion of the manner in which that responsibility has been treated in the several cases would involve a prolonged inquiry extending for each school over typical periods of weather, and as such an inquiry was clearly beyond my powers in the limited period of my inspection, I thought it best not to enter fully upon that side of the subject. I desire, however, to make, in due course, a recommendation on the

matter. The supervision of the management of the appliances for ventilation would, I think, be most satisfactorily provided for by issuing instructions to those in charge of a particular room enumerating the appliances for ventilation provided in the room, with directions for their use, specifying under what circumstances certain of them should be kept open or closed. It would then be an easy matter for a superior official, or the medical officer, or an inspector, to notice on any occasion whether the instructions were complied with, and in case of any departure from the instructions, to learn the reason. Such instructions would have to be, in the first instance, somewhat tentative, for, taking as an example the case of a schoolroom, the children and the teachers are probably not used to similar conditions—the children are very much in the open air, spend comparatively very little of their time in gas-lighted rooms, and can apparently endure without discomfort a draught which the teacher would find injurious to health, and would be disposed to exclude at all costs. The instructions must necessarily have regard to both classes of inmates."

Mr. Shaw is, naturally, no believer in the effect of cowls and other contrivances dependent on the natural movement of the external air. He mentions in one paragraph a number of such contrivances in various schools, and sums up with the remark, which has often been made in these columns, that as these are all dependent for their motive power on the wind, which is notoriously capricious, the direction and amount of the movement of the air in them is also capricious, "and each opening must be regarded as a possible inlet or outlet according to circumstances."

In regard to open fires, the supplies of warmed air by Galton grates and other similar grates are noted as acting very satisfactorily, "but their purpose and mode of working was not generally understood by those in charge of them." At Hanwell school, however, which was furnished with grates having fresh air inlets, the smoke had found its way into these inlets, and their use for the supply of fresh air had been practically given up ; which is a warning of one possible cause of failure in such arrangements. In regard to steam and hot water radiators with air introduced behind them, it is noted that in many cases these radiators were placed so that they could not be got at to be cleaned, and the incoming air was in consequence fouled by accumulations of dust, and the Report speaks strongly as to the necessity of constantly cleaning such radiators, a point which we fear is often overlooked. The Report makes the same note with

* "Report on the Ventilation and Warming in certain of the Poor Law Schools." By William Napier Shaw, M.A., F.R.S. London : H.M. Stationery Office.

"Report by Sydney Stephenson, M.B., on the inquiry undertaken by him at the request of the Local Government Board upon the Ophthalmic State of Poor Law children in the Metropolis." London : Eyre and Spottiswoode. Edinburgh and Glasgow : John Menzies & Co. Dublin : Hodges, Figgis, & Co.

regard to air ducts, a difficulty which has of course long been recognised in the case of every kind of hollow pipe or tube for the admission of air, but it has not been sufficiently borne in mind that outer surfaces which are to warm incoming air require cleaning also, and should be placed so that this can be easily done, or else it will not be done. The suggestion is made that an automatic apparatus for registering the state of the air in crowded rooms, in regard to purity, just as the temperature is registered by the thermometer, would be of the greatest value; but though the author refers to such an apparatus as in his possession, he admits that he has not yet succeeded in putting it to the test of practice.

Coming to the Report on special classes of rooms, it was found, by the pastille test, that the provision of a cross ventilated lobby between the water closets and the dormitory did not ensure that the latter should not be supplied with air from the former, and it is advised that the water closets should have a separate extraction flue actuated by a gas-burner. To this we may add that our experience is that a more powerful gas-burner is necessary than is usually employed for this purpose, in order to produce an efficient extract. The observations made as to the effects of cross ventilation by partially opening the windows are carried to great length, and we can only recommend a reference to them; they are made for various cases, in regard to the number of rows of beds, the existence and extent of other air-supply, &c.; but the following are the general conclusions arrived at:—

"1. Unless care be taken to have windows open at both sides of the dormitories, the air supply will be insufficient to maintain the freshness of the dormitories within the limits of respirable impurity.

2. The amount of window-opening required for the ventilation of the dormitories with large numbers of rows of beds is greater than the officials would naturally provide, and is indeed so great that the wind would blow through the room without any mitigation, and such dormitories in ordinary use would not be effectively ventilated.

3. The ventilation would depend very largely upon the wind, and would fail when the wind was very light.

4. In those cases in which the ventilation was effective the temperature of the dormitory would follow closely that of the outside air, and would not exceed that of the outside air by more than about two and a half degrees.

I may also add two practical conclusions.

5. The exposure of the window openings to driving rain makes it unlikely that they would be kept open in bad weather.

6. Though it is better to open all windows a little than to have one pair widely open and the others shut, the latter is the arrangement which can be carried out with least trouble."

It is not an unnatural result from these considerations that the Report recommends the consideration of ventilating dormitories of this kind by mechanical power, but with the reservation that the apparatus should be such as to run for eight or nine hours every night without attention. Cross ventilation might be retained for the narrower dormitories, supplemented by hot-water radiators under the windows; but the wider ones cannot be kept adequately ventilated by this means, except with the drawback of having so much open window surface as to lower the temperature too much, besides the question of rain.

Dining halls are in use for so short a time at once that the question of warming is of more importance than ventilation. Among the points noted in this portion of the

Report are, that the difference between the heating required in summer and in winter is not sufficiently provided for; that steam pipes laid in a trench and covered with an open grating are certain to collect a quantity of dirt—they should be covered solid on the top and with the gratings at the sides, if put in trenches at all, which is however always undesirable; and that direct communication between the school or workshops and the dining hall should be avoided, which is of course self-evident, but a case is mentioned (Edmonton School) in which it occurs. In schoolrooms the Report recommends mechanical ventilation more decidedly than for dormitories; the amount of open window required to keep them satisfactorily ventilated by cross ventilation would be so large that it would in practice almost certainly not be used, and it could not be in cold weather. Open fires are unsatisfactory for warming through not distributing the heat sufficiently, while hot-water and steam pipes give so little head for ventilation that this must be provided for otherwise. Infirmary at a Poor-Law School are under the same conditions as other Infirmaries, and require no special consideration; but the following remark at the close of this section is significant:—

"The habit of supposing that the ventilation was provided for when the building was erected and need not be further considered is exceedingly widespread. In my experience there are very few persons who know where their ventilators lead to or where their air-inlets lead from. . . . I only now refer to the matter to urge the desirability of having information as to the provision made for warming and ventilating definitely set forth for the use of those in charge."

The most practically valuable portion of the Report, however, is the long series of tabulated observations appended to it, giving for each room examined the means of ventilation and warming employed, with marginal notes on the results. These tables should be studied by architects; they are very instructive. The failure of the extract ventilators of the cowl type is noted over and over again. In one case we read: "Two large air-pump ventilators"; then in the margin: "The Boyle ventilators and cowls were not acting." In another case: "Rooms numbered 5 and 6 have Boyle's air-pump ventilators, but that in No. 5 was closed, and in No. 6 the air went out a little, the rate varying with the wind." In another: "Many of the air-gratings are overgrown with ivy"—a contingency probably seldom taken into account. In another case: "Skirting covered with perforated zinc; thirteen extraction shafts;" and in the margin—"The skirting was removed in one place, and two inches of fluff was found. . . . No indication of flow at openings of extraction shafts."

Another note is—"The gratings for the supply of warmed air are very closely related to the extract opening in the chimney flue, so that in all probability a good deal of warm air would escape without being used." There are pages of memoranda of this kind, showing what a total failure many of these ventilation systems are in action (or in non-action). We may close our extracts, which but for considerations of space might be extended to much greater length, with the following, which relates to certain dormitories:—

"On the top floors there is direct communication by means of 9 in. by 9 in. openings with the roof space.

The extraction shafts were tested for flow in many in-

stances, with very varying results; in many there was no indication of flow; in III. senior, air was coming down the shafts on both sides of the room, and going out by the door and probably also by the skirting; in IV. there was a vigorous outflow. It is thus clear that the shafts may act as inlets or outlets according to circumstances. In the former case they draw air from the roof space, which may be fouled by the air derived from other rooms, so that the system is on that account open to objection, unless some head is provided which will govern the flow through the shafts. If the shafts are to be regarded as inlets or outlets, according to circumstances, they ought to be periodically cleaned, but there is no provision for that purpose.

The perforated skirting has in all probability become very foul in the course of time, and certainly was so at the point tested; from the point of view of the spread of disease, it is a source of danger, unless it be cleaned and reclaimed periodically."

As we have already said, Dr. Stephenson's report upon the ophthalmic state of the Poor Law children is mainly a medical report, but certain points crop up in it which are necessary for the consideration of the architects and the managers of such schools. Ophthalmia of nearly every type is obviously very infectious, and one constant source of infection arises from the use of the same baths and lavatory basins; children washing in one long trough or bath for instance, in the same mass of water. For baths Dr. Stephenson recommends that instead of vessels filled with water, spray baths should be used, soap being used while under the spray; a method which entirely precludes the same water being touched by two children. The evil of the promiscuous lavatory troughs is said to be increased, as may well be imagined, when they are made of wood, a material which should never be used for such a purpose; there are several references to this point in the Report. The importance of each child having its own marked towel is also referred to strongly, and though this is mainly a point for the school managers, the architect will facilitate its adoption by providing proper space and appliances for hanging the towels on numbered hooks; the existence of this facility may make all the difference as to whether the system is carried out or not. The following is a description of a well-arranged lavatory at the Hanwell School, the school which has been "cut" into separate blocks and re-arranged internally under the supervision, we believe, of Mr. Gordon Smith:—

"The lavatory is a well-arranged apartment, with a jet apparatus that merits a few words of description. It consists of a 1½-in. supply pipe, with nine projecting nozzles on each side. These nozzles are simplicity itself; each is a conical piece of brass perforated upon its under surface by three fine holes, and screwed into a socket upon the distribution pipe. An enamelled earthenware trough, supported by glazed bricks, is placed 22 in. below the jets, so that plenty of room is left for washing. The trough has a fall of 1 in. in 16 ft.; its outlet is shielded by a 4-in. grating. The floor of the room is covered with red paving tiles, laid in cement, and given a fall towards a 3-in. channel at the base of the enamelled bricks. By this means water splashed about flows away rapidly. The room is warmed by an open grate, with 24-in. fire. Lastly, a wooden towel-rail, with numbers and pegs for towels, and slots for hair and tooth brushes, runs around three sides of the lavatory."

Though ophthalmia is often introduced into a school from outside sources, and other defects of sight are born with the child, and cannot be justly laid to the charge of the school, they are aggravated by deficient lighting, and in regard to this Dr. Stephenson quotes a German authority, Cohn, to the

et that a school should have one square of glass to every five square feet of floor. In England, says Dr. Stephenson, there is less diffused light than in Germany, and this ratio should be considered as a minimum; "even then the windows would be of good height, not broken up by many sash bars, properly distributed in the walls of the room, and not obscured by neighbouring buildings." Another point which is referred to may be taken into account in regard to all kinds of schools and other buildings where there are dormitories for a good many persons, young and old; this is, the habit of providing a special cubicle in the dormitory for the use of an officer or inspector. This offers a great hindrance not only to light but to the circulation of air; and Dr. Stephenson suggests that, if cubicles are necessary, they should at all events be formed of light movable bamboo frames draped with some suitable material, so that they can be moved for purposes of cleaning and ventilation. It is important to note that when encephalitis has once got possession of a school it appears to be almost as difficult to eradicate as dry-rot; two or three schools which were described by Mr. Nettleship, especially bad twenty-two years ago, have the same reputes up to the present time, and only a complete refitting or removal of the interior of the building, as has been done at Hanwell and one or two others of the Poor Law Schools, will eradicate the disease.

TWO BOOKS OF CLASSIC DETAIL.

OF the two large folios referred to, each illustrating Classic architecture, one is a very old friend, being no other than Normand's *Nouveau Parallèle des Ordres d'Architecture*, long out of print as was supposed, of which there has been a kind of partial resurrection in the shape of about eighty copies which had been confiscated a good many years ago as the result of some legal proceedings, and have recently been recovered from their hiding-place, we do not know under what circumstances, nor does it much matter. But it is interesting to see a copy again of what one has regarded as a book of the last generation, and out of which some of the older among us made our first commencement in the study of architectural design. And as long as the *Ordres* are regarded as an engine of architectural study, Normand cannot be considered as a book out of date. It is a better book than such, the plates are more finely executed, whatever opinion one may have as to the value of "the *Ordres*" in modern architecture, their historical value will always remain, and Normand is one of the best standard records of them.

At the same time it is curious to be reminded how completely Classic architecture, including Greek, was considered, at the time this book was first published, to be a purely artificial and conventional thing which could be represented by mere mechanical drawings giving the sizes and contours of the main portions of a building, and leaving its general effect entirely out of the question. There is a plate of comparative sizes, scale, of the *Ordres* of various temples, not a single delineation of a building as a whole. The importance given to the reading of the *Ordres* by the Renaissance archi-

tecs, which occupy a large portion of the book, though they were only what may be called an imitation of an imitation, is also significant of the period, and one may add, the place; for this was a French book, and the French are even now, in their student period at all events, more in bondage to the *Ordres* than other nations, though the American architects seem rather inclined at present to put themselves into the same fetters. The careful but entirely mechanical manner, also, in which capitals and decorative details are drawn, only to a small scale and with the greatest rigidity of repetition, has the effect of reducing the whole still more to a kind of paper architecture, scrupulously correct as far as the draughtsman's intentions went, but totally without life; while the importance of full-sized sections or details hardly seems to have occurred to the compiler. On the other hand, the careful way in which the module system of proportion is worked out makes these elaborate diagrams very valuable to the student; and in fact the work is a monumental one of its type, and in that sense has not been equalled; it is one of the books without which no architectural library can be complete, and some of our readers may be glad to have a chance of securing a practically new copy of a work which otherwise is only to be had second-hand, and is rare as such.*

What a contrast is offered by the other book, the last new work of to-day, on Greek and Pompeian Decorative work,† by Mr. J. C. Watt. This is illustrative of the new spirit in which Greek detail is now studied. The book deals with decorative detail purely for the sake of its beauty, and with no reference to academic rule, and in every case where the size of the object and the limit of the page allowed it, the ornaments have been drawn full size. It is interesting to compare the idea we get of the delicate alternating ornament above the necking of the Erechtheion column, as shown by Mr. Watts, with that obtained from the small line drawing in Normand. This of Mr. Watts's is probably the best, it is certainly the most beautiful drawing of this ornament which has been published; and the execution of this and other ornaments in the book has evidently been a labour of love. The Greek ideas in ornament may be said to have been limited; one meets with the same *motif* again and again, but then how perfectly designed and how satisfactory they are, when at their best at all events. There are some, such as that on Plate IV., which show the same ideas in a somewhat cruder form; the one referred to must be almost an archaic specimen, and shows very strong Egyptian influence. What a difference again when, after turning over the leaves of the best Greek ornaments, we come to the first specimen of Roman ornament, carefully made out, but, comparatively, so clumsy and heavy in line. An interesting Greek example is the capital from the inner Propylæa at Eleusis (Plate 25), which we gather is now published complete for the first time, a capital with the angle intact having been recently found; the place of the volute is taken by a kind of ram-horned griffin. Some of the Pompeian examples are unfamiliar, and have an added interest on

that account. A portion of a semi-circular bronze stand for two statuettes, from the Naples Museum, with a very delicate leaf inlay in silver and copper round the edge, shows how much of the Greek spirit survived in Pompeii, that Brighton of ancient Rome, though there is just a little more of naturalism in the design of the spray than a Greek artist would have permitted himself.

This is one of the best drawn and most charming books of illustration of Classic ornament which has been published, and does high credit both to the taste and to the patience and ability of its author; and the publisher must share the praise for the beautiful manner in which the book is got up.

NOTES.

The A RATHER singular letter by Westminster Improvement Mr. Norman Shaw on the subject of the Westminster Improvement Scheme has appeared in the *Times* since the date of our last issue. Mr. Shaw says he wishes to "correct two errors which have arisen" with regard to the scheme, and continues:—

"It seems very generally thought that an insufficient space is to be given to the extension of the Embankment. So far from this being the case, it is intended to make it quite as wide as that portion of the Embankment with which it will be ultimately connected—a width, in my opinion, amply sufficient to give dignity to the scheme. Secondly, there appears to be an impression abroad that the picturesque surroundings of the Abbey in which Great College, Cowley, and Barton streets are situated are to be swept away; as a matter of fact they will not be touched by the proposed scheme. . . . The errors which I have corrected probably have arisen from a too hasty survey of the rough sketch deposited with the Bill, instead of from a study of the final arrangement of the scheme."

This seems to be an ingenious, but not quite fair, method of apparently putting the original objectors to the scheme in the wrong, by suggesting that they had made a mistake in their criticisms. They have made no "errors" whatever. The criticisms made in the *Builder* of January 29, and by Mr. E. P. Warren in the *Times* about the same period, were based on the plan as then contemplated, and we received the particulars of the scheme from the engineer to the Company himself, no architect having been at that time appointed. After these and other criticisms had appeared, the Company evidently saw that it would be necessary to meet some of these criticisms, and it was obviously in consequence of this that they engaged an eminent architect to revise the scheme. That was the best thing they could do; but we do not see why the facts should not have been plainly stated.

ANOTHER Employers' Liability Bill was read a second time in the House of Commons last week. It was introduced by Sir Arthur Forwood. It could hardly be said to be either opposed or approved by the Government, and so was read a second time by a large majority. As Sir Arthur Forwood has undertaken to give up the second clause of his Bill when it gets into committee, we see no reason why it should not pass into law during the present session. The long and the short of the measure is that it abolishes the doctrine of common employment in regard to workmen who fall within the Act of 1880. We confess that piecemeal legislation of this sort is unsatisfactory. The

* The copies bear the former publisher's name, Lacroix, but are now in private hands.

† "Greek and Pompeian Decorative Work." Measured and drawn by James Cromar Watt. London: B. T. Batsford. 1897.

doctrine of common employment is really quite modern, and it might just as well disappear from English law once and for all. Killing it, so to speak, by degrees only, makes those cases in which it is alive seem greater hardships. However, we have now only to note the fact of the second reading of this Bill, and it is to be hoped that, as the Government decided not to oppose it if the House of Commons wished to pass it, they will make arrangements so that it may become the law of the land as soon as possible. It is unsatisfactory, from a business point of view, to have measures of this kind hanging over the community. When they are within measurable distance of completion let the legislative work be done quickly, so that employers and workmen may understand the practical position.

Burial Grounds. A PARLIAMENTARY Committee has been appointed to inquire into questions relating to burial grounds. So far as appears from the order of reference this committee will not be empowered to inquire into the situation of burial grounds and their effect on adjacent properties. It would be very desirable that this point should have been inquired into. Fees may be important, but the living are perhaps more keenly interested in the sanitary effect of burial grounds than in any other point. No doubt the management of local burial grounds requires looking into, but it would be also desirable to formulate some rules in regard to new burial grounds. It is often to be seen that when a village churchyard grows too small a field close at hand, in the middle of a village, is taken as an additional burial ground. This is a thing which ought not to be allowed.

Government Expenditure on 1899. For the year ending March 31, the following sums are apportioned:—To the National Gallery and the Tate Gallery (Millbank), 16,274*l.*, including 5,000*l.* for purchase of pictures; National Portrait Gallery, 6,025*l.*, including 1,104*l.* for purchases; Wallace Gallery, 5,927*l.*; National Gallery, Scotland, 4,400*l.*; and National Gallery, Ireland, 2,504*l.* The total under the head of Education, Science, and Art amounts to 11,965,796*l.*, being an increase of 457,094*l.* The total of 1,910,431*l.* for Public Works and Buildings shows a net decrease of 57,279*l.*; amongst the items are:—Public buildings, 271,000*l.*, including 25,000*l.* for alterations at Hertford House recently purchased at a cost of 80,000*l.* for housing the Wallace collection; Royal Palaces and Marlborough House, 58,000*l.*, an increase of 24,000*l.*, including 15,000*l.* for the restoration of the State apartments and Banqueting house, Kensington Palace, with 3,500*l.* for the installation, in part, of electric light in Buckingham Palace; and Royal Parks and Pleasure-grounds, 115,000*l.* (increase, 12,850*l.*), which includes 6,600*l.* for completion of the new wing of the Temperate house, Kew Gardens, and 1,000*l.* for lighting more footpaths in Hyde, Green, and St. James's Parks. In the estimate for Ordnance Surveys, United Kingdom, a sum of 2,000*l.* is set apart, out of 22,500*l.*, for a revision of the 1-in. map of Ireland, and similarly, a sum of 1,000*l.* for a revision of the 2-in. map of Great Britain. Under Public Works and Buildings, Ireland, is entered 206,978*l.*, of which 2,000*l.* is on account for a commencement of the National Gallery Extension.

The Central London Railway.

As great progress is now being made with the construction of this line, it will be interesting to mention a few of its main features. Its total length is six miles and a half, and each track is in a separate tunnel. It is intended to supply a two and a half minutes' service of trains, which will run at an average speed of fourteen miles an hour, and each train will have seating capacity for 336 passengers. The central power-station will be at Shepherd's Bush, and will contain six three-phase dynamos, each of over 1,100-horse-power. Four of these will be required to work the line, the other two being held in reserve. There will be sub-stations at the Davies-street, Notting Hill Gate, and Post Office stations, the power being conveyed to those sub-stations at 5,000 volts, and then transformed down to 330 volts through stationary transformers. The current is then converted into direct current by making it pass through a rotary transformer, and transmitted to the line, which is on the third rail system. These rotary transformers are very much simpler in design than those in use at Dublin, and the necessity of an air-blast for the stationary transformers will produce a thorough ventilation of the sub-stations. Each locomotive has four 150-horse power motors, and is mounted on two four-wheeled trucks, each motor driving an axle direct. The weight of a loaded train with its locomotive will be about 150 tons; but, considering that the revolving parts of the flywheel dynamos will weigh 45 tons, and will make ninety-four revolutions per minute, plenty of power has been provided. The design of the line is thoroughly modern, and Mr. Parshall's success with the Dublin tramways, on a somewhat similar system, augurs well for this line.

German Brick and Lime Manufacturers.

THE last number of the *Notizblatt des Deutschen Ziegler-und Kalkbrenner-Verains* has reached us. It contains a verbatim report of the proceedings at the Congress of the German Association of Brick and Lime Manufacturers, held in February last year. Many subjects of interest to those pursuing these trades were discussed, such as improvements in machinery and methods, patent tiles, &c. It may be questioned whether, as a general rule, the verbatim reporting of discussions at meetings of this nature is worth the trouble it costs; all unnecessary and inaccurate remarks are thereby accorded an ill-deserved immortality. The report, however, cannot fail to be useful to those concerned with the industries to which it especially refers.

The Improvements at Bruges.

AT the time of the Architectural Congress at Brussels of last autumn, we called attention to the fact that the City Surveyor of Cologne, Herr J. Stuebben, had been commissioned to advise the Belgian authorities in respect to the development of the city of Bruges. We now hear that the necessary schemes have been prepared, and those who know Bruges will be glad to hear that considerable care has been taken not to spoil any of the characteristic features of the old city, though in many cases some difficult problems had to be solved, more especially in respect to the lines of the old City Moat and the Ostend Gate. A considerable section of the old Moat will be filled in, and a

new Moat dug to take the form of some ornamental waters skirting a boulevard of considerable dimensions.

Typhoid at Maidstone.

An article on "The Maidstone water supply and the typhoid epidemic," by Professor Wanklyn, appeared in *The Public Health Engineer* a fortnight ago. After considering all the evidence, the Professor has come to the conclusion that the epidemic was due, not to the water supply, but to the excessive rain of the latter half of August and the beginning of September, waking up "to sinister activity" the 4,000 elongated cesspools charged with foul, festering filth, continually producing air-polluting and disease-provoking vapours. We are not disposed to quarrel with Professor Wanklyn for saying hard things about cesspools in the midst of towns, and other insanitary arrangements, nor do we wish to minimise in the least the danger of breathing contaminated air, but we do think that the Professor's method of establishing his point—namely, by suppressing evidence on the other side of the question—is, to say the least, unscientific. With "the report issued by Mr. Adams and Dr. Washbourn" before him, it is strange that he should ignore Dr. Washbourn's conclusion, arrived at after careful bacteriologic examinations—"the Tutsham-in-Field spring was undoubtedly contaminated with animal excreta on both occasions on which it was examined; it contained an excess of bacteria, and many coli bacilli." Certainly the active typhoid bacillus could not be found in the water, but Dr. Washbourn declares in his report that "no importance can be attached to this failure. The nature of Professor Wanklyn's [method of controversy will be better understood when we point out that notwithstanding Dr. Washbourn's assertions quoted above, he concludes, "outside the imagination of the medical officer (Mr. Adams) there is no valid evidence of the pollution, during last year's summer, of the Maidstone branch of the Maidstone water-supply, and the fact stands out, with the greatest distinctness, that, between the outbreak of typhoid fever in the year 1897 and the water supply of the town, there was no connection whatever."

Builders' Ladders.

THE appeal case of Bennett Castle & Sons, briefly reported in our legal column, affords a warning to builders not to leave ladders in places where people may tumble over them, if they do so under orders from their employer, to be careful to have evidence of a definite order. The defendants in this case, doing work for some weeks at a house, left the ladders in the first instance on the grass-plot of the garden, but the owner objected, and told them to place them alongside of the walk (apparently against the fence). The plaintiff, a baker supplying the family, tripped against the ladders, received severe injury from a fall, and brought an action against the builders for damages. The builders' defence was that the owner had ordered them to place the ladders there, and he was responsible. The jury took the view that they only gave "permission" to put them there, and found for the plaintiff, a judgment which was confirmed by the Court of Appeal. The moral seems to be that if builders are "ordered" to put their ladders anywhere where they may cause an accident, the

and make quite sure first on whom the will fix the responsibility.

It is stated that a considerable portion of the grounds of this house, now occupied as a asylum, are about to be laid out for other purposes. The property occupies the site of Sutton Court, which appears from a print to have been erected *temp.* in the 16th century. At one time it belonged to Robert Earl of Somerset, whose countess died in 1632.* It then passed on to Philip, fourth Earl of Pembroke, and Lord Poulett, the royalist, whom it then living at Putney, often visited the Duke of Monmouth, and Richard, Ranelagh. In 1682 Edward Seymour sold it to Richard, second Earl of Cork and Earl of Burlington, whose great grandson built a bathing-house, and then, in collaboration with Kent (1729), erected the famous house after a design based upon Palladio's *del Capri*. In 1795 James Wyatt altered the house and added two wings. Lord Burlington laid out the grounds about 32 a., and the house was after the Italian mode. They are in the latter some statuary, vases, urns, &c., with three antique statues of Hadrian's villa at Rome, which had been in the collection at Arundel House, and the original portico of St. Paul's Cathedral, and Inigo Jones's water-gate, for Lionel Cranfield (Lord Treasurer, Essex), and a gift to Lord Burlington by Sir Hans Sloane upon the destruction of the Old Beaufort House. At Chiswick House died Charles James Fox, on November 13, 1806, and George Canning, on March 3, 1827, both, it is said, in the same room opening out of the Italian saloon. A summer pair of gates from Chiswick were inserted in the front wall of the house before his house in Piccadilly by the Duke of Devonshire, whose ancestor, the Duke, married Charlotte, Baroness of Lanesborough, only daughter of the Earl of Cork and Burlington. Her father established his claim as a descendant of Henry, Lord Clifford. Kent buried in Lord Burlington's vault in the Church, Chiswick, April, 1748.

EVERY year repeats the lesson that this Institute did not do the best for itself or for the public which it represents by building houses so extensive that it is impossible to see the walls except by lowering the level of work. There are always some works, a great many mediocre ones, a certain number of very bad ones, ought not to be hung in any exhibition claiming to represent high-class art. It would be well at all events to keep the line lower, since the length of wall in large rooms has to be occupied. A number of works, on the line only, will give a much better result than this exhibition. Among the points of the exhibition are several drawings of architectural subjects by Mr. Fulleylove, and a fine view of the Parthenon from the Propylæa (42). Mr. Weldon's "Court of King James," p. 113, and "Recent Occurrences," August 6-13, September 10-17,



Tullibardine Church.

been doing in silver-point, but they are not quite so successful as the silver-points. The President's "Jacqueline" (357) is quite in his best manner in regard to colour and execution. Mr. Gulich exhibits a rather striking, though sensational work, "The Violin Concerto" (435), a young woman in a rapture of genius playing the concerto, backed by the band, who by the way seem to consist entirely of string players—too many violins and no "wind;" but the work is a striking one. Among the works worth attention are those by Mr. Wimpey, as usual; Mr. David Green's "Misty Morning Polperro" (45); Mr. Hughes-Stanton's "Harvest disturbed by rain" (92); Mr. Wetherbee's "A Lonely Shore" (179); Mr. East's "Haverstock Hill" (187); Mr. John White's "The Brook by the Sea" (194); Mr. G. Marks's "A Sandy Road" (87); Miss Dora Woodhouse's "In the Rest" (325), an admirable sketch of a seated model wrapped in a blanket; Mr. C. E. Johnson's "Across the Common" (335); Mr. C. Green's "Ecarté" (351); Mr. Almond's "Camille Desmoulins" (373); Mr. H. J. Stock's "Mrs. Osmaston" (426); Mr. Stock seems to have deserted his ideal figures for portraits; Mr. Weedon's "Gravel Pits, Fittleworth Common" (527); Mr. Orrock's "Barford Mill" (549), a fine broad breezy picture, but the trees a little too conventional; Mr. Joseph Knight's "Summer Time" (587); Mr. C. E. Johnson's "Loch Lulla" (601), and Mr. Townley Green's pretty fancy "A Duet" (602), played by a living girl and a bronze statue—though this has been done before by a French artist.

THE "Union des Femmes Peintres et Sculpteurs," which has exhibited for sixteen years at the Palais de l'Industrie, has taken refuge in the Georges Petit Gallery, where they show 554 paintings and drawings and twenty-three works in sculpture. Of these latter, about the only one worth mention is a terracotta bust by Mlle. Kjellberg. The paintings offer the usual spectacle of a few able works nearly lost amid a crowd of commonplaces; flower studies, still-life studies without any distinctive style or any power of colouring, genre pictures poorly conceived and poorly executed. Among the happy exceptions are a coast scene by Mlle. Espinet, a sea-piece by Mlle. Elodie Lavillette, and a genre picture of rural life by Mlle. Loire, noticeable for its charm of colour. We may also mention the miniatures by Mlle. Dibelle-mont-Chardon, and some studies by Mlle. Mauny-Adam and Mlle. Camille Metra; and

that is about all. At the Cercle Artistique et Littéraire, Rue Volney, there is a small exhibition of water-colours and other drawings, among which are some good pastels by M. Vidal, lithographs of much spirit and humour by M. Jean Veber, water-colours by M. Allongé and M. Grolleron, and an important set of drawings in Indian ink made by M. L. E. Fournier as illustrations to Coppée's work, "Le Passant."

THE ARCHITECTURAL ASSOCIATION: SCOTTISH ECCLESIASTICAL ARCHITECTURE.

A MEETING of this Association was held on the 11th inst. in the meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. Hampden W. Pratt, President, occupying the chair.

The minutes of the previous meeting having been read and confirmed, Messrs. A. T. J. Harris and H. Wyllie were elected members of the Association.

On the motion of Mr. E. Howley Sim, senior hon. sec., a vote of thanks was accorded to Mr. C. W. Stephens for permitting members to visit recently Claridge's Hotel, Brook-street, W.*

Mr. Hippolyte J. Blanc, R.S.A., then read the following paper, entitled "Scottish Ecclesiastical Architecture in the Fourteenth and Fifteenth Centuries."

To attempt anything like a detailed or systematic examination of the church architecture of Scotland of the fourteenth and fifteenth centuries is not here intended. The variety of detail those periods exhibit makes their study very interesting, but there is too much in them for one evening's review.

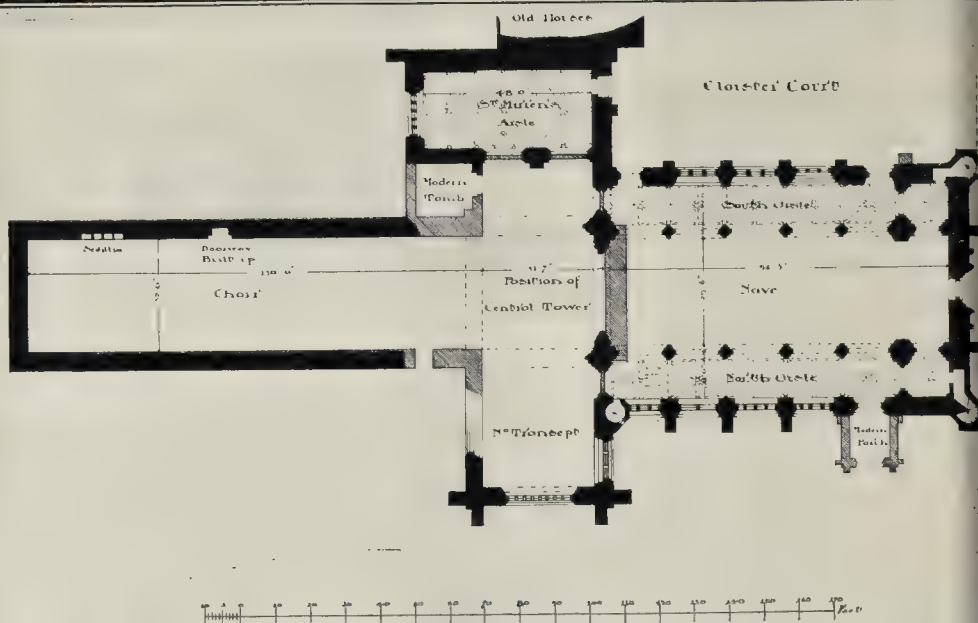
I hope to satisfy you with a sketch of some of the most prominent examples, which may form leaders to much of like form and detail to be found in many smaller works, and to endeavour, as far as possible, to assist you, in your knowledge of the English work of the same time, to compare, from the illustrations, the contemporaneous architecture in Scotland.

One cannot pretend to be very accurate with regard to the precise dates of each and all of the examples selected, because of the special difficulty all students of Scottish work have experienced in chronologically placing them. This may be better realised as we proceed.

To many here who may have extended their studies of church architecture beyond the confines of England into Scotland, it will doubtless be at once apparent why this particular period of our church examples should be selected; but to those who have not had that opportunity some preliminary words of explanation may be acceptable. In a word, it is the church work of the fourteenth and fifteenth centuries (and for that part the first half of the sixteenth century also), which will be found to be more distinctly Scottish than can be said of the works of the centuries preceding.

The most casual observer of church forms and details of the eleventh and twelfth centuries in France and in England will readily trace their genesis in the one country, and their acceptance and adoption in the other. During the early part of the Middle Ages, when, under

* For a short description of the new building, see our issue for March 5, page 234.



Plan of Abbey Church, Paisley.



Oldhamstock Church.

the freshness of enthusiasm, Christian emigrants rapidly spread themselves all over Europe, Scotland also received the foreign influence, and readily accepted the progressive developments of architectural forms and details which the church building fraternities brought with them. I do not suppose that any one has contended that Scotland, during that early period, expressed a style of her own, or even evolved then any very distinctive individuality in her treatment of churches; she rather adopted, under the guidance of her church patrons and founders, the characteristics of both France and England.

So we find that during the Romanesque, Norman, and First Pointed periods of church building, there is an evident parallelism in the works of France, England, and Scotland, on

to the thirteenth century. In England, church builders accepted the leading from France, while there are evidences that she showed some individuality in the treatment of details. In Scotland, the French influence for long was strongest.

In England, the general proportions differed from those in France, English cathedrals of the twelfth and thirteenth centuries are wider, but not so lofty as those of the same era in France. In this matter Scotland seems to have followed more closely the French models. English work shows more restful consistency and solidity, but seems to lack the rich grace and elevating continuity of forms—the emotion—of French examples. Whether Scotland in her works of that early time ever reached the great flights of

skill and poetic expression witnessed in French examples, we have perhaps lost the means of determining. Wherever, however, remains of her early works are found, there is enough to show that, while her buildings do not vie with those in England in respect of magnitude or richness, yet as regards elegance of composition and expression of discipline, refinement of detail, the abbeys and cathedrals of Scotland can claim equal merit; they possess the same grace; they show the same skill in execution. Her church designers have exhibited equal ability and her artificers have proved themselves to have been equally capable of those of other countries during all periods to the end of the thirteenth century.

In Scotland, the buildings were fewer and smaller dimensions. Chronologically they are several years later than are the English examples, but in plan, general treatment, and the order of development they do not differ much from their prototypes.

As illustrative of the differences of dimensions of contemporaneous cathedrals in England and Scotland the following examples may serve.

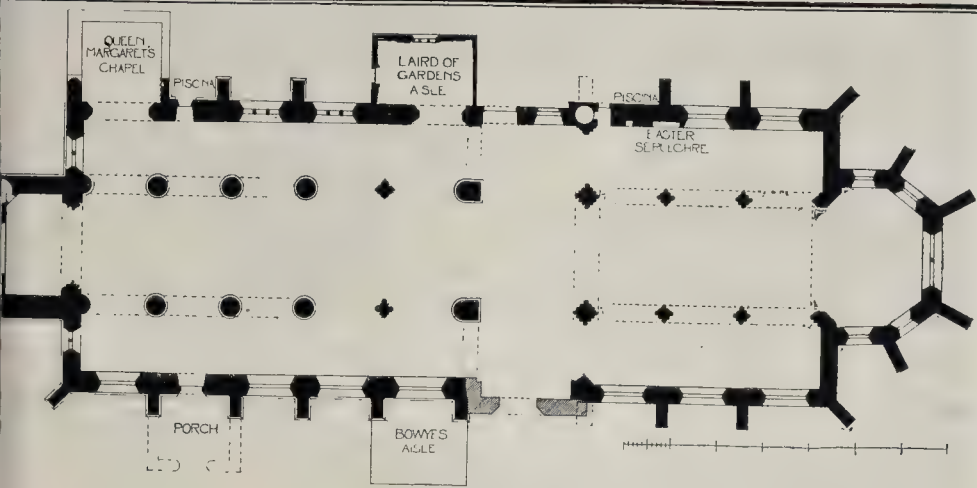
York	524 ft. in length...	St. Andrews...
Lincoln	482 "	Glasgow
Salisbury	474 "	Elgin
Durham	461 "	Kirkwall

Scotland's equal pace with England in progress and expression of her church architecture is readily understood when we remember that at this time the Norman barons, encouraged by David I., and tempted by the promise of gifts of lands, spread and established themselves and their families all over the remote parts of Scotland, following the great example of "that sair sanct for the Crown," four bishops, and for centuries became patrons and superiors of bishops and also the founders of abbeys.

Those noble Norman lords and knights, carried with them from time to time, a love of war and the chase, a desire to foster the arts of peace, more especially in the form of church building, and found them liberally encouraging the Church, turn by gifts of lands, &c., in which the abbeys as Paisley and Melrose shared largely.

Parish churches also, as were required, built by those barons, and were afterward, with the consent of the bishops, conferred in property upon the great monasteries and religious Houses of Regulars.

The singular uniformity characterising ecclesiastical buildings of the twelfth



Plan of Stirling Church.

enth centuries would seem to indicate
fraternities of church builders assisted in
g the beautiful edifices found over
se. Rickman reminds us that when
Gothic was developed the whole western
aces of France were under the dominion
English Crown, and that Normandy had
for a century or more part of the same
om. Thus Norman knights and church-
ould find ready access to England and
nd, and carry with them the progressive
pment of church style. In many cases
now that monastic buildings in Scotland
subject to the rule of the French monas-
from which the communities branched,
if anticipating Pope, who enjoins:—
y builds a church to God and not to fame,
ld never mark the marble with his name,

chitects of those great cathedrals have
t any record of their names. If, as we
e, those buildings were the outcome of
gregation of thought by fraternities, the
ation is apparent.

re is no doubt that churchmen studied
ecture, and were for the most part
cts of their own buildings, being aided
counselled in matters of taste by the
ers of church-building fraternities
y referred to.

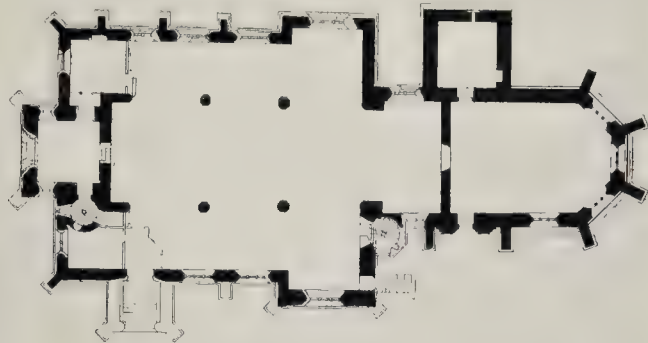
fluence of England at this time upon
tish church architecture must have been
se very important, because we know that
rgy who served in the Scottish churches
ther priests from England or kinsmen
Anglo-Norman founders born in Scot-

"Of the fifteen prelates who were
to the primatial See of St. Andrews
the twelfth and thirteenth centuries,
designated themselves 'episcopi Scotorum,'
he appears to have been a Celtic Scot,
a few sprang from the Anglo-Norman
of Scotland, the great majority being
and Normans from England." There
have been much interchange besides,
e we are informed that monks from
e became abbots of the Yorkshire
tery of Rievaulx, the parent house;
e also sent abbots to other Cistercian
including Kinross, Cupar, Newbattle,
and Balmarnock.

he warlike nobles, patrons of the Church,
in a state of preparedness for war,
e the natural protectors of the unarmed
who thus enjoyed unmolested security
ing their building operations.

influence upon the country by the build-
an abbey was great. A long period was
required for the work, and during that
members were continually in the midst
practice of all the arts—painting, sculp-
ture, architecture, as well as of the orna-
ment works, for these were all practised
er. The highest taste was thus cultivated,
terwards disseminated for the greatest
of the country.

these influences may be added zeal for
n, a high ideal, a generous rivalry



Plan of Dalkeith Church.

between convents and a desire to render the
church ritual magnificent—each and all of
these gave impetus to church work in Scot-
land, and kept it full of vitality and abreast of
the best work found elsewhere.

The industrial and social life of Scotland up
to the thirteenth century were likewise in a very
flourishing condition. In 1249, when the Earl of
St. Pol and Blois (a great French lord) was
preparing to accompany St. Louis (IX.) of
France in his memorable expedition to the
Holy Land, builders from Flanders, Marseilles,
and Genoa were employed for the armament,
and Scotland supplied from Inverness one
of the great ships, which gained much
admiration. The burgher and trading classes
also amassed great wealth, and gave generously
of their lands and means to the Church.

Scotland was thus a centre of intellectual
culture, and enjoyed at this period more peace
than fell to the lot of English monarchs.
But all at once all these favourable con-
ditions changed. By the sudden death of one of
her most enlightened kings, Alexander the
Third, in 1286, Scotland's lamp of prosperity
and progress was unhappily extinguished,
only to be rekindled after a long interval.
The succession—an effort to arrange which
had been counselled during the lifetime of the
king—was now brought to open dispute.
England essayed to adjust the matter by
placing a king, under vassalage to her. This
was resented, and wars followed between
England and Scotland, and it was only towards
the close of the fourteenth century that Scot-
land began to show signs of returning restful-
ness and prosperity.

The effect upon Scotland's architecture was
disastrous. Scarcely any new buildings were
undertaken, and under the wars many of the
finest of those existing were greatly damaged

Her patrons—the wealthy nobles—had left the
country, many to espouse the cause of
England's kings, to whom, after the death of
Alexander, they had sworn fealty. During
that interval of strife—upwards of eighty
years—England's church architecture had
developed new features, passing out of the
First Pointed to a new phase—the Decorated
or Middle Pointed. But when Scotland re-
sumed her church building her schools of
church builders had passed away; conse-
quently she had to go back and, so to speak, re-
commence the thread of architectural evolution
from where she had left it in the thirteenth
century. Even the monks had been cast adrift,
to find elsewhere the help their homes could no
longer afford.

In the beginning few churches were built,
but gradually, as returning prosperity in-
creased, Scotland became alive to what she
had lost in art, and in the fifteenth century
she came forward with renewed vigour
in the expression of a series of churches
distinctly of native growth and development.
The perfected First Pointed period, with its
refinement and purity, its gracefully clustered
shafts, lofty groined roofs, and elegant carvings
was, in England, virtually obsolete. A style
more massive had taken its place, the distinc-
tive features of which were a greater exuber-
ance of ornamentation, wider fenestration with
elaborate cusped tracery, pinnacled buttresses,
profusion of niches on walls and buttresses, &c.
All these were matured and were even passing
out of English practice when Scotland com-
menced again her church work. England had
actually entered upon her phase of the Perpen-
dicular. France, with the buoyancy and
vivacity of the race, rose out of her Decorated
work into the flow of a restless form designated
Flamboyant.

Thus Scotland, along with the examples of First Pointed in her midst, had the association of the Decorated and Perpendicular of England and the Flamboyant of France on which to draw for inspiration. The result we find is not an adoption of either, but a sort of adaptation of all, in which the work of the Decorated period predominates. Thus Scottish artists struggled bravely to regain for her a parallel place with other countries, and, though here and there comparatively unsuccessful, much of her later work of the fifteenth century and of that entering upon the sixteenth century exhibits a return of the native talent for graceful expression and skilful execution.

Of the contemporaneous works of England and France no doubt Scotland assimilated a good deal; but in all cases it would appear that she gave an independent character to the rechauffé. Thus her Perpendicular work, which is chiefly found at Melrose Abbey, with a scattered fragment here and there over the country, can scarcely be said to be merely a repetition of that in England. Moreover, with regard to the French influence of the Flamboyant of the same period, it will be found that Scottish examples really show very little of the actual forms of that style. The forms of window tracery, for instance, might be described as a transition between Decorated and Flamboyant. The construction is heavier, but the forms are more restrained than in the French examples, and are by no means inelegant. From a few examples of these on the screen we may be able to verify this.

Of Decorated buildings there are few entire examples in Scotland. They were not executed while that style was in practice in England. The Decorated style, however, lingered very late in Scotland, examples being found up to about 1462. The later examples are not so successfully treated, however, the best work being found in Lincluden, Crossraguel, the nave of Glasgow, Elgin Chapter-house, Linlithgow, and part of Melrose. After the date named the work in Scotland became very mixed and degenerate, and under later influences began to show a larger infusion of the contemporaneous work of her Southern neighbours.

During the centuries under review no cathedrals nor conventual churches were founded, yet many alterations and additions were made upon those existing. To Glasgow Cathedral was added the upper part of the nave in the beginning of the fourteenth century, while the sacristy, the tower, and the south crypt were added in 1425 and 1500 respectively. In these is manifested the lingering attachment of the Scotch to earlier forms, all beautifully blended in a most interesting manner with details of a later period.

But decaying piety and the comparatively diminished resources of the country brought about a reduction in the dimensions of her works. Hence we find, as fewer clergy were required, Scotland's chief works are the collegiate churches and chapels, of which nearly forty were founded in the fourteenth, fifteenth, and sixteenth centuries. David Laing says there were thirty-six erected all over the country in the fifteenth and first half of the sixteenth century. They present in their detail nearly all that is characteristic of the period. Many of them no longer exist. They were built and endowed for a society of priests, commonly in a place not within an Episcopal see. The society consisted of a Dean or Provost, or other President, and, under them, Prebends or Canons who had in the Church several degrees or stalls, where they sat for the more orderly singing of the canonical hours. They were instituted for performing divine service, for singing mass, vespers, &c., to the memory of the founders. They were divided into two kinds; one of Royal foundation, whereof the King is patron, confers the prebends, names the provost or dean, and the canons or prebendaries; the other, the foundation of barons, who, of their means, bequeathed grants to the church. Those churches were for singing of mass for the repose of the dead. Both in their services were regulated as in cathedrals, but were not under cathedral chapter control.

Generally, the plan is cruciform, or intended to be so (because a great many have never been completed), and comprises a central, or sometimes a western tower, a sacristy on the north side of the chancel and a porch on the south side of the nave. In one or two instances there are chantry chapels, sometimes

the addition of pious founders. Aisles are not common except in the largest of them. Roofs are plain, arched with ribs, but rarely groined. In one case, Roslin, the stone arch has no other external covering. In roof treatment there are many very interesting and quite unique features. Over the vaulting is laid a series of overlapping and guttered blocks of stone in parallel squares, in some instances at very high pitch and in others with but a slight elevation for water run. This form of construction involved much difficulty in cases where transept or chapel roofs rose up upon the nave roof. In such cases each section of the building was treated independently with gabled termination. This feature is met with all over Scotland, and seems specially a Scottish invention, being perhaps originally designed for her castles of much earlier date. It is not much met with in English work.

The forms of most of the buildings of this period being chiefly aisleless structures, gave special prominence to the windows. These were large, and arch-headed, of two, three, and four lights. They were not lofty, however, evidently to avoid cutting in upon the interior vaulting, and necessitating cross vaulting with its more intricate construction. In England, even, we find that notwithstanding the greater richness there is this express, the groined vaulting has at this time given place to plain surface vaulting, but decorated with a superfluity of ribs which are merely ornamental. In the same way, while we have a few examples of good vaulting such as in the south crypt of Glasgow Cathedral, in Trinity College Church, Edinburgh, and in the collegiate churches of the period—ornamental ribs are here and there found applied to surface vaulting, merely to give distinctiveness to a part of the interior of the building—such as the chancel at Seton Church. Other examples of this are at Melrose, and St. Mirren's aisle or chapel, Paisley. In Linlithgow and Stirling Churches may be seen some interesting manifestations of ingenuity in overcoming the difficulties of vaulting over the apsidal terminations of the choir. Fan vaulting is not found in Scotland. Roslin Cathedral already referred to (the plan of which resembles very closely the character of the choir of Glasgow Cathedral in its aisles and retro-choir) bears the simple pointed arch vault. It is, however, profusely decorated with ribs rising from the main piers, and, on the fields between, with an exuberance of carving, quite unique. The side aisles are vaulted at right angles to the choir vaulting, and in this way a greater elevation than would otherwise have been available is obtained for the windows. This chapel was founded in 1446, and while bearing in its charter that it was built by workmen from foreign parts, it possesses all the evidences of being of home manufacture. The details in moulding are those found on other collegiate churches of the period. Its buttress-framed quasi-porches are quite unique and thoroughly Scottish. For richness and interest in carved work it stands unequalled, in its small dimensions are considered, and in view of the fact that about this time French masons were numerous in Scotland, it is possible some were employed upon Roslin. This would explain the charter notice referred to. Each bay of the aisles is spanned by a pointed arch springing from a richly-carved flat arch between the nave pier and the aisle wall.

As formerly noted, while the Scottish churches of this period are designed to have nave, choir, and transeps, in many cases the nave has never been erected. A feature almost confined to Scotland at this time is the polygonal termination of the choir. It is to France, where it was very common, we must look for the prototype, for in English work it is not found in the late period, though Wells Cathedral possesses it. Of that form we have many examples, some showing externally merely a continuation of the main roof; others projected from the terminal gable of the choir as a bow window.

Of side chapels there are several, but they are either formed as quasi-transeps, or, as at Melrose, out of duplicating the south aisle of the nave in the same way as at Coutances. Elgin appears to have had chapels similarly constructed.

Other features, such as sacristies and porches, are noticeable in the work of this period—two of the porches, namely, at Linlithgow and Aberdeen, being remarkable for the possession of an upper Priest's Chamber or Parvise with a turret stair conveniently placed to reach it.

In doors of this period we have examples of the features of nearly all the preceding style. But it is noticeable that the round arched door is found most frequently through all the period of Scotch Gothic. In detail of moulding is nevertheless, usually conforms to that of the style of the building to which it is attached. Of double or twin doors of the period, we have interesting examples at Haddington and Ailsa, Linlithgow, both of totally different character and seemingly of different dates. Upon the question of dates, however, it is very difficult sometimes to trace the period of execution of the several parts from their mixed character. Defined as are the early periods, it cannot be said that the later are equally so. There is a line of demarcation marking the change from the Decorated to the Third Pointed in Scotland, such as one finds between the Decorative and the Perpendicular in England; the movement is so gradual in Scotland.

In external detail the Scotch Decorated period follows largely the suggestions of England and France. Mouldings are, however, broader in treatment, and carving not generally so fine. There are many exceptions, however, and very often one comes across an interesting monument or sedilia, designed and carved with such richness as to be suggestive of French influence of later date. Of such we have excellent examples in Bishop Kennedy's tomb at St. Andrews and elsewhere.

The towers of the period are very interesting, though perhaps not elegant. Placed at the crossing of nave and choir, or at the west end, they are usually sturdy features expressing a variety of form and finish. They are rarely in this period extended as spires, though the tower at Aberdeen Cathedral has spires in a later form. The most interesting form of termination of towers we possess is the cross as at Aberdeen Cathedral and St. Giles's, Edinburgh. Two others existed on a smaller scale, but were thoughtlessly recommended to be taken down through an unwarrantable fear of giving way. The origin of that feature has not been traced, I believe, but one English example, somewhat more elegant than Scotch examples, exists at Newcastle.

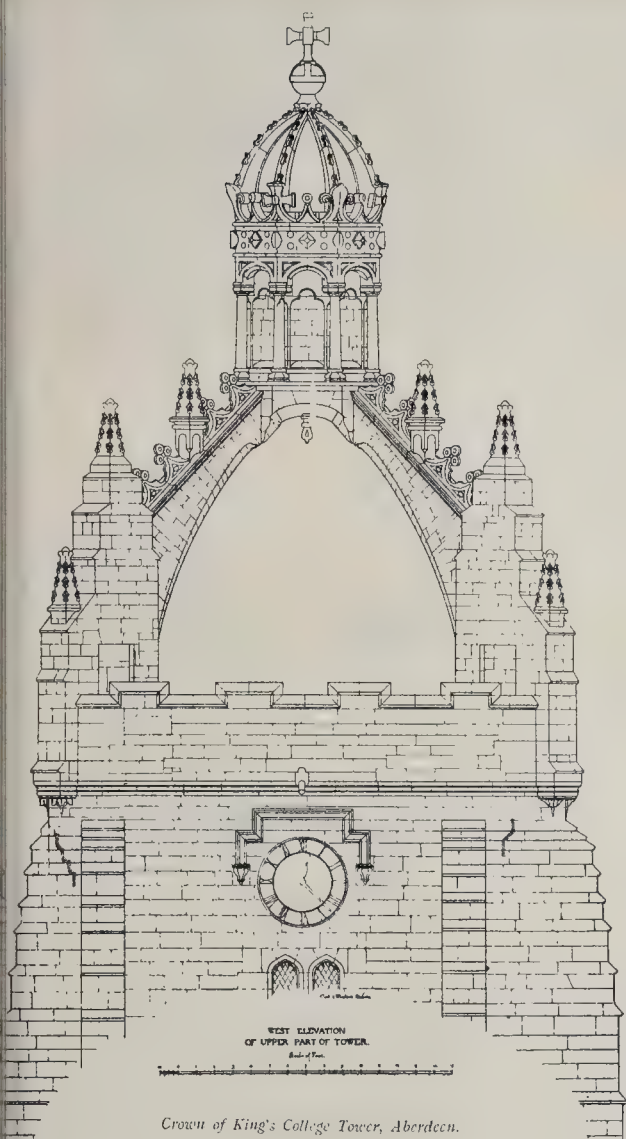
It is in the windows, however, that we find the most instructive expression of the period of work. There are many examples of pure Decorated work at the beginning, but as the fifteenth century progressed, the influence of the French Flamboyant is manifested itself. The tracery is, however, heavy, often clumsy, and in many character examples the cusped foliations are wanting. Forms are likewise traceable to English examples of a much earlier period. Instances of geometric design are found at Melrose, Dunkeld, Paisley, Tain, Crossraguel, Torphichen, and the reticulated pattern is found at Dunfermline Refectory. There are few of the English Third Pointed or Perpendicular type. Melrose, perhaps, bears the nearest approach to it, while a less extensive degree are other examples at Stirling, Linlithgow, and Corstorphine. At Melrose the south transept window with its gable shows rather a successful, and a unique, example of the combination of perpendicular, Flamboyant, and Decorated types.

Of carved woodwork we have, unfortunately, very little left us of the period. An easy way to fire, it is scarcely to be expected that it would escape in the track of the wars of the fourteenth century. At Dunblane, however, we still possess a portion of the stalls, which is traced to be of late fifteenth century or sixteenth century, and at Aberdeen and elsewhere, respectively, we have very characteristic pieces in a group of stalls and screen, and a pulpit. The latter had become disarranged and the carved parts scattered among the people. They were, about twenty years ago, collected again, and reconstructed in their original form by the writer. The original pieces were nearly complete.

Such, then, is a sketch of the outstanding distinctive features of Scotland's church architecture after the close of the thirteenth century, a sketch which it has been thought well to comprise the gradually diminishing number of churches erected in the early part of the sixteenth century, prior to the Reformation.

The last of these—a Collegiate church—founded in 1545, and was scarcely begun when the Reformation became a complete tide of church building into channels.

I shall now ask your attention to such alterations as have been brought together of



Crown of King's College Tower, Aberdeen.

ent features referred to in this paper, and you to accept them as indices of much that could be shown did time permit. Such as they are I trust, that in your view of them, I may be permitted to anticipate that you will, as I have done, recognise in its works, Scotland has sustained the characteristic of sturdy independence, which expressed sometimes at the expense of grace.

The English work of the same type, busy with many small members in mouldings, vaulted arcades supported on elegant but reduced shafts, does not seem to have appealed to the Scottish mind. The Scotch seem to have preferred the strength and solidity of the earlier works, continuing the cylindrical polygonal shafts in arcades, even to a very period; and in nearly every case they have exhibited a mastery of the art of masonry construction quite commendable. It must be realised that Scotland laboured under very real disadvantages from its prolonged internal disturbances. These severed her continuity of study and culture, yet her work bears the impress of a vigorous effort having been

made to regain her place in the art of church architecture.

I do further anticipate that her works may be judged as exhibiting an absence of the refinement shown in the works of her southern neighbours, but it must be remembered that in England and France political conditions were more favourable to an unbroken development of art. Where work of any magnitude had to be done in Scotland, however, the results (such as at Melrose) show that the intelligence and ability to adapt appropriately and skilfully available architectural details, and at the same time to give the impress of an independent mind upon them, had not entirely died out.

Mr. J. M. Brydon, in proposing a vote of thanks to the lecturer, said that they had had one of the most interesting papers on architecture that had been read for many years either before that Association or the Institute. The lecturer came before them as a thoroughly representative Scottish architect; he was a representative of the Royal Scottish Academy and a past President of the Edinburgh Archi-

tectural Association—the most influential architectural society out of London, because it embraced not only architects but painters and sculptors on the same footing as its ordinary members; consequently the breadth of view of that Association was not quite so narrow as it often was in an association which was strictly professional, like the London Association, or the Royal Institute of British Architects. The time was too late to attempt to go over the whole ground that Mr. Blanc had dealt with, but he, the speaker, felt that every one would be struck at once with the essentially national character of the architectural work of Scotland. It had that sturdy independence which had been spoken of and which was said to be characteristic of the people north of the Tweed. Another point was as to the strong French leaning which was everywhere apparent throughout the architectural work in Scotland, and especially the later work. This was easily accounted for as, after the architectural work in England and Scotland ran neck and neck, so to speak, there came the hiatus at the end of the thirteenth century, when Scotland went to war with her southern neighbour, and when no architectural work of consequence, and very little evolution, took place in the north, similar to that in the south. When, however, at the end of the wars, the Scotch architects saw what had taken place in England and France, they started on a line of their own, making use of the forms evolved by their neighbours, especially the French, and so evolved what we called Scottish Ecclesiastical work. It must have struck every one that Stirling, with its magnificent East End, and the beautiful crown towers of Aberdeen and Edinburgh, were peculiarly Scottish features, and could never have been done anywhere but in Scotland; and the same remarks applied to the remarkable work of Aberdeen Cathedral. The peculiarly French character of the tracery of the windows—the pear shape and the fleur-de-lys—were almost replicas of the features in the Church of St. Gervais, in Paris. The beautiful work of Melrose must be known to every architect, but in his opinion some of the most picturesque churches, such as St. Monan's and others, rivalled it in vigour of style and beauty of detail. The lecturer, owing to limits of time, had not referred to the rich and beautiful porch groining at Dunfermline Abbey—some of the richest in either England or Scotland.

Mr. R. Phené Spiers, in seconding the vote of thanks, said that he was able to bear testimony to the distinctly national character of the Scottish work, which, in his opinion, was not copied from either English or French work. It was many years since he visited Scotland, but at the time he made a great number of drawings of the abbeys and churches, and he was particularly struck by the simplicity of many of them. In the church at Stirling the upper part of the West Tower was very cleverly set back on arches, and the effect was very picturesque: it was an excellent treatment for a simple church tower. At Melrose the great beauty of the decorative carving charmed him very much, for there was something entirely different from the work both in France and England, and it might be studied with advantage by students. At Roslin, he thought, there must have been some foreign influence, such as Portuguese or Spanish, for there seemed to be something entirely different from other Scottish work. The recessing back of the windows in some of the work which had been illustrated that evening, struck him very forcibly, and the great strength and size of the central mullions gave a decided vigour to the architecture.

Mr. H. Lovegrove having supported the vote of thanks.

Mr. Beresford Pite said they were indebted to any Scottish architect, especially to one of the reputation of Mr. Blanc, who came to London and lectured on the architecture of his country. He thought that there was a want of coherence in the designs of Scottish Mediaeval architects, which was not to be found in English work. In English Decorated churches, if the tracery were taken out of the windows, it was still apparent that the buildings were Decorated; but take out the tracery from the Scotch churches, and one was in doubt whether the buildings were Norman, for instance, or even Portuguese or Spanish. He could not help wondering where the Scotch tower crowns came from. It was a beautiful idea, and seemed to be altogether foreign to the national character at the time the buildings were erected. The lack of humour which Englishmen urged against their Scottish brethren

was evident in Scottish carving, which was "finicking" and hard. At Aberdeen, however, some carver had a free hand, and he lavished some exquisite detail upon the beautiful screens there, and which showed qualities of design and grouping. He asked the lecturer if the hardness and coarseness of some of the Scottish work was due to the material? As, if the material was intractable, it would account for much in the design. He also asked if in every case the solid stone roofs, which were so interesting, had arched construction underneath, irrespective of the vault which was seen from the interior.

Mr. Thomas Arnold said that they had had a most lucid lecture that evening. There was one little point, however, in regard to which he thought the lecturer was not quite correct. The lecturer had stated that building work ceased during the times of the wars between England and Scotland. That was scarcely so, because Elgin in the north was built during that time, and Melrose and other buildings were built during the times of Bruce and his successors.

The Chairman, in putting the vote of thanks to the meeting, said they were much indebted to Mr. Blanc for coming all the way from Scotland and for giving them such an interesting address. It was many years since he had had an opportunity of visiting Scotland, and he remembered that on the occasion of his visit Roslin Chapel was a great puzzle to him, as it was still, and he had hoped that the lecturer would have enlightened him as to the curious character of the detail, and especially of the carving. They had to thank Mr. Blanc, who, he might mention, had been a member of the Architectural Association for many years, for the number and excellence of the illustrations shown by him.

The vote of thanks was then put and carried unanimously.

Mr. Blanc, in reply, said that his difficulty had been to select from some 500 photographs a number that could be shown within the time at his disposal. There were many points in Scottish Ecclesiastical architecture which could have been dealt with, but the subject was really too large, and it would have been better had he limited himself to the work of the fourteenth century alone, but the fifteenth was that which expressed most distinctively the Scottish characteristics. It was quite true that Bruce gave large sums for the building of Melrose, but the money was not applied until long after his death. What remained of the fourteenth century was confined to slight additions to the abbey and cathedrals, but there was no considerable building until the fifteenth century. He would very much like to show Mr. Pitt some buildings in which he would find, not expressions of crude barbarism, but, in most cases, of refinement and poetry. If there were poetry in architecture, as there undoubtedly is, its expression could be found in the works of Scotch architects, and at Melrose were to be seen examples of artistic imagination (and Melrose, it must be remembered, was built at a time when Scotland was in a state of rest), and he thought that what was expressed in that building bore out what he had said about Scotland returning to the purity of her intellectual culture, which had left her at the death of Alexander III. He hoped that that Association would at some time visit Scotland and inspect some of her works of architecture, and he need hardly say that the Edinburgh architects would give a hearty welcome to their London confrères. There was a strong tendency to visit foreign parts, and places near at hand were apt to be neglected. Could not the two Associations exchange visits? He would very much like his hearers to see for themselves some of the work that he had referred to.

The Chairman announced that the next meeting would be held on March 25, when Mr. T. C. Cunningham would read a paper on "Constructional Steel Work."

The meeting then terminated.

A RELIC OF THE TOWN WALLS, NEWCASTLE.—It is stated that in the course of the alterations at present being carried out at the Guildhall, Sandhill, Newcastle, on behalf of the Commercial Exchange Co., there has been discovered what is believed to be a fragment of the old town walls. The alterations in progress at the Guildhall are being carried out in accordance with plans prepared by Messrs. Armstrong and Knowles, architects, at an expenditure of 3,000l.

COMPETITIONS.

WORKHOUSE, WESHAM, KIRKHAM, LANCA-SHIRE.—Mr. Kirby, of Liverpool, assessor for the new Fylde Workhouse plans has made his award as follows: (1) 150l., Messrs. Crickmay & Sons, Westminster-chambers, London; (2) 100l., Messrs. Haywood & Harrison, Accrington and Lytham; (3) 50l., Mr. Morton, South Shields. About twenty architects competed. The estimated cost of the new house is 35,000l., exclusive of land.

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of members of the Northern Architectural Association was held on the 9th inst. at the Art Gallery meeting-room, Grainger-street, Newcastle, Mr. F. W. Rich, President, in the chair. The Chairman expressed regret that the continued indisposition of the Hon. Secretary, Mr. A. B. Plummer, prevented him from being present. The award of the Assessors (Messrs. F. W. Rich and A. M. Dunn) in reference to the drawings sent in by students in competition for the prizes offered by the Association for the best set of drawings for subjects required by the Royal Institute of British Architects, in their Final and Intermediate examinations was opened. Only two sets were sent in. The first prize was awarded to "Grisha"—Mr. Andrew K. Tasker, North Shields; and the second to "Juvenis"—Mr. E. E. Shepherd, Newcastle. The President presented the prizes. The annual report, which was read by the President, recorded the increasing success of the Association. The roll now stood:—Members, 52; associates, 54; and students, 39; total, 145. The report detailed at length the doings of the Association throughout the year, and appended to it were reports of the Students' Sketching Club, and the Librarian, Mr. H. C. Charlewood. The Hon. Treasurer, Mr. J. T. Cackett, presented the accounts, which showed that the year commenced with a balance of 7l. 10s. 7d., and terminated with one of 32l. 10s. 9d. The reports and accounts were adopted, and votes of thanks tendered to the officers of the Association for their services during the past year. All the officers were re-elected as follow:—President, Mr. F. W. Rich; Vice-President, Mr. W. Glover; Hon. Secretary, Mr. A. B. Plummer; Hon. Treasurer, Mr. J. T. Cackett; Hon. Librarian, Mr. H. C. Charlewood, together with the Council. Mr. Rich and Mr. Glover were both nominated for the Presidency, the former receiving 13 votes and the latter 12.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Edinburgh Architectural Association met on the 9th inst. in the Royal Institution, Mr. Thomas Ross, President, in the chair. Mr. A. Hunter Crawford delivered a lecture on "Steam Heating and Domestic Hot Water Supply," illustrating his remarks by a plan, sketches, and a working model. The application of steam for domestic heating, cooking, and hot water supply from one boiler was described, and the advantages and disadvantages of steam as a heating medium discussed, the lecturer expressing considerable doubt as to the advisableness of its introduction into this country to the same extent as employed in America, where the climatic conditions were so different. The flow of hot water in pipes was then described and the results of the experiments on the model given.—On the 12th inst. the members visited Leith Academy, Leith Links, which has just been erected by Leith School Board. Mr. George Craig, architect of the school, acted as leader. The company visited the infant class-rooms, juvenile class-rooms, art rooms, lecture hall, chemical laboratories, physical and technical laboratories, and other rooms for a science college, cookery and sewing rooms. The school has accommodation for 2,097 pupils, and was built at a cost of about 30,000l. The building at its basement is 122ft. long, and the height of the structure from the pavement to the top of the centre tower is 123ft. The style is Renaissance, with a centre wing and two side wings. The centre wing is one story higher than the rest of the school, and on the top of this story is a Mansard roof, surmounted with a large fliche to be used as an outlet in connexion with the ventilation. The towers surmounting the other two wings are also to be used for ventilation. The heating and ventilation, which is on the plenum system, has been put in by Mr. Key, Glasgow. Mr. Key

explained his system to the company. The members afterwards visited some of the few remaining buildings of historical interest in Leith, under the leadership of Mr. John Watson architect. The town house of the Balmerino family, situated in a close off the Kirkgate, was first visited, then a mansion-house in Quality street; also the Old Custom House, dated 1727 on the Shore, and St. Ninian's Manse.

ARCHÆOLOGICAL SOCIETIES.

SURREY ARCHÆOLOGICAL SOCIETY.—The forty-third annual meeting of this Society was held on the 9th inst., at the offices of the Society, 8, Dances' Inn, Strand, when Viscount Middleton, President, occupied the chair. The President moved the adoption of the report of the Council and annual statement of accounts. The part of the Society's Collections (vol. 1, part 2) for the year 1897 was duly issued to all members not in arrears with their subscriptions. In this part are valuable papers by Mr. J. Ridley Bax, Mr. Ralph Nevill, and the late Mr. William Young. The catalogue of church plate is still being continued by the Rev. T. Cooper, and the extracts from Surrey wills by Mr. F. A. Crisp. Suitable premises having been placed at the disposal of the Society by the Mayor and Corporation of Guildford, the Council is now able to carry out the resolution of the general meeting authorising the removal from London to Guildford of the headquarters of the Society. The new premises, which at the old houses adjoining the Castle Arch and Quarry-street, and form part of the Castle Precinct, will permit the suitable housing of the museum collection, and by affording greater space render the Society's valuable library more readily available to members. The Council hopes, now that the Society is to have its home in Surrey, that the interest taken in it by residents in the county will be greatly increased, and thus bring about a large accession of new members. To meet the expenses of the removal, and to carry out the internal arrangements necessary for fitting up the new premises as a museum and library, it is estimated that a sum of 300l. will be required. Towards this sum an appeal recently issued, about 200l. has already been subscribed or promised. Mr. J. Jackson Howard and Mr. J. Oldrid Scott have resigned their seats on the Council. Dr. J. Dashwood Howard and Mr. Edmond Foster have been duly elected to fill the vacancies. The vacancy caused by the resignation of Mr. Mill Stephenson, one of the Honorary Secretaries, was filled by the election in April of Mr. Montague S. Giuseppe to act as Honorary Secretary in conjunction with the Rev. T. Cooper. The number of members is 292, viz., annual, 200; life, 91; honorary, 1. During the year 16 new members have been elected, viz., 15 annual and 1 life. By death the Society has lost 7 members, viz., 3 annual, 3 life, and 1 honorary; by resignation 1 member. Lord Ashcombe seconded the adoption of the report, and the motion was carried unanimously. Sir William Vincent moved, and Mr. Rice seconded, the re-election of the retiring members of the Council, viz., Colonel John Davis, and Messrs. F. A. Crisp, J. F. Eastwood, E. Freshfield, G. Martineau, W. More-Molyneux, and Ralph Nevill. This resolution was adopted, and the Honorary Secretaries and the auditor (Messrs. C. T. Davis and W. F. Potter) were re-elected. The Honorary Secretary (Mr. Giuseppe) read a letter from Mr. W. P. Ivatts (the Collector) resigning his office. Mr. Ralph Nevill said Mr. Ivatts had been connected with the Society for forty-four years, and had been a most useful servant. He moved a vote of thanks to him for his faithful services. This was agreed to and on the proposition of Mr. S. W. Ker shaw, it was resolved to present Mr. Ivatts with an honorarium of 5l. 5s. Votes of thanks to the several officers and the President closed the proceedings.

NEW SCHOOLS, GOWERTON, GLAMORGANSHIRE.—On the 5th inst. the twelfth county school erected under the Intermediate Technical Education Acts was opened at Gowerton. The new school cost between 4,500l. and 5,000l., and will afford accommodation for 120 students. Designed by Mr. T. P. Martin Swanes, they have been erected by Messrs. Bennett Bros., Swanes, under the supervision of Mr. R. S. Griffiths, Tonymandy Consulting Architect of the Technical Committee of the Glamorgan County Council.



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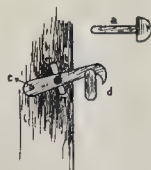
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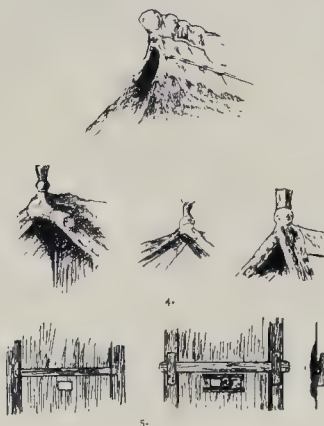
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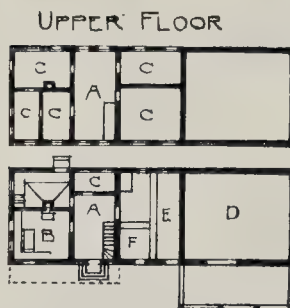
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6.



UPPER FLOOR.

GROVND FLOOR.

REFERENCES TO PLAN.
A. Central Hall and Staircase. D. Barn.
B. Living Room. E. Stall for Cows.
C. Bedrooms, &c. F. Stall for Horse.

7.

Illustrations of Cottages in the Black Forest.

1, 2, 3. Exterior Views.

4. Gable Terminations.

5, 6. Door Fastenings, &c.

7. Plans of a Cottage.

OTTAGES IN THE BLACK FOREST.

The publication issued under this title* is really a historical description of the plan, and construction of the old cottages in the Black Forest. The publication is in book form of a large folio size, and comprises six pages of text with no less than 108 illustrations and five special plates. It appears to be reprinted, however, to a great extent at all, from the *Zeitschrift für Bauwesen* of 1885, and we believe most of the diagrams were originally in that journal. The author is Professor B. Kossmann, an architect of considerable reputation in South Germany, and a well-known authority on archaeological matters.

The publication itself must be regarded rather of archaeological than architectural interest; as for practical purposes little is to be gleaned from its pages, even for those who are timber or half-timber work in designing their cottages or bungalows. As an archaeological and historical publication, both the text and the illustrations are of considerable value, and fill an important gap; for, whilst little has been published on Swiss cottage architecture, little of importance has appeared on the cottages of the Black Forest for a very considerable time. As far back as 1853 and there were some publications on the subject by Messrs. Eisenlohr and Geire respectively, the titles of whose works were "Hölzernen Häuser im Schwarzwald" and "Holzgebäude in Süddeutschland." Eisenlohr's publication was, however, the only one with sufficiently reliable measured drawings and critical facts. No doubt some small con-

tributions to current literature have been made from time to time on this and kindred subjects, but it is the first time since 1853 that there has been an attempt to treat the matter comprehensively.

It is not our intention to enter into detail as to the origin and development of the cottage of the Black Forest, as described by Herr Kossmann, for we do not hold that the subject is of any considerable importance in this country, and the mere reference to the publication, and a record of its value will suffice to call the attention to the work of those few archaeologists who are specially interested, and to those tourists and *habitués* of the Black Forest who might care to study the subject. The work has been most systematically compiled, and we are particularly pleased to observe that the author has not omitted to call attention to the various fittings, such as door furniture, &c., in use in the cottages and without, nor to such details as the "finials" and the thatched roof. We take the opportunity of reproducing some of Herr Kossmann's illustrations, showing the general effect of a cottage in the Black Forest, and it will be observed how much more sombre and heavy in effect these cottages are as compared with the light cottages of Switzerland, with their many galleries and fretwork. Two plans which we show are typical of the general arrangements of the cottage in the Black Forest, whilst the details of door-fastenings, latches, &c., are of much interest.

We may congratulate Professor Kossmann on the careful manner in which he has prepared this work, which, though by no means a large one, is exceedingly comprehensive, and is written in a brief and concentrated style unfortunately rare in German books.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

BATHS AND WASHHOUSES, NEW CROSS.

ON the 12th inst. the third Spring Visit of the Architectural Association took place, to the new baths and washhouses at New Cross, which are to be opened next month.

The members met in the board-room of the building, where Mr. W. T. Norman Dinwiddy, son of the architect, explained the general scheme and construction, illustrated by the working drawings, which were exhibited.

Members were then shown through the various departments, of which a short description appeared in our issue of February 5. Steam having been generated, the well machinery was seen in working order, and delivering water to the swimming baths, the larger of which, having a capacity of 120,000 gallons, can, with the aid of a large storage tank, be filled in the space of an hour and three-quarters. The yield of the well, which is 250 ft. deep, is 600 gallons per minute.

It is not always possible for a large public swimming-bath to be lighted, except from the top, but in the present instance windows on one side over the gallery of the first-class bath give it a light and cheerful aspect. In most public institutions economy with regard to the working staff is essential, and for this reason the entrance to all departments is supervised from one pay-box only; but we think it would have been advisable to have given the public laundry a separate entrance.

The architectural treatment of the interior of a bath, especially in connexion with the colour decoration, is a debated question. White glazed bricks predominate in the New Cross Baths, with the mouldings and features in

* Die Bauernhäuser im Badischen Schwarzwald." By B. Kossmann. Berlin: Ernst & Sohn.

glazed bricks of a blue colour. We still think there is something to be desired in this direction, but manufacturers of glazed ware seem to meet with difficulties in firing colours suited to our present needs.

DRAWINGS FOR THE ROYAL ACADEMY.

As usual, we shall be glad to receive and deliver at the Royal Academy all drawings intended for the Architectural Room which are sent to us in time to be photographed for publication before sending in.

The last day for receiving drawings at the Academy is Monday, March 28, and we can receive none at this office later than 12 noon on Saturday, March 26.

Every drawing must have two labels giving the title of the work and the name and address of the author, one affixed to the back of the drawing, and the other attached by a string so as to hang over in front of the drawing, and must be accompanied by a letter to the Secretary of the Royal Academy, giving also the title of the work and the name and address of the author. If more works than one are sent they must be numbered, and referred to by the corresponding numbers in the letter to the Secretary.

Gift frames only are admissible at the Royal Academy.

We cannot provide labels for drawings which are sent without them.

Illustrations.

CHRIST'S HOSPITAL: THE SCHOOL QUADRANGLE.

THIS view represents the southern end of the large quadrangle, with the school hall in the centre, and class-rooms on either side, the science and art schools being on the east side of the quadrangle.

The drawing was made some little time ago, but the buildings now being erected differ very little from the original Competition design.

The works are in active progress. The builders are Messrs. Longley & Son, of Crawley; and the architects, we need hardly remind our readers, are Messrs. Aston Webb and Ingress Bell.

EXAMPLES OF RENAISSANCE DOOR-KNOCKERS.

THESE illustrations of door-knockers from various Renaissance palaces in Italy are reproduced from a set of beautiful pencil drawings by Herr Lippitsch, architect, of Vienna. Whether they are all to be recommended as studies in design is a question; to our thinking they all have the defect which we find in the majority of designs for door-knockers, ancient and modern, viz.: a want of suitable design in the knocking portion, which ought to have a special suitability for hammering. Only one of these designs, that from the Arnoldo-Veli Palace at Bologna, has the knocking portion suitable in shape for knocking, and even that is unsuitable in treatment, since it represents a bunch of grapes between leaves, which is not a kind of instrument one would knock at a door with.

The designs, however, are very interesting as examples of Renaissance taste and fancy, and as we have been hearing a good deal about Renaissance art lately, their publication seems to come in suitably at the present moment.

ELEVATIONS AND PLANS OF SCOTTISH CHURCHES.

THE drawings given in these two sheets are in reality a portion of the diagrams used by Mr. Blanc for the illustration of his paper on "Scottish Ecclesiastical Architecture," read at the Architectural Association, and printed on another page; and they must be taken in connexion with it.

Some others of the diagrams are printed along with the report of the paper.

HOME ARTS AND INDUSTRIES ASSOCIATION.—The fourteenth annual exhibition of the Home Arts and Industries Association will be held on May 19 to 23, at the Royal Albert Hall, and will include exhibits from Sandringham, Ashridge, Keswick, &c. Competitions and demonstrations in various subjects will be held during each afternoon.

THE LONDON COUNTY COUNCIL.

THE first meeting of the fourth London County Council was held on Tuesday at Spring-gardens, Dr. Collins, Chairman of the late Council, presiding.

Election of Chairmen.—Mr. McKinnon Wood, the former leader of the Progressive Party, was unanimously elected Chairman, a motion put forward by two Moderate members proposing Mr. John Burns, M.P., for the post having been withdrawn. Lord Welby, a Progressive, was elected Vice-Chairman, and Mr. H. P. Harris, the former Moderate whip, deputy Chairman. The ballot for the election of ten aldermen to serve for the next six years resulted as follows:—H. Gosling, G. Dew, A. Hoare, Dr. Blake, Rev. F. Williams, Lord Tweedmouth, Sir A. Arnold, Earl Russell, J. A. Baines, and R. C. Antrobus. Two other aldermen—Lord Farrer and Sir Godfrey Lushington—resigned.

The Crystal Palace.—The Council afterwards proceeded with the reports of the committees from the former Council. The General Purposes Committee recommended the Council not to appoint delegates to attend the conference to be held at the Mansion House on the question of the acquisition of the Crystal Palace.

Mr. Strong moved as an amendment that the Chairman and Vice-Chairman of the General Purposes Committee should attend the conference.

On a division the amendment was lost by sixty-four votes to fifty-seven, and the recommendation was accepted.

The Planting of Hampstead Heath.—On the Report of the Parks Committee on the objections which had been taken by local residents to the action of the Council's officers in planting a number of trees on Hampstead Heath, near Willow-road and Spaniards'-road, the Committee stating that the planting was necessary for the preservation of the Heath, it was moved that the views of the Committee should be confirmed.

Mr. E. Bond, M.P., moved that, in the opinion of the Council, it was desirable that the trees should be removed; and that the Parks Committee should be requested to report further as to the reasons which rendered it, in their judgment, inadvisable to comply with the wishes of the Hampstead Heath Protection Society. He pointed out that when this thoroughly inappropriate row of trees reached maturity, they would deprive visitors to the Heath of one of the most charming of walks.

Mr. Dickinson seconded the amendment.

Mr. Fletcher held that the trees were of advantage to the Heath.

At the suggestion of Mr. Costelloe, the report was referred back.

A Gift of Land.—The Parks Committee informed the Council that an offer had been made by the Earl of Northbrook and Viscount Baring to present to the public, in commemoration of the Diamond Jubilee of the Queen, a piece of land nearly seven acres in extent in Bromley-road, Lee, for the purpose of a recreation ground. The only conditions attached to the gift were that the ground should be taken over by the Council and laid out and properly maintained by it as a recreation ground, and that the costs of Lord Northbrook's solicitor and surveyor should be borne by the Council. Building operations were going on in the district and there was a Board School close by. Under the circumstances, they did not hesitate to suggest that the Council should undertake the charge of the land on behalf of the public. They recommended:—"That the Council do agree to take charge of and maintain as a recreation ground the piece of land at Bromley-road, Lee, offered by Lord Northbrook and Lord Baring, and do undertake to pay the costs of Lord Northbrook's solicitor and surveyor in connexion with the matter; that it be referred to the solicitor to take all steps necessary to complete the matter; and that Mr. Kemp be informed of the course proposed to be taken." The recommendation was adopted.

Street Widening, Limehouse.—On the recommendation of the Improvements Committee, it was agreed that the estimate of 1,250l. submitted by the Finance Committee be approved, and that the Council do contribute, on the usual conditions, one half of the net cost of the widening of Three Colt-street, at Nos. 60, 62, and 64, as shown upon the plan submitted by the Limehouse District Board, such contribution not to exceed the sum of 1,250l.

The Council adjourned soon after six o'clock.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Line of Frontage.

Kensington, South.—Buildings, with one-story shops in front, on the south side of Old Brompton road, between No. 38, Sussex-place, and No. 39, Summer-place (Mr. W. H. Colbran).—Consent.

Marylebone, West.—An enclosed porch in front of No. 49, Grove End-road, St. John's Wood (Mr. T. H. Watson for Mr. W. Ross).—Consent.

Paddington, North.—A theatre on the site of Nos. 213, 214, 215, 216, 218, and 220, Harrow-road, but also upon Westbury-road and Ranelagh-road (Mr. F. Matcham for Mr. R. Arthur).—Consent.

St. George, Hanover-square.—The enclosure of the front of the portico at No. 11, Charles-street, Berkeley-square (Messrs. Ernest George and Yeats).—Consent.

Wandsworth.—A timber-rack erected in front of Warwick House, The Broadway, Lower Tooting, and a timber-stage in the garden at the rear of those premises (Messrs. J. Spanton & Co.).—Consent.

Chelsea.—Buildings on the south-west side of Park-walk between Chapel-street and Winterton place, and the enclosure of that place and a portion of Park-walk (Messrs. Wimpey & Arber for Mr. R. C. H. Sloane Stanley).—Consent.

Deptford.—Stone pilasters erected to the shelter front of No. 489, New Cross-road (Messrs. Arduin & Dawson for Mr. A. Lewis).—Consent.

Fulham.—A porch and two four-story bay windows in front of a block of residential flats on the north side of Lillie-road, at the corner of Humbolt-road (Mr. M. J. Allen).—Consent.

Hammersmith.—One-story shops to Nos. 278 and 280, Uxbridge-road (Mr. J. H. Richardson for Mr. W. A. Cubitt and Mrs. Haslip).—Consent.

Islington, North.—Four-story bay windows proposed residential flats on the south side of Penberton-gardens, St. John's Park, Upper Holloway (Mr. S. Perks for the Tufnell and Caledonian Park Syndicate).—Consent.

Paddington, North.—A church on the west side of Saltram-crescent, St. Peter's Park, with two projecting porches to abut upon Croyley-road (Mr. J. Alder for the Vicar-elect and Building Committee of St. Simon's Church).—Consent.

Peckham.—A one-story addition at the rear of "Reindeer Tavern," No. 151, Rye-lane, to abut upon Bournemouth-road (Mr. G. Hubbard for Mr. A. Laing).—Consent.

Strand.—Two iron signs and lamps at the entrance to the New Gallery, No. 121A, Regent-street (Mr. E. R. Robson for the directors of the gallery).—Consent.

Wandsworth (detached).—Ten three-story houses with projecting bay-windows on the north side of Thurlow Park-road, West Norwood (Mr. E. Sadgrove for the Dulwich Estate, Limited).—Consent.

Fulham.—A greenhouse on the forecourt of No. 87, Fulham Palace-road (Messrs. Simmonds & Co. Limited).—Refused.

Brixton.—Two one-story bay windows in front of No. 104, Stockwell Park-road (Mr. W. E. Davis for Mr. J. Crump).—Refused.

Hackney, Central.—Two blocks of residential flats on the west side of Lower Clapton-road between Holly Lodge and Maitland House (Mr. J. Bedborough for Mr. W. Andrews).—Refused.

Kensington, South.—Two one-story bay windows in front of No. 16, Campden House-road to abut upon Campden-grove (Mr. W. Watson for Mr. M. Levy).—Refused.

Lewisham.—One-story shops in front of buildings recently erected on the west side of Bromley-road with the flank of the southernmost shop to abut upon Aitken-road (Mr. G. Tolley for Mr. J. Watts).—Refused.

Marylebone, West.—Balconies at the first, second, third, fourth, and fifth floors, in front of a block of residential flats known as Abbey-court, on the site of No. 47, Abbey-road, St. John's Wood (Messrs. Metcalf & Greig).—Refused.

Paddington, South.—Buildings upon the site of Nos. 5A and Nos. 6 to 21, inclusive, Moscov-road (Mr. A. M. Ridge for Mr. W. Whiteley).—Refused.

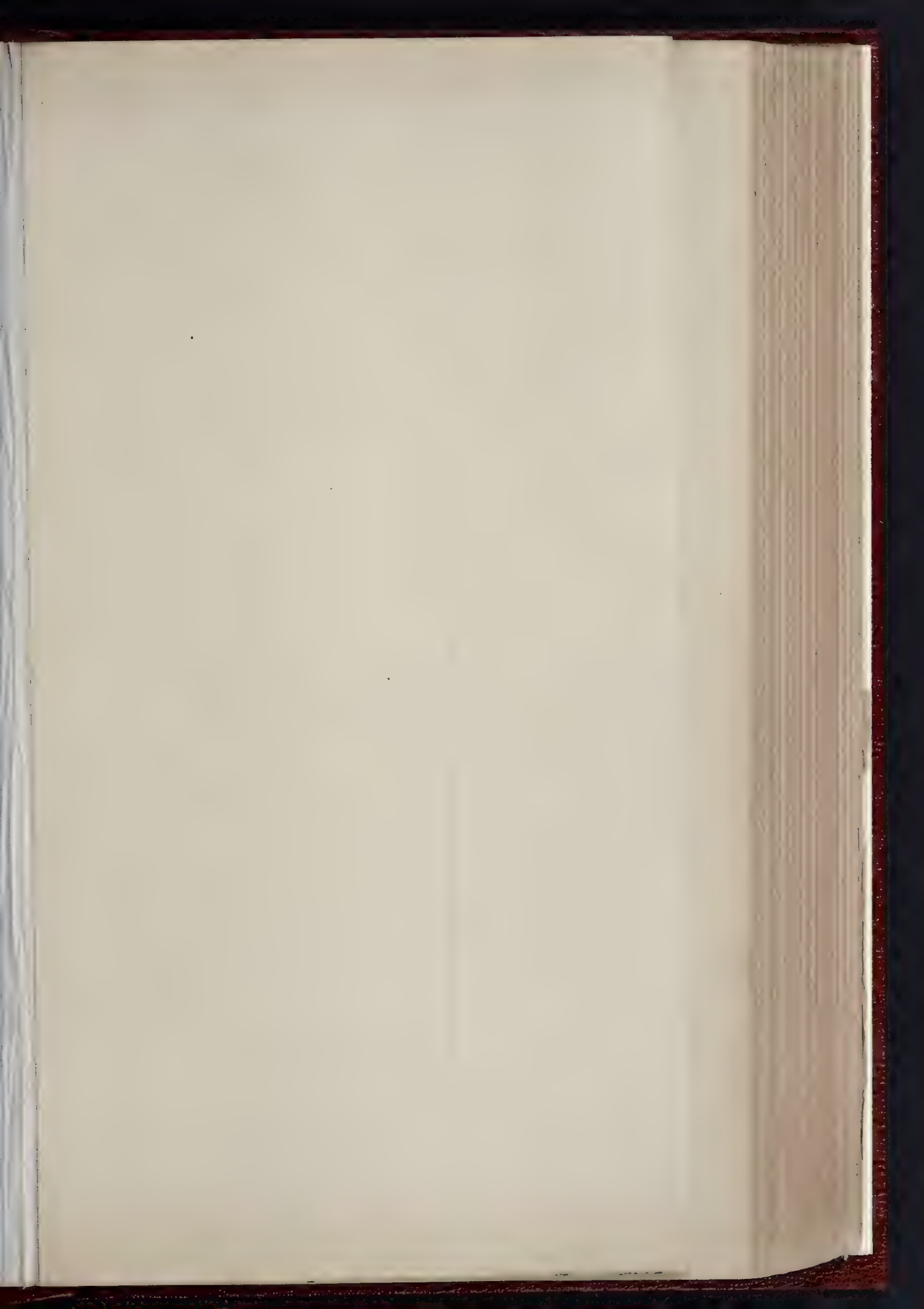
Width of Way.

Whitechapel.—Rebuilding of Nos. 7 and 8, Grace alley, Wellclose-square, at less than the prescribed distance from the centre of the road (Mr. S. Cranfield for Mr. W. E. Cranfield).—Consent.

Lewisham.—An addition at the rear of No. 10, London-road, Forest Hill, to abut upon Havelock street at less than the prescribed distance from the centre of that street (Mr. J. R. Vining for Messrs. Mayo & Co.).—Consent.

Newington, West.—Seventeen houses on the south side of Hillingdon-street, between Nos. 133 and Roy-

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.





W. G. Mason 1874

THE NEW CHRIST'S HOSPITAL SCHOOLS —
VIEW IN THE GROUNDS

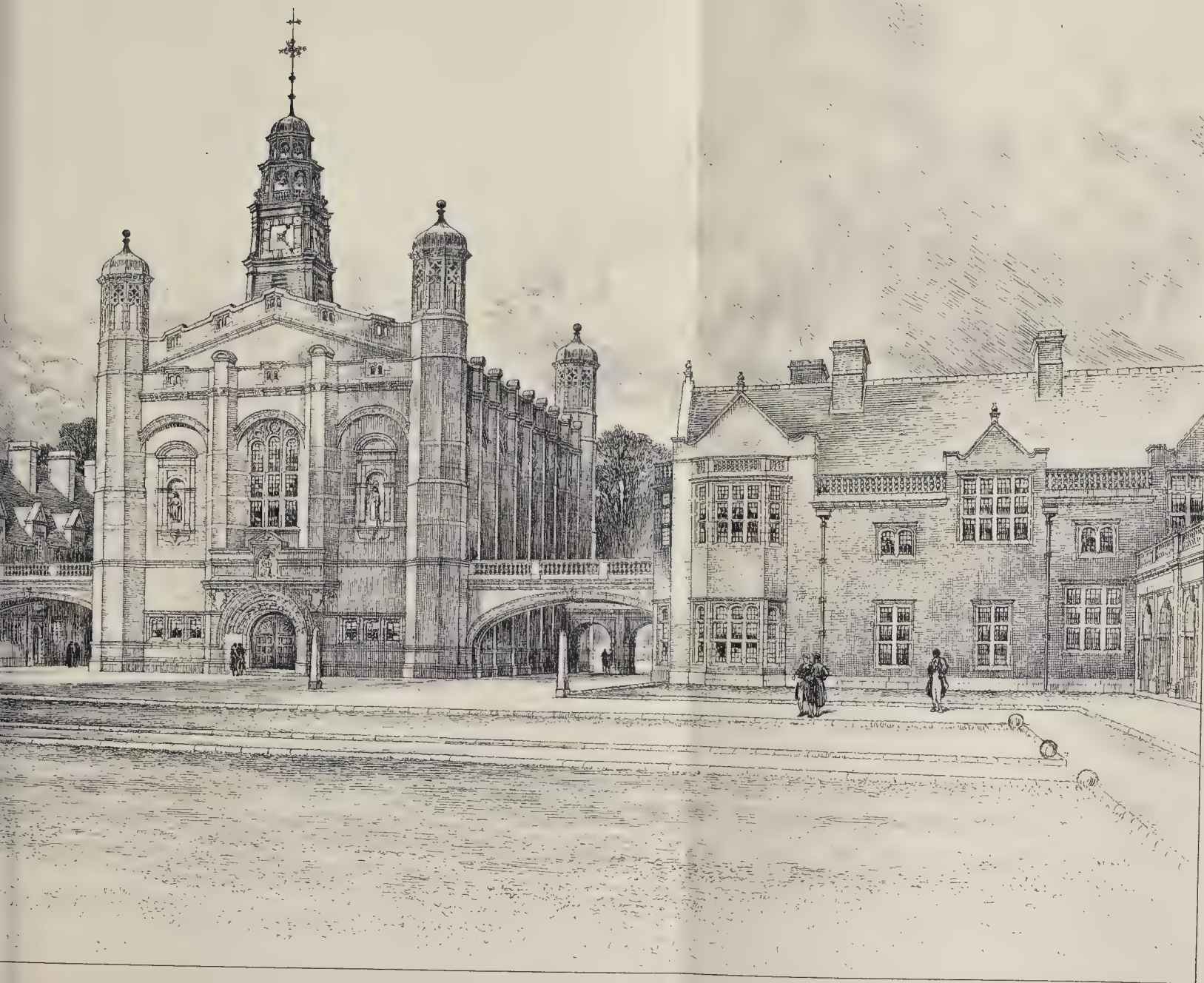
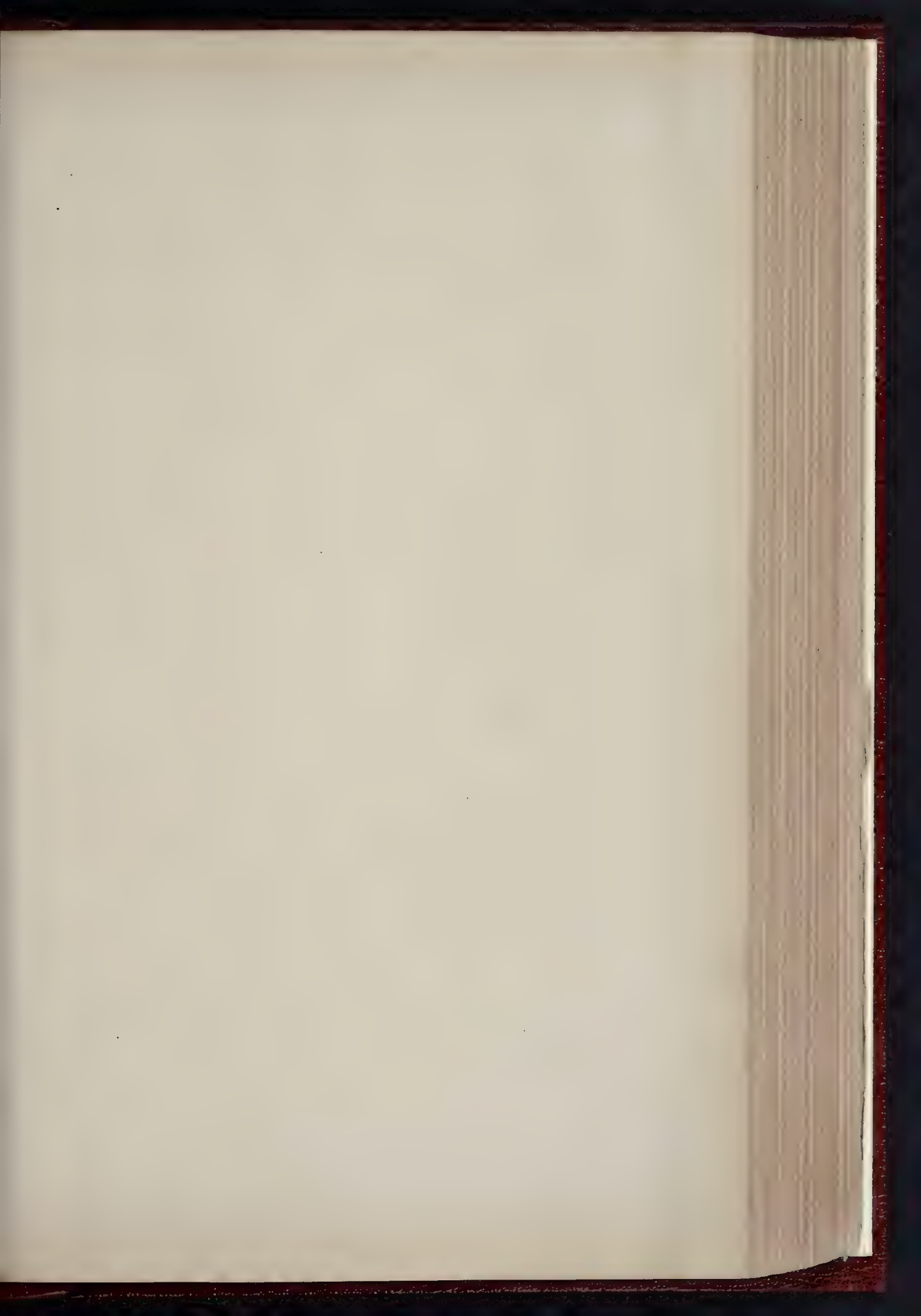


PHOTO LITHO SPRAGUE & CO. 485 EAST HANCOCK STREET FLETCHER LANE, E.C.

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FROM GRIMANI PALACE, VENICE



FROM A HOUSE IN VICENZA.



FROM PALAZZO RIZZOLI, BOLOGNA.



FROM HOUSE OF ARIOSTO FERRARA, (ABOUT 1528).



FROM A HOUSE IN TREVISO.



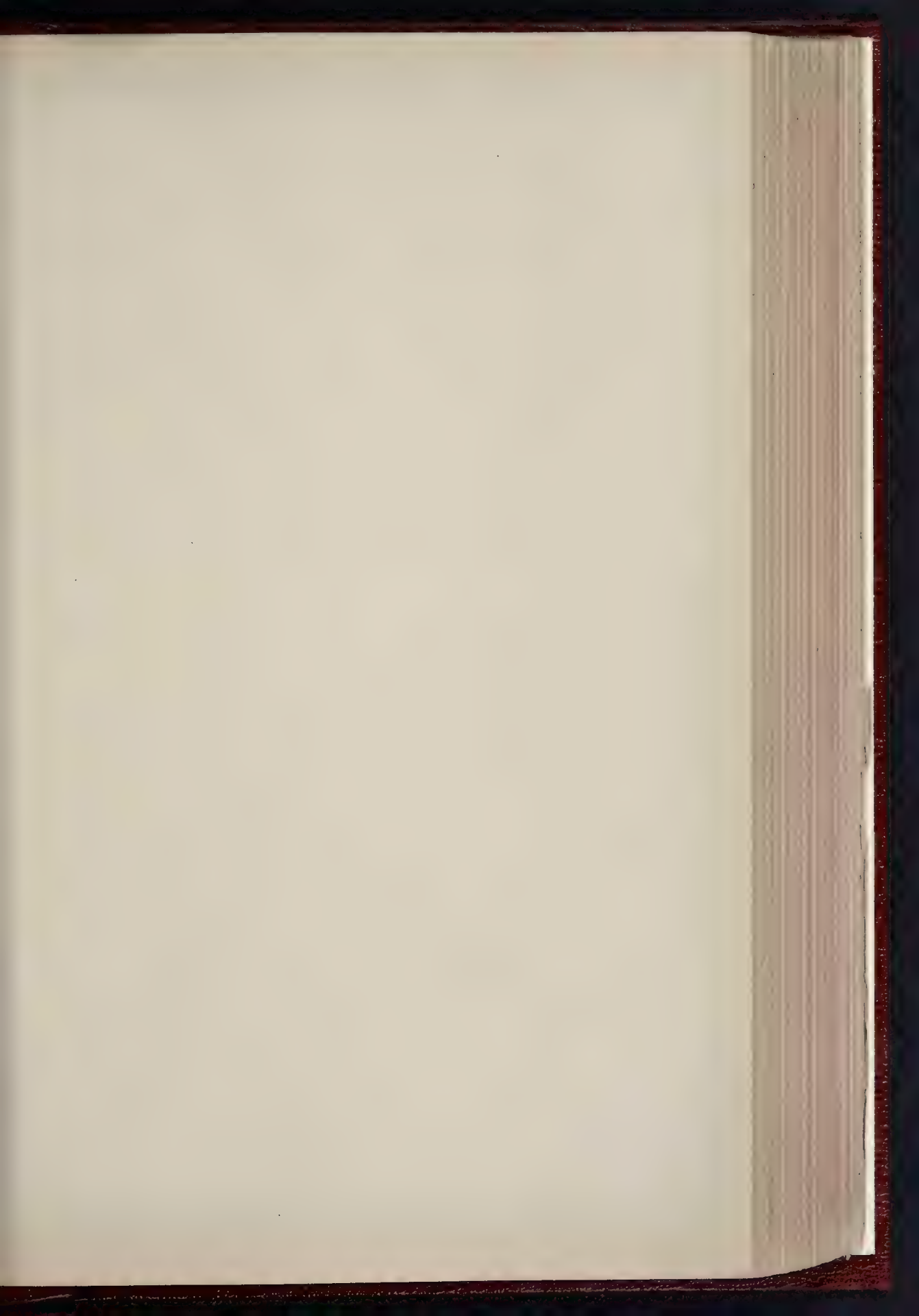
FROM PALAZZO ARNOLDO-VELI, BOLOGNA.



FROM A HOUSE IN REGGIO.



FROM FERRARA.



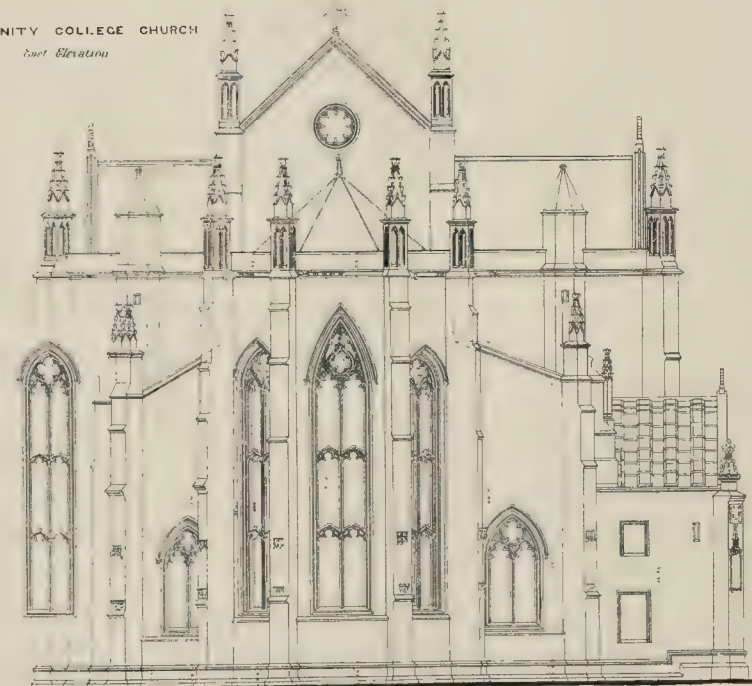
OLD MACHAR CATHEDRAL
ABERDEEN



South Elevation.

Scale of Feet 0 10 20 30 40 50 60 70 80 90 100

TRINITY COLLEGE CHURCH
East Elevation



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South Elevation.



West Elevation



East Elevation



North Elevation

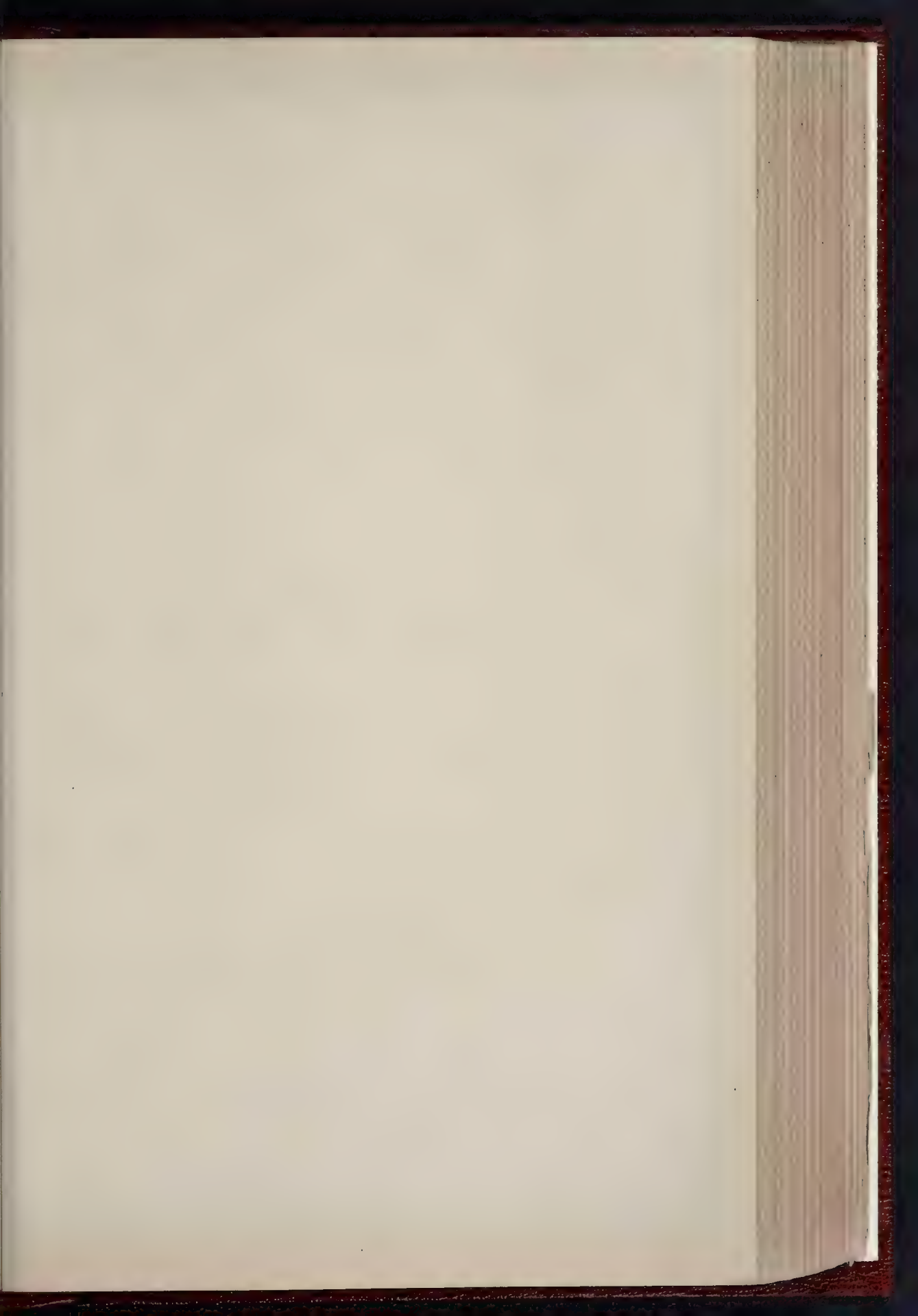


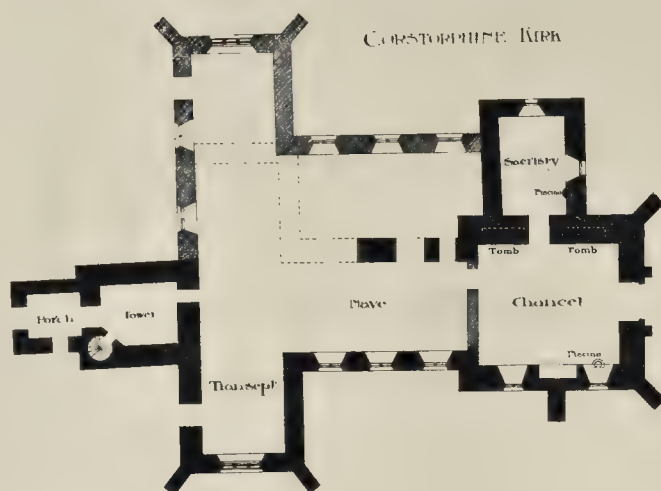
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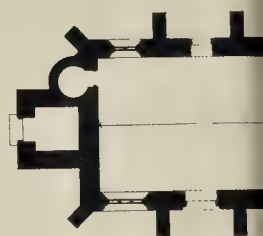
TRINITY COLLEGE CHURCH
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PHOTO-LITHO SPRAGUE & CO. 4 & 5 EAST HARD NO. STREET PETER LANE F.C.

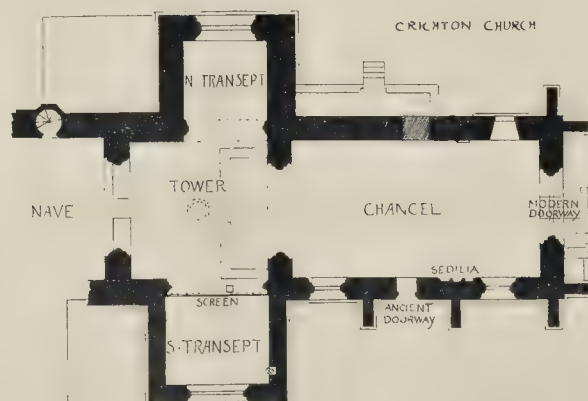
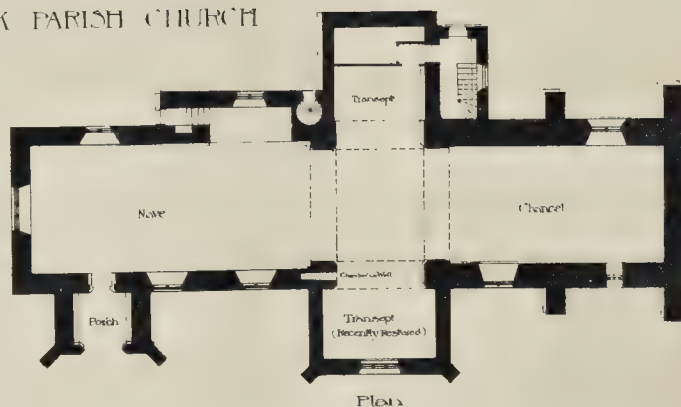




LADYKIRK CHAPEL



WHITEKIRK PARISH CHURCH



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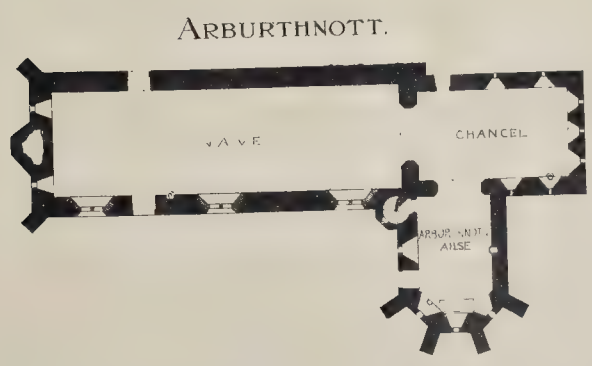
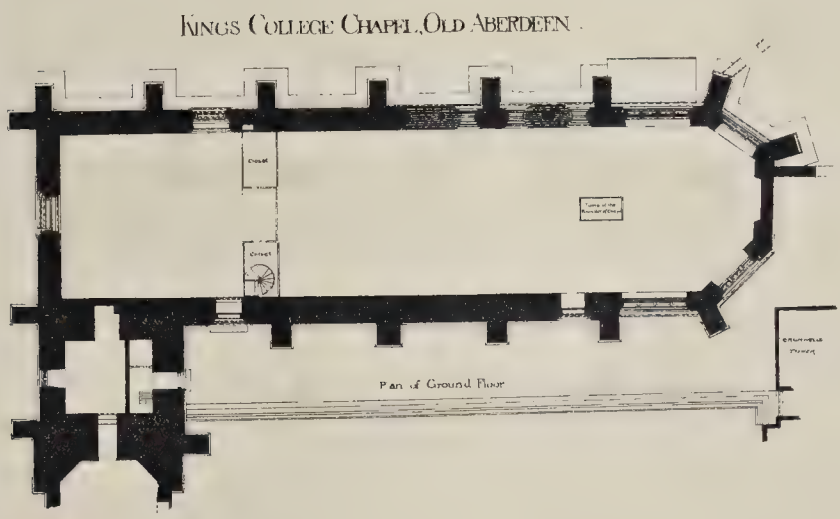
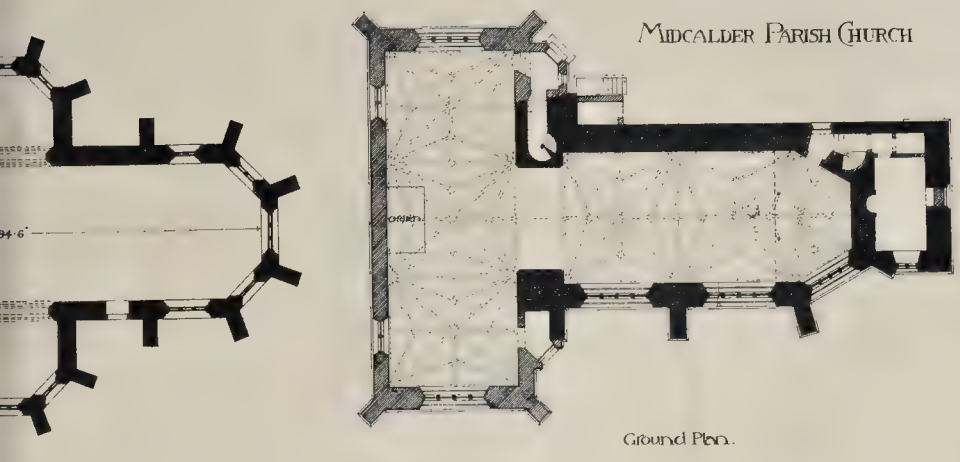


PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET KETTER LANE, E

ad, Walworth (Mr. J. Warne for Mr. J. H. Billing-
—Consent.

Poplar.—A church and a chaplain's house on the
east side of Hale-street, East India Dock-road (for
Messrs. A. W. Blomfield & Sons, for the Mission to
Women).—Consent.

Westminster.—That Mr. J. D. Butler be informed
that his letter on behalf of the Receiver for the
Metropolitan Police District, asking the Council to
sanction the erection of a proposed police-station on
the site of the Civil Service Commission premises,
having been considered, the Council has no objection
to offer to the erection of the new building in the
position proposed.—Agreed.

Dulwich.—That Mr. R. Pearson be informed that
his application for the consent of the Council to the
erection of two two-story houses on the south side
of Boxall-row, High-street, having been further con-
sidered, the Council sees no reason to depart from
its decision of November 30 last not to grant the
application.—Agreed.

Kensington, South.—Studios on the south side of
trafford-road, to exceed in height the width of
ladley-mews (Mr. C. R. G. Hall).—Refused.

Line of Fronts and Width of Way.

Deptford.—A two-story addition at the rear of
Nos. 199 and 201, Lewisham High-road, to abut
upon Lucas-street (Mr. T. J. Downes for Messrs.
Haycroft & Son, Limited).—Consent.

Southwark, West.—An addition to a one-story
actory, about to be rebuilt to a height of 15 ft., on
the west side of Harrow-street, St. George-the-
Martyr (Messrs. T. Rider & Son for Messrs.
Hayline Bros.).—Consent.

Fulham.—A store-room at the rear of No. 672,
Fulham-road, to abut upon Rostrevor-road and a
passage leading to Rostrevor-mews (Mr. G. De
Wilde for Mr. D. Thomson).—Refused.

Peckham.—One-story shops in front of Nos. 571
and 573, Old Kent-road, Camberwell (Mr. E. J.
Stevens for M. T. Wade).—Refused.

Line of Front, Width of Way, and Space at Rear.

Southwark, West.—That the Council, in the exer-
cise of its powers under Sections 13 and 22 of the
London Building Act, 1894, do not consent to the
position and frontage of a two-story house with shop
on the south side of Webber-street, and do not
under Sections 13, 22, and 41 of the Act, consent to
or allow of the erection of thirteen three-story
houses, adapted to be inhabited by persons of the
working class, on the west side of Webber-row, St.
George-the-Martyr, on the site of Nos. 7 to 21,
Webber-row, and No. 72, Webber-street, with the
flank of the northern-most building and the fence
or boundary in front of such houses at less than the
prescribed distance from the centre of Webber-row
and Webber-street respectively, and with an open
space, not in accordance with the rules of the Act,
at the rear of four of the houses in the row (Messrs.
F. S. Brereton & Son for the trustees of Marshall's
Charity).—Agreed.

Bethnal Green, South-West.—That no order be
made with respect to the application of Mr. C. R.
Peters for consent and permission, under sections
13 and 22 and Part V, of the London Building Act,
1894, to erect buildings, on part of the Council's
land within the Boundary-street area, on the west
side of Ainsworth-street, adjoining No. 65, Church-
street.—Agreed.

Line of Fronts and Construction of Buildings.

Camberwell, North.—A wood and glass show-case
erected in the forecourt of No. 63, Wells-street (Mr.
G. Swadling).—Refused.

Battersea.—That Mr. W. Morgan be informed, with
reference to his letter, in reply to penal notices
served upon him by the Council with regard to a
wooden structure which had been unlawfully set up
on the forecourt of No. 445, Battersea Park-road,
asking the Council to consent to and grant a licence
in respect of such structure, that the Council is not
prepared to accede to his request.—Agreed.

Deviation from Certified Plans, &c.

Lambeth, North.—Deviations from the plan
certified by the District Surveyor, under Section
13 of the London Building Act, 1894, so far as
relates to the proposed erection of two-story
buildings on the site of No. 58, Belvedere-road, and
premises at the rear (Mr. R. Willey for Mr. B. T.
Chamberlain).—Consent.

Formation of Streets.

Hampstead.—That an order be issued to Mr. W.
Willett, sanctioning the formation or laying out of a
carriageway approach, 20 ft. wide, to four houses on
the south side of Elsworth-road, Avenue-road.—
Agreed.

Paddington, South.—That an order be issued to
Mr. A. M. Ridge, sanctioning the formation or laying
out of a new street for carriage traffic, to lead out
of Moscow-road, and partly upon the site of Salem-
road.—Agreed.

Wandsworth.—That an order be issued to Mr. W.
Rivett-Carnac sanctioning the formation or laying
out for carriage traffic of new streets, to lead out of
Hotham Villas-road and Worpole-road, Putney, the
widening and adaptation for carriage traffic of a
portion of Hotham Villas-road, and the formation
of an extension of that road into Erpingham-road,

and also the widening of portions of Worpole-road.

Greenwich.—Buildings on the eastern side of Park-
wall, Blackheath, and in connection therewith the
widening of that street to 50 ft. (Mr. E. E. White
for Sir H. P. T. Barron, Bart.).—Consent.

Hackney Central.—That an order be issued to Mr.
A. Bedborough, sanctioning the formation or laying
out of a new street for carriage traffic, to lead from
Lower Clapton-road into Clarence-road. That the
name Rowhill-street be approved for the new street.
—Agreed.

Clapham.—That an order be issued to Messrs. H.
Wakeford & Sons, refusing to sanction the forma-
tion or laying out for carriage traffic of new streets,
40 ft. wide, to lead out of the east side of Manor-
street, High-street.—Agreed.

Lewisham.—That Mr. W. H. Collier be informed
that his application for the sanction of the Council
to the formation or laying out, for carriage traffic,
of a new street 40 ft. wide, to lead out of Wearside-
road, Ladywell, having been further considered, the
Council sees no reason to depart from its decision
of February 15, 1898, not to grant the application.—
Agreed.

Strand.—That Mr. F. J. Walker be informed that
his application on behalf of St. James and Pall Mall
Electric Light Company, Limited, for permission to
omit the posts or bars required under the Council's
order of February 9, 1897, to be erected at both
entrances to a passageway, 10 ft. wide, for foot
traffic, to lead from Carnaby-street into Marlborough-
road, St. James, having been considered, the Council
sees no reason to vary the said order.—Agreed.

Cubical Extent.

Lincolshire.—A block of sulphuric acid chambers at
the chemical works, Bow Common-lane, to exceed
in extent 250,000, but not 450,000, cubic feet, and to
be used only for the purposes of the trade of
chemical manufacturers (Messrs. W. Pearce & Sons).
—Consent.

Means of Escape from Top of High Buildings.

Strand.—That the Council, in the exercise of its
powers under Sec. 63 of the London Building Act,
1894, do grant a certificate in respect of the means
of escape in case of fire, proposed to be provided for
the persons dwelling or employed in the two top
floors of Horrex's Hotel, Strand, at the corner of
Norfolk-street (Messrs. White & Co.).—Agreed.

Buildings for the Supply of Electricity and Width of Way.

St. Pancras, West.—That the Council do approve
of the plans submitted with the application of Mr.
S. W. Baynes, on behalf of the Vestry of St. Pan-
cras, for the construction of new buildings and addi-
tions at the Regent's Park electricity generating
station and works; and that the Council do
authorise the erection of such buildings and addi-
tions, and do also consent to the erection of certain
of the buildings at less than the prescribed distance
from the centre of Longford-street, Stanhope-
street.—Agreed.

Height of Building.

City of London.—A building on land next the
Inner Temple Gardens, Victoria Embankment,
Whitefriars, with a portion of the east flank of such
building to exceed in height the width of Temple-
avenue, upon which it will abut (Mr. W. Emerson
for the Employers' Liability Assurance Corpora-
tion, Limited).—Consent.

BOOKS RECEIVED.

LIBRARY ADMINISTRATION.—By John MacFarlane.
(George Allen.)

TRADE CATALOGUES.

MR. HOLLYER sends us his last catalogue of
photographs from the works of eminent artists,
with a considerable number of miniature repro-
ductions of the photographs, showing the sub-
jects. The great majority are from the works of
Mr. Watts, Sir E. Burne-Jones, and Rossetti, but
there are a certain number of other subjects,
some of them from Continental galleries. The
sculpture photographs seem to be confined to
the works of Mr. Harry Bates, whose bas-relief
subjects are certainly peculiarly fitted for suc-
cessful reproduction in photography.

Messrs. Nairn & Co. (Kirkcaldy) send us
samples of their linoleum and cork carpet,
which appears to be of excellent quality, the
cork carpet especially, both for wearing and
for noiseless quality. They send us also an
illustrated catalogue of their "sylvantine,"
which appears from the illustrations to be
a floor-cloth in imitation of parquetry.—
We have received from Mr. A. P. Lundberg, Brad-
bury Electrical Works, London, an illustrated
catalogue of electric light fittings. Some new
patterns are shown of switches and floor, wall
and table connexions, which are suitable for
high voltage supply. They seem excellently
designed, and the prices are moderate. The

double-break "improved pioneer" switch is a
very serviceable one for high voltage wiring
when cost is a consideration. The plans given
of two-way and intermediate wiring will prove
useful to electricians.

Correspondence.

To the Editor of THE BUILDER.

ST. MARTIN'S, WAREHAM.

SIR,—An additional point in favour of a pre-
Conquest origin for the church noticed in Mr.
Lynam's interesting paper in last week's *Builder*
is the thinness of the walls, which vary, taking
one part with another, from a little over to a
little under two feet. This is one of the safest
criteria for distinguishing Saxon work from
Norman; and, when combined, as it is here,
with long and short work in the external quoins,
is enough to outweigh the counter argument
drawn from the comparatively advanced
character of the chancel arch. Heath, Salop,
differs markedly in its thicker walls, and has,
moreover, all round it a series of broad pilasters
or buttresses of shallow projection, quite unlike
the narrow strips of Saxon buildings. Heath
has scalloped caps in the chancel arch and
chevrons in the south door, and, though in
its unrestored condition a most primi-
tive looking little structure, it is quite dis-
tinct in its Norman character. It may be
noted that the soffit shaft in the chancel arch at
Wareham, which looks advanced, is paralleled
by a similar feature in the present tower arch
—formerly a chancel arch—at the church of
Broughton, near Brigg, Lincolnshire, the design
of which is so unlike anything to be seen in
Normandy, and so closely resembles the
undoubtedly Saxon design of Barton-on-
Humber, that a pre-Conquest origin must be
claimed for it.

It is worth pointing out that the dimensions
of the plan at Wareham correspond rather
closely with those of the chapel (not the big
church) at Deerhurst, Gloucestershire, which
measures—nave, 25 ft. 6 in. by 15 ft. 10 in.;
chancel, 14 ft. by 11 ft. 2 in., and has a chancel
arch 6 ft. 6 in. wide, and north and south doors,
which probably also existed at Wareham.

This chapel was dedicated in 1053.
William of Malmesbury says that St. Aldhelm,
early in the eighth century, built a church at
Wareham in Dorset, the roofless walls of which
were still standing in the historian's day. There
is no ground for connecting St. Martin's
with this story, and, indeed, the other church at
Wareham, St. Mary's, has a bit of Saxon detail
preserved in it, so that Wareham must have
had more than one pre-Conquest oratory.

G. BALDWIN BROWN.

IRON MERCHANTS' CHARGES TO BUILDERS.

SIR,—I shall be glad if you can place the follow-
ing before your readers, to get an opinion of what is
the custom of iron merchants in their charges to
builders in reference to structural iron work.

A case has recently come under my notice wherein
iron merchants' charges are considerably more than
the builder gets for the same. And the merchants
maintain it is the custom of the trade.

The following are the particulars:—
Bills of quantities were prepared by the owner's
surveyors for certain structural iron works, to be
delivered in London (which quantities are found to
be correct as to weight of iron work supplied).

The builder obtains quotations from iron mer-
chants, and bases his tender on these prices and the
quantities in the bills supplied by surveyors. He
gets the work and instructs the iron merchants to
get their particulars from the building and the
detail drawings, which they do, and execute the
work.

They then send in invoices far exceeding the
weights in bills of quantities, although admitting
that they have not actually supplied more, except
where they made the top and bottom plates one-
sixth wider than shown in details (which they did at
their own discretion, and without instructions),
with the result that the builder is charged about
one-seventh more weight on the total amount of
wrought iron, and one-eighth more ditto on cast
iron than is actually supplied, and for which he gets
no payment from the owner.

The merchants maintain it is the custom of the
trade to cover the waste in cutting.

If this is so, how can builders provide against it
in preparing their estimates?

Perhaps some of your correspondents will give
their experiences.

SURVEYOR FOR THE BUILDER.

** Slight discrepancies between the quantities

and the charges of the iron merchant are by no means unusual in the case of wrought-iron and steel work, owing to the lengths of joists being sent in "feet" lengths—where there is no necessity for cutting to dead lengths—in lieu of the exact length that would probably be measured by the quantity surveyor. In this case the contractor would be saved the charge for a "cut," which would generally considerably more than pay for the extra length. Anything like 14 per cent., as in this case, we do not think can be maintained.

In the case of the cast-iron work, certainly the charge should only be for the finished weight, as there is no waste.

As the quantities are usually measured net, the only way out of the difficulty beyond the allowance for waste (which has to be allowed for in all the trades) is for the contractor to obtain a price from the iron merchant upon this basis.

We have never heard of such a custom of the trade as that mentioned by our correspondent.—E.D.

THE EXPLOSION AT MESSRS. CRACE & SON'S.

SIR.—May I trespass on your space in order to answer the many inquiries which have resulted from accounts published in the daily Press of the explosion which occurred here on Monday morning?

The gas had escaped during Sunday from a sliding pendant on the first floor, the room being shut up. On Monday morning about nine the caretaker opened the room, and found the strong smell of gas; at the same time, an artist assistant arriving, and noticing the smell in his room on the same landing, came across to find the cause. They first decided that the pendant was the cause, and were about to charge the tube with water, when one of them, by some fatal impulse, struck a match. An explosion so violent followed that it is difficult to understand how either escaped with life. Both men were badly scorched in face and hands, as also was a third man who had just entered the room. I am glad to say that all three are doing well.

The result on the house was disastrous. In the room itself, all the plate glass was blown across the street, doing some damage to houses opposite; the doorway blown to pieces, and the frame forced out of place; the ceiling and floor above set on fire, all the painting scorched, and some good pictures burnt out of recognition.

Yet the clock continued to go, and some china vases on shelves were undisturbed. In the well staircase the top skylight was blown out, as well as other glass above and below, with singular irregularity.

It is only an act of justice to explain that the fire was arrested, and the damage greatly limited, by the prompt and well-trained action of my neighbours. The amateur fire brigade of Messrs. Debenham & Freebody were on the spot and had a hose laid on in three minutes. Mercifully they had the good sense to abstain from using the latter, with its flood of water, but by prompt use of the "Extinctors" on the spot, put out the fire before the arrival of the County Council engine, and saved the untold damage which water would have inflicted—a lesson which I commend to the notice of those who find themselves called on to deal with fire at the outset.

Fortunately, the damage done on the ground floor is trifling, and not such as to interfere with business in any way.—Yours obediently,

J. D. CRACE.

38, Wigmore-street, W.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XII.

WE noted in our last chapter that it is a usual practice, and it is sufficiently correct to assume in dealing with rivetted girders, that the flanges sustain all the horizontal strains and no others, and that the web sustains only the vertical or shearing strains. In working from this assumption we have, therefore, the total of the horizontal compressive or tensile stress in tons in either flange at any point in the span equal to the moment of rupture in foot tons at that point divided by the vertical distance in feet between the centres of gravity of the cross-section of the two flanges at the same point.

The stress in either flange per square inch of cross-section of the flange is therefore the total stress in one flange divided by the area of the cross-section of one flange in square inches; and the minimum area in square inches of the effective cross-section of the lower flange, which is in tension, at any point in the span equals the tensile stress in tons on the flange at the selected point, divided by the safe tensile strength of the metal in tons per square inch.

The student must be careful to notice that it is the effective cross-section of the lower

flange which is in question. This is usually taken as the cross section of the flange plates plus that of both arms of both the angle irons that fasten it to the web minus the rivet holes. When the rivets are set diagonally, as in the diagram (fig. 1), it is usual to take the effective section as equal to the net section on the line A B C D E F between the rivet holes, the oblique lines B C and D E being taken at three quarters of their actual lengths. But if this should give a greater area than would be obtained by deducting the area lost in all four holes B C D E from that of the cross section on the straight line A F, then this is taken as the effective area.

For girders under dead loads the safe tensile strength of wrought-iron is usually taken at five tons per square inch, and that of steel at eight tons per square inch.

The upper flange being subject to compressive stress, must be treated in a similar way to a pillar or strut in the manner we have explained in Chapter V. In this case the effective cross-section of the upper flange is equal to its entire section, because, the rivet holes being filled by the rivets, these resist compression equally with the metal in the plates, and consequently it is not necessary that they should be deducted as in dealing with the tensile stress of the lower flange.

The width of the upper flange is regulated by the length of the greatest longitudinal distance between those supports or stiffeners, which prevent the girder from yielding sideways. In single web girders it is customary to make the width of the flange not less than one-twentieth of the greatest longitudinal distance between the supports or stiffeners. If no stiffeners are used the proper width of the flange becomes one-twentieth of the span.

From what we have already said about the moments of rupture the student is aware that these decrease from the point of the greatest moment towards the end of the beam, and therefore also the flange strains, and consequently the required area of cross-section of flange to withstand the strain decrease in the same proportion. The variation of the amount of cross-section can, of course, be made in any way that the fancy of the designer may suggest, but it is usual to keep the width of each flange uniform throughout the whole length of the girder, and to obtain the required increase of each by increasing the number of plates constituting the thickness of the flange.

In very long girders it will, of course, happen that there are parts where the plates or angle irons are too long to be made in one piece, they are therefore connected by cover-plates in the case of the plates forming the flange, and by angle covers generally about 2 ft. long for scarfing the angle irons.

In order that each girder may be equally strong throughout, attention must be paid to the size of the rivets and their distance apart which is generally called the "pitch." The pitch of rivets or their distance apart from centre to centre is usually from 2½ to 6 in.

The greatest strain on each rivet in tons should be five times the crippling area of one rivet in square inches. The crippling area of a rivet in square inches is its diameter in inches multiplied by the thickness of the web plate in inches.

The horizontal rivets joining the vertical arms of the angle iron to the web are subject to the shearing stress in the web, which would be found as described in our last chapter. The number of rivets, therefore, in the depth of the girder on any one line will be the total shearing stress at that line in tons, divided by the

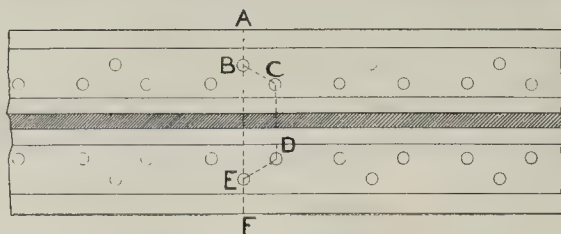


Fig 1

greatest strain allowed on each rivet, also in tons. If this in any case makes the pitch of the rivets less than about 2½ in., the thickness of the web should be increased.

We have said that the web has to resist the shearing stresses upon the girder, and to enable it to do this the most economical method of construction is to arrange for vertical stiffeners, which are usually placed at distances apart longitudinally, equal to the depth of the girder, except that this distance is seldom less than about 3 ft. or more than 5 ft., whatever the depth of the girder may be. The stiffeners may then be considered as resisting the vertical or shearing stress at the point where they are placed, whilst the portion of the web between the stiffeners has to resist a diagonal tensile stress, which is equal to the shearing stress multiplied by the length of a diagonal drawn across a panel between two stiffeners and divided by the depth of the girder. This last stress, however, need not be very particularly considered, because if the web is made strong enough to resist the crippling tendency of the rivets, it will also be strong enough to resist the diagonal tensile stress. The dimensions of the stiffeners will be found by regarding them as iron pillars or struts, and when the stiffeners are made of angle iron with unequal arms, the more economical arrangement is to rivet the narrow arm to the web, leaving the wider one projecting, thus increasing the radius of gyration as much as possible.

If no stiffeners were used, the web should then be regarded as resisting the shearing stress as a flat column or strut, the least diameter being the thickness of the web.

APPOINTMENTS.

DIOCESAN SURVEYOR.—At a recent meeting of the Archdeacons and Rural Deans of the diocese of Worcester, Mr. W. Hawley Lloyd, architect, of Birmingham, was appointed Diocesan Surveyor for that part of the diocese within the county of Warwick.

BOROUGH SURVEYOR, SOUTH SHIELDS.—A special meeting of the South Shields Town Council was held on the 9th inst. The first business before the meeting was the election of a surveyor in succession to Mr. Hall, who resigned some time ago. The Town Improvement and Sanitary Committee reported that there had been forty-three applications for the post, out of which number the following gentlemen had been selected.—S. H. Burgess, Borough Engineer, Stoke Newington, London, N.; John H. Campbell, City Surveyor, Canterbury; William Dawson, deputy City Surveyor, Bradford; John Ezra Miller, County Engineer's office, Shire Hall, Durham; John F. Smillie, Borough Engineer, Tynemouth; and John Witts, Chief Surveyor for sewers, &c., Leeds. The candidates were voted upon, with the result that Mr. Burgess was elected.

BOROUGH ENGINEER, KING'S LYNN.—At a meeting of the Lynn Town Council on the 9th inst., the resignation of Mr. E. J. Silcock, C.E., Borough Engineer, was accepted, but it was decided by the Council to retain Mr. Silcock's services for the completion of the works for a new water supply to the town and neighbourhood, and a scheme, which has been designed and commenced by him. We understand that Mr. Silcock has been appointed Engineer to the King's Lynn Harbour Conservancy Board, and that he will also carry on a general practice as a civil engineer.

BANK BUILDINGS, LLANDRINDOD WELLS.—A new block of buildings is about to be erected by Llandrindod Wells for the London and Provincial Bank, Limited. The directors have instructed their architects, Messrs. Wilson & Moxham, Swansea, to prepare the necessary designs for the building.

OBITUARY.

M. GINAIN.—We regret to have to record the death, at the age of seventy-two, of the eminent French architect M. Léon Ginain, whose name is as familiar to many of our readers as those of our eminent English architects. M. Ginain entered the Ecole des Beaux-Arts in 1843, as a pupil of Hippolyte Lebas, and obtained a "deuxième grand prix de Rome" in 1849. In 1852 he obtained the "premier grand prix" for a design for a gymnasium, during his residence at the Villa Medici and during his travels in Greece he made a remarkable series of drawings of the temple of Antoninus and Faustina, a temple of Nike Apteros, and of the theatre of Pericles in Sicily. On his return to Paris he accepted an appointment in the department of Intimations Civils, and became the assistant of Lafuel in carrying out alterations and additions to the Louvre. In the first competition for a new Opera House he was placed first; but the Consul-Général des Bâtimens Civils decided that there should be a second competition between the two candidates, which resulted in M. Chassériau obtaining the commission. It is said that a few days before the issue of the award, but when M. Garnier had been privately informed of it, he proposed to M. Ginain to become his partner in the work, but the latter felt that he could not accept so generous and kindly offer. M. Ginain was subsequently appointed architect to the City of Paris, which capacity he carried out several important buildings, notably the Faculté de Médecine, the Ecole Pratique, the Church of Notre Dame des Champs, the Galliera Museum*, and the hospital underd at Clamart by the Duchesse de Galliera. His numerous works in hand did not, however, interfere with his founding an atelier at the Ecole des Beaux-Arts, which had a great reputation, and whence issued many celebrated pupils, amongst whom may be named M. Seillier de Gisors, M. Dutert, M. ulin, M. Blavette, M. Bertone, and M. Patouillard. M. Ginain was elected a member of the Institute in 1876, and was an "Officier" of the Legion of Honour, Member of the "Conseil Supérieur des Beaux-Arts," and member of the "Société Centrale des Architectes." A man of a kind and benevolent nature, he was greatly beloved by his pupils, and enjoyed the esteem and respect of all who knew him. His death is a serious loss to French architecture.

SIR HENRY BESSEMER.—The death of Sir Henry Bessemer, at the age of eighty-six, carries us back to the conflicts and successes of a previous generation, the results of which however have been of the most important and permanent kind, and have converted Bessemer's name for ever with one of the most important improvements ever made in the manipulation of iron. It is now about forty years since brought forward his scheme for the decarbonization of iron by blowing air into it when in a molten state, and substituting this mechanical method for the slow and laborious process of "puddling." The adoption of such a process would no doubt have come sooner or later, but it would have been a good deal delayed had not Bessemer added to scientific perception the qualities of intuition and belief in himself, which led him to bark on the enterprise of himself producing steel by his process, when he found that manufacturers were sceptical and uncertain about it. The result, in a very short time, was fame and fortune, a revolution in the iron and steel manufacturing trade, and an immensely wider application of steel for structural purposes than would have been economically possible under the old process. The Bessemer process may also be said to have been a benefit to humanity in another sense, in removing from steel manufacture the necessity for the peculiarly odorous and exhausting work of "puddling," tried on as it necessarily was under the additional drawback of exposure to fierce heat. Sir Henry Bessemer had a good many other scientific interests, he was an experimenter in various directions. His ambition for cancelling the motion imparted by sea, and thus doing away with sea-sickness, was never a failure, and other things which he tried did not seem to have got much beyond the stage of working with science; but his one success had greater results, both for himself and his generation, than it often given to one man to secure.

GENERAL BUILDING NEWS.

ADDITION TO BIRCHANGER CHURCH, ESSEX.—A new chancel is to be added to this church. Sir Bur Blomfield is the architect.

CHURCH, HARROGATE.—The foundation stone has just been laid of the new Church of St. Mark, Harrogate. The new building, which will be built in the designs of Mr. J. O. Scott, of London, the Essex Architect, will be erected on a site fronting Leeds road. The structure will comprise nave, chancel, and south aisle, and a chancel, with chapel on the south side and organ chamber on the north. A large double vestry will lie to the south of the nave. The general design is to be completed by a tower at the west end. The seats, stalls, and other fittings will be oak, and electricity will be the dominant. The church, exclusive of the tower, is

estimated to cost between 11,000*l.* and 12,000*l.* The seating accommodation will be 800, but it has been decided to erect at present only the nave and side aisles.

RESTORATION OF ST. JOHN'S CHURCH, BLACKHEATH.—Some alterations have just been carried out at St. John's Church, Blackheath. The side galleries have been removed, and in order to provide sufficient accommodation, a light gallery, with open-work front, has been erected at the west end, and a new staircase has been constructed, with a new exit through the south wall of the tower. In addition, the roofs of the chancel, nave, and aisles have been boarded, the walls cleaned and re-coloured with a light dado, and the reredos re-gilded. A new stone pulpit has been erected, the architect being Mr. E. Dru Drury.

WESLEYAN CHURCH, NEW HIRST.—The new Wesleyan church at New Hirst was opened on the 5th inst. The new building occupies a site at the eastern extremity of New Hirst, with a frontage to the main road from Ashington to Newbiggin. The building is built of rock faced freestone obtained from the North Seaton Quarries. The contractors for the work were Messrs. Cocks Bros., of Blyth and Ashington, and the new church has been erected and furnished at a cost of 1,000*l.* The style is Queen Anne and Mr. W. G. Taylor, of Newcastle, was the architect.

CONGREGATIONAL CHURCH, HALTON, LANCASHIRE.—The foundation stone has just been laid of a new Congregational Church, Halton. The building will be divided into a church and a school. There will be an entrance through a porch to the church, and from the church two doors will lead into the school, which will also have a separate entrance from the yard. The church will be furnished to seat 200 people, the school 120, and the whole is estimated to cost about 1,000*l.* The contracts have been let as follows:—Mason's work, Mr. R. L. Dilworth, Lancaster; joiner's, Messrs. R. S. Wright & Son, Lancaster; plasterer, Mr. Tili, Lancaster; plumbing, Messrs. Abbott & Co., Lancaster; painting and decorating, Messrs. Wrightson, of Bolton and Carnforth. The architect is Mr. G. Wright, Lancaster.

METHODIST CHURCH, WEST HARTLEPOOL.—Plans of a new church to be erected by the members of the Methodist New Connexion body at West Hartlepool have been passed by the Plans Committee of the West Hartlepool Corporation. The trustees have secured a site bounded by Lansdowne-road, Park-road, and Wansbeck-gardens. The plans provide for the erection of a church capable of accommodating 500 persons. It will have two aisles and two transepts, an organ chamber, minister's vestry, choir vestry, &c. The Sunday schools are to be on the west side of the church. They will be 60 ft. by 30 ft., and will provide accommodation for between 350 and 400 scholars. The cost of the building is estimated at between 3,000*l.* and 4,000*l.* Mr. James Garry, of West Hartlepool, is the architect.

WESLEYAN SCHOOLS, HULL.—A block of buildings has been erected at the rear of Coltmans-street Wesleyan Church, for Sunday schools and other purposes. The plans were prepared by Mr. W. A. Gelder, architect, and the builder was Mr. Geo. Houlton. The central hall will accommodate about 80 children, and attached there are an infant schoolroom, seventeen class-rooms, ladies' parlour, &c. The schools were heated by Mr. G. F. Wells, the electric lighting installation has been supplied by Mr. Kitching, the joiner work by Mr. Skinner, and the painting by Mr. G. Harbison.

BELMONT CONGREGATIONAL CHURCH, ABERDEEN.—The new mission hall in West North-street, Aberdeen, has just been opened for the Belmont-street Congregational Church. The new building is of two stories. It contains on the ground level a smaller hall, 32 ft. by 15 ft., two class-rooms, kitchen, and other accommodation, while the main hall on the first floor is 53 ft. long, with seating accommodation for between 300 and 400 persons. Messrs. Watt & Brown were the architects of the building.

ALTERATIONS TO WHEATLEY-LANE INGHAMITE CHURCH, BURNLEY.—The Inghamite Church, at Wheatley-lane, Burnley, was reopened a few days ago, after being closed for nine months for alterations. The present alterations comprise new roof and transepts. The building has also been fitted throughout with new pews of pitchpine, and the accommodation has been increased. The total cost of the alterations will be about 1,600*l.* or 1,700*l.* The main walls of the building have been raised and new windows have been inserted. The masonry work has been executed by Mr. A. Robinson, of Brierfield; the joiner's work by Messrs. R. Dean & Sons, of Burnley; the slating by Messrs. Stanworth, of Burnley. Mr. E. Butler, of Barrowford, has done the plastering. The architect was Mr. H. Whittaker, of Nelson.

IVY PLACE U.P. CHURCH, STRANRAER.—This church is designed in the late Decorated Gothic style, the walls built of dark-blue dressed whinstone, with hewn work of a cream white stone from Prudham Quarry, Northumberland. The roofs are covered with sea-green slates finished with red ridge tiles. The sittings provided are for 530 persons; the hall seats about 300, while the large session house can also be opened into it when required. There are also provided a ladies' room, vestry, kitchen, and

heating-room, with cloak-room and lavatory accommodation. The whole woodwork of the roof has been stained to an old oak tint, the seating and linings generally of an olive green shade, while the pulpit and gallery front are in light grey oak. The cost of the church will be about 4,000*l.* The work has been executed by the following contractors:—Mason, D. Purdie, Stranraer; Wright, D. Milligan, Ayr; plumber, J. Johnstone & Son, Glasgow; plasterer, James Torrance, Stranraer; slater, Wm. Auld & Son, Ayr; glazier and painter, S. Kemp, jun., Hamilton; Heating Mackenzie & Moncur; gates and railings, McCallum & Hope; gasfitting, Milne & Son; and upholstery, Francis Smith, all of Glasgow. The architect is Mr. John B. Wilson, of Glasgow.

SCHOOLS, BRONYFOEL, CARNARVONSHIRE.—The School Board of Llandwrog have opened new schools at Bronyfoel, near Carmel. Mr. R. L. Jones, Carnarvon, was the architect.

SCHOOL, LLECHRYD, RADNORSHIRE.—A new school has just been erected at Llechryd. The building is Gothic in style, built of stone with red brick facings. The architects were Messrs. James & Morgan, Cardiff, and Mr. Edward Morgan, of Tredegar, was the builder.

SCHOOLS, CARNARVON.—New schools, erected in the Pavilion Field, for the girls and infants under the Carnarvon School Board, have just been opened. The schools are in separate blocks and one story high. The girls' school has a frontage to North Penrallt, the infants' school to Twthill West. The two schools have been similarly designed, the exterior being faced with Rubon red brick and terra-cotta, with Yorkshire stone dressings, &c. The roofs are covered with Nantlle slates. The girls' school provides accommodation for 300 scholars, and the infant department for 325. The main room of the girls' school is 84 ft. long by 22 ft. wide, and 17 ft. high, and is divided by means of partitions into three departments. The class-rooms are 27 ft. by 24 ft., and have closed partitions. The main room of the infant department is 69 ft. by 24 ft., with two class-rooms of 24 ft. by 22 ft., and the main room is divided into two parts by partitions. Cloak-rooms and lavatories have been provided, and in the basement of the girls' school is a cookery class-room. The total cost of the schools, exclusive of site, is 5,210*l.* The work has been carried out from the designs and under the supervision of Mr. Rowland Lloyd Jones, architect, Carnarvon, the contractor being Mr. Owen Morris. Mr. John Jones, South Penrallt, has acted as the clerk of the works.

SCHOOLS, AYCLIFFE, DURHAM.—The new public elementary schools at Aycliffe, intended for the use of the displaced master and children of the old National Schools, occupy a position on the Durham-road. They consist of a large main schoolroom, 54 ft. long by 18 ft. wide, capable of division into separate apartments by means of a patent folding glazed screen, and a classroom 18 ft. square. The main room, 16 ft. high, is lighted by ten windows. There are separate entrance cloakrooms for boys and girls, with lavatories attached. The heating is by open fireplaces. The whole has been designed by Mr. F. H. Livesey, architect, Bishop Auckland. Mr. P. C. Scott, of Aycliffe, has executed the brick-laying, plastering, and joinery, with Messrs. Mascall, slaters, and E. Thompson, plumber (Bishop Auckland); John Law, painter, and Swale, ironwork (Darlington), as sub-contractors.

SCHOOL, RENFREW.—A new public school, erected on the southern outskirts of the burgh of Renfrew for the Landward School Board of Renfrew, was opened on the 8th inst. Built for pupils of both sexes, the school is three stories in height, and has accommodation for about 640. The ground floor is set apart as the infant department, and there is a large central hall for musical drill. There is also a room set apart for giving instruction in cookery. The estimated cost is about 7,000*l.* Mr. Henry Higgins, jun., Glasgow, was the architect.

HOSPITAL, RUCHILL, GLASGOW.—By permission of Mr. A. B. McDonald, City Engineer, a party from the Glasgow Association of Students of the Institution of Civil Engineers has visited the new hospital now under construction at Ruchill. The visitors were shown and shown over the works by Mr. Reid, who under the City Engineer, is responsible, according to the *Glasgow Herald*, for the designing of the hospital, and by Mr. Hannah, clerk of works. Operations have now been going on for nearly three years, and the masonry is practically complete, but two more years will probably elapse before the hospital is ready for the reception of patients. The western block, three stories high, is the administrative building. In the centre of this building are the private apartments and business rooms of the physician-superintendent, and of the matron, and dining-room, library, and bed-rooms for eight assistant house-doctors, while the two wings are reserved for the accommodation of nurses. Arrangements have been made for the reception of 202 nurses, each nurse having a separate bed-room, while there are sitting-rooms and a large number of bath-rooms reserved for their use. Between the two wings, and behind the doctors' quarters, is the nurses' recreation hall. Eastward from the administrative block runs the main avenue, on each side of which are the pavilions for the patients. There are eight pavilions on each side of the main avenue, sixteen in all. Each contains a charge-nurse's room,

* Illustrated in the *Builder* for January 6, 1894.

in which is a large store cupboard, and which, in place of side walls, has glass partitions, so that the nurse can overlook, on the one side, the acute ward, in which will be some twelve beds, and on the other the convalescent ward, containing some six beds. The wards are high-ceilinged. The pavilions, which are built of terra-cotta brick, with redstone finishings, are all only one story high, and have no communicating corridors from one to another. Half-way down the main avenue, on the north, is the kitchen and stores building, wherein will be the shops of the butcher, baker, shoemaker, tailor, &c., and the main hospital kitchen. Here will be prepared all food for patients, and thence it will be distributed by means of special vans to the various pavilions. On the opposite side of the main avenue from the kitchen will be the water-tower, while behind it are the residential quarters for all the women servants. The eight pavilions west of these blocks will be reserved for women, and those to the east for men. At the east end of the main avenue are grouped the museum and mortuary, the boiler-house and destructor, the laundry, and the stables. In the mortuary building is a small chapel, wherein funeral services will be held. Alongside the boiler-house is a chimney 150 ft. high. Of the destructor, for infected bedding, &c., there are as yet no visible signs. The stables offer accommodation for a dozen horses, with shedding for vans and cabs, also storage. The laundry consists of three washing-houses and three drying-chambers. In the centre of the frontage to Bilsland Drive is the inquiry block, in the hall of which, at stated times, a patient's friends will be enabled to hear of his or her welfare from the nurses in attendance—one from each ward. In this block also are the dormitories, dining and recreation-rooms for the men servants. At Ruchill all infectious diseases, with the exception of small-pox, will be treated.

COTTAGE HOSPITAL, ACCRINGTON.—The Accrington and District Victoria Cottage Hospital has just been opened. The hospital, which has cost about 7,000*l.*, is situated at the top of the Whalley-road. It will accommodate eighteen patients. The architects were Messrs. Haywood & Harrison, Accrington.

NEW THEATRE FOR NORWICH.—The Norfolk Hotel Estate, Norwich, has been sold to a syndicate of London gentlemen, who propose to build a new theatre upon the site. Plans for the theatre are being prepared by Mr. Ernest Runtz, architect, London.

PROPOSED MODEL LODGING-HOUSE FOR CARLISLE.—The Company which was recently formed to erect and carry on a model lodging-house in Carlisle have had plans prepared by Mr. H. Higginson, architect, of a building which it is proposed to erect at the north-east corner of Drover's-lane. On the ground floor it is proposed to have five lock-up shops (with cellars in the basement). The lodging-house will be entered from Drover's-lane, and on the ground floor, to the rear of the shops, the plans show a large dining-room, a kitchen, a scullery, lavatory accommodation, and a yard, with washing-shed, changing-boxes, &c. The sleeping accommodation will be on two floors above the shops, dining-hall, and kitchen, and on each floor there will be sixty-one cubicles, or separate sleeping apartments, and a large dormitory; altogether provision will be made for 170 beds. There will be lavatories on each floor, and other conveniences. The caretaker's rooms are shown in the basement, where there are also store-rooms, drying-shed, laundry, boiler-house, &c. The building (which is for men only) will cost about 6,000*l.*

PUBLIC BATHS, SHAW, OLDHAM.—A Local Government Board inquiry has just been held at the Town Hall, Shaw, before Mr. H. P. Boulnois, M.Inst.C.E., respecting the application of the Crumpton District Council for sanction to borrow the sum of 5,200*l.* for the provision of public baths for the district. The Clerk (Mr. J. H. Mills) stated that the District Council advertised for designs, and out of sixteen, that of Messrs. Wild, Collins, & Wild, of Oldham, was selected. Mr. J. Wild was called, and gave evidence in detail as to the proposed building.

LORD MAYOR'S ROOMS, LEEDS.—The Lord Mayor's rooms at the Leeds Town Hall are about to be altered from plans prepared by Mr. W. H. Thorp, architect, Leeds. Not only the corridor adjoining the present apartments, but the ante-rooms on the opposite side are to be utilised in the carrying out of the suggested improvements. Immediately at the top of the present staircase will be a vestibule. On the right of this is to be a ladies' cloak-room, and on the left a small room that will be available for meetings. The vestibule will lead to a reception room 50 ft. long by 20 ft. wide. Between this apartment and a larger room—50 ft. long by 30 ft. wide—to be used for dining purposes, a couple of pillars with Corinthian capitals will stand. These will mark the place where an arched screen might be put, to divide the two apartments when only one is required. The present private room of the Lord Mayor will not be structurally interfered with. Servants' rooms, wine and other store rooms, are also provided for in the scheme.

THE STAFFORDSHIRE BUILDING TRADE.—The building trade throughout North Staffordshire is in a flourishing condition. At Burslem, bricklayers report a small percentage out of work, but joiners

are well employed. In Hanley all branches are busy, with none out of employment. A similar remark applies to all the other pottery towns. At Leek, bricklayers report a general improvement in the state of employment, with a small number out of work. Joiners are well employed. Plasterers and stonemasons are busy. At Crewe, all branches are busy, and there are no operatives out of employment. At Stafford the building trade is good, stonemasons being particularly busy. Painters and plumbers have a few out of work.

DRILL HALL, HEATHFIELD, SUSSEX.—A new drill hall, intended for the use of the Heathfield detachment of the 2nd Sussex Artillery Volunteers, has been erected in the Station-road. Messrs. Stevenson & Earp, Eastbourne, were the architects.

BUSINESS PREMISES, BELFAST.—A new linen warehouse was opened on the 11th inst. in Donegal-place by Messrs. Murphy & Orr. The building is lighted throughout by electricity. Messrs. J. J. Phillips & Sons were the architects, and the work was completed by Messrs. John Lowry & Son. Messrs. George Merrow & Son carried out the work of decoration, and Messrs. Greenhill & Craig the electric light installation.

NEW INLAND REVENUE OFFICES.—The block of buildings occupying so commanding a position at the corner of Wellington-street, Strand, are nearly ready for occupation. The Inland Revenue Department take possession of the first and upper floors, consisting of about forty rooms. It is understood that nearly 3,000*l.* a year is to be paid for them. The ground floor is devoted to shops and to the principal entrance to the offices above. The building is in terra-cotta, with a green slate roof. The architect is Mr. A. N. Bromley, of Nottingham.

SANITARY AND ENGINEERING NEWS.

FRASERBURGH WATER SUPPLY, ABERDEENSHIRE.—On the 8th inst. the Fraserburgh Burgh Commissioners attended the formal turning on of the new service of water to the higher levels of the town. The newly-completed works—which were in the hands of Mr. Jenkins, C.E., Aberdeen—were carried out under the superintendence of Mr. William Alexander, Burgh Surveyor, and form part of a larger scheme that the Commissioners have in contemplation, it being intended, by-and-by, to introduce an additional supply of water—at a cost of 7,300*l.*—from Kirkmyres and Boyndlie.

PROPOSED PIER, MENAI BRIDGE.—The Local Government Board, subject to the approval of the Board of Trade, has sanctioned the loan for the construction of a pier at Menai Bridge. The designs of Mr. Webster, engineer, Bangor, have been accepted.

LEEDS INFECTIOUS DISEASES HOSPITAL.—The warming and ventilation of this hospital is to be carried out by Messrs. Dargue, Griffiths, & Co. of Liverpool, as the result of a competition for the best method of warming and ventilating the building.

MANCHESTER SEWAGE EFFLUENT.—The Effluent Sub-Committee of the Manchester Rivers Committee has agreed to recommend to the committee, and through it to the City Council, the adoption of a system of treatment of the effluent in place of the rejected culvert scheme. The members of the sub-committee have visited a considerable number of places where various methods of treatment are in force, and they have decided in favour of land filtration. No additional land will be required beyond what is already available at Davyhulme.

THE YORK SEWAGE WORKS, &c.—At the York Guildhall, on the 11th inst., Colonel A. G. Durnford, R.E., an inspector of the Local Government Board, held an inquiry with reference to the application of the City Council to borrow 23,000*l.* for sewage disposal works, 20,000*l.* for the electric lighting of the city, 11,850*l.* for street improvements, and 350*l.* for the construction of an underground latrine. The Town Clerk (Mr. W. H. Andrew) stated, in reference to the electric lighting scheme, that the first area proposed to be lighted was only four streets, Cony-street, Spurrigergate, High Ousegate, and Parliament-street, but subsequently was extended to extend the area to other streets in the centre of the city. These streets were Low Ousegate, Clifford-street, Market-street, Feasegate, Davygate, St. Helen's-square, Stonegate, Lendal, Museum-street, and St. Leonard's.

—Professor Kennedy explained the system of light proposed to be adopted, stating that the lighting station was to be constructed on the Foss Island. Tenders for the work had been received. Evidence was next given as to the 23,000*l.* required for sewage disposal works. The Town Clerk stated that the Corporation had already powers to borrow 101,100*l.*, but the actual expenditure had been 205,676*l.* 15*s.* 10*d.*, and it was estimated that the further expenditure would be 8,427*l.* 4*s.* 2*d.*—Mr. Meek opposed this application on behalf of the present riparian owner, Lord Westwick, and also on behalf of the fishery of the Yorkshire Fishery Board, and Mr. Trevor Edwards, clerk of the West Riding of Yorkshire Rivers Board, also opposed. The City Surveyor, Mr. A. Creer, stated that the excess of the cost of the sewage works was mainly attributable to the increase in the cost of material and labour. He read

a letter from Mr. Mansergh, engineer, which had been addressed to the Town Clerk some time ago, explaining that the increased cost could not be foreseen at the time the work was commenced. The quantity of water that would pass through the works would be 55,400 gallons per acre per twenty-four hours. The filter beds that it was proposed to put down would be purely experimental. There were about 26 acres of land at Naburn and about 7*½* 3*¼* 24*p.* were occupied by the buildings, tanks, &c., leaving 18*½* 1*½* 35*½* available for other use. Nothing had been done in the way of utilising the land, and about one-third of the area was submerged on the occasions of an 8 ft. flood, which occurred about five times per annum. The land was not suitable for irrigation, and he pointed out that the minimum flow of water in the river past the works was about 140 million gallons per day, and it was estimated that in dry seasons it might be as low as 117 millions.

DRAINAGE SCHEME, ANDOVER.—Mr. Herbert H. Law, one of the Inspectors of the Local Government Board, recently held an inquiry at the Town Hall as to the proposed scheme for the drainage of the town, for which purpose sanction was asked to borrow a sum of 7,500*l.* Evidence was given by the Borough Surveyor, Mr. W. H. White, and other gentlemen.

DOCK EXTENSION, SWANSEA PORT.—The Marchioness of Worcester has just laid the memorial stone of dock extensions at Swansea. The extension is one of a series now in hand in the port, and consists of an addition to the Prince of Wales Dock by which the wharfage is increased 50 per cent. Tenders for the works were invited in the spring of 1895, and the tender of Sir John Jackson, of Westminster, was accepted by the trustees, and the works were begun in February 1896. The area of the extension at ordinary spring tide level is 43 acres, with a depth of water of 28 ft. The effective length of quay frontage is about 2,000 ft. The walls are built of native stone, the masonry being rough rubble faced up to water-level with fitted rubble, and above that level up to the underside of the coping with dressed ashlar. The coping is corinthian granite with the exception of that round the coal hoist piers and on the top of the slag embankment between the two easternmost tips. A number of iron ladders sunk flush with the surface of the walls afford means of landing from boats. In addition to these ladders, a granite stair case is provided at the north-east corner of the dock. The works have been designed by and carried out under the direct supervision of Mr. A. O. Schenk, the Trustees' Engineer. The cost of the undertaking is about 70,000*l.*

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, GREAT HAMPTON PARISH CHURCH, BUCKS.—In this church a memorial stained glass window, dedicated to the memory of John Hampden, has just been inserted. Messrs. Ward & Hughes, of London, have carried out the work.

MEMORIAL WINDOW, WARTON, LANCASHIRE.—A three-light stained glass window has just been fixed in the parish church, in memory of the late Mr. W. B. Bolden. The centre light contains the figure of St. Oswald, and the side lights are occupied with figures of two other northern saints, viz., St. Patrick and St. Aidan. The window is placed on the north side of the church. It is the work of Messrs. Shrigley & Hunt, of Lancaster.

REPERDS, PAULERS PURV.—The new rereds was unveiled on the 9th inst. The work throughout is in oak: the central portion taking the form of a triptych, being divided into seven compartments; the middle having three bays fixed, and containing the "Holy Family" with Shepherds and Magi; adoration; on the two left-hand shutters "The Annunciation"; and on the two right-hand shutters the "Presentation in the Temple." All these panels are very elaborate, and in gold grounds, richly diapered and raised. The arms of the arch-diocese and diocese are emblazoned on the outer points of each external shutter. Pinnacles of varied form break up the portion, and are arranged in front of the stone mullions of the four-light east window, a curvilinear line has been adopted for the tracery, concealing any of the figure subjects in the window. The carved-work throughout is elaborately tracery and carved—the cusp terminations with rosette and the cornices with square flowers, no two being similar. The wings on either side are of oak, a shafted, panelled, cusped, and carved. The whole is the gift of the rector, the Rev. J. B. Harris, R.D. The paintings are the work of Mr. N. H. Westlake of Vauxhall. The whole has been erected from the designs and under the personal direction of Mr. E. Swinfen Harris, architect, London, at Stony Stratford.

WINDOW, ALL SAINTS' CHURCH, MAIDENHEAD.—A new window has recently been placed in All Saints' Church, Maidenhead. The window commemorates the landing of St. Augustine. The window was executed by Messrs. Butler & Bayne, of London.

MONUMENT, BEER CHURCH.—A sculptured monument has been erected in the south aisle of Michael's Church, in memory of the late Mr.

bella Agnes Byles, of Whitecliff Glen, Ber. It has been executed in the studios of Messrs. Harry Moss & Sons, of Exeter.

FOREIGN.

FRANCE.—The Chamber of Deputies have unanimously passed the Paris Metropolitan Railway Bill at last, and authorised the municipality of Paris to borrow 165 million francs for its construction. The scheme has gone up to the Senate, which will probably pass it before the end of the month. The ten young architects admitted "en loges" in competition for the Prix de Rome are MM. Bigot, Gaudet, Faure-Dujarric, Carré, and Sènes. The works at the Lyons railway station have been actively pushed forward, and in place of the old elevated platforms there are now four large halls, rising on the side next the Rue de Bercy, which is not likely, however, that the whole contemplated station will be completed before 1902. The Carnavalet Museum has acquired recently some portraits of leading Revolutionists—Camille Desmoulins, Robespierre, Saint-Just, and others, which were left to the museum by a recently-deceased Senator, M. Amel. They are works of high artistic value. A new archaeological society has been founded in the Sixth Arrondissement of Paris (Luxembourg) with the intention of establishing a museum. The Government has formally approved of the models executed by M. Chaplain for the new gold coinage. On the obverse is a head of The Republic with the Phrygian bonnet; on the reverse the Gallic cock. A committee has been formed at Paris to erect a monument, by subscription, to Alphonse Baudet. M. Gelineau, architect, of Bordeaux, has been elected President of the Architectural Society of Bordeaux and the south-west of France.—M. Amson, architect, has been commissioned to carry out, at the angles of Rue Pierre Charron and Rue de Chaillot, a large building which, under the title of Galerie de Charité, is to replace the bazaar in the Rue de la Charité, which was destroyed in a terrible manner. A new building to be in stone, brick, and iron, is to have, towards the two streets, a very simple elevation in a kind of neo-Byzantine style, and will include a large central hall with three naves, and with side galleries on two stories. The building will be completed in a year.—The death of a young man, aged 43, of M. Jules Victor Thiebaut, a judge in the Tribunal of Commerce, but whose name is more widely known in connexion with the great house of founders in art work, Thiebaut Frères, of which he was a member.

AUSTRIA.—New offices for the imperial railway are to be erected at Linz.—A large site has been acquired in Prague for the erection of a deaf-and-dumb institution.—The Bohemian Landtag has voted a certain grant of 20,000 florins for the erection of a School of Agriculture at Budweis, subject to certain conditions respecting the choice of site.—The Council of Reichenberg have set aside 100,000 florins for the erection of an asylum in the town, and have given directions that the work be started without delay, so that the shell of the building may be finished and roofed this year. They have also voted 50,000 florins for improved buildings for St. Stephen's Hospital.—The Council of Aussig have resolved to raise a loan of fifteen million florins, 600,000 of which are to be devoted to the construction of an electric railway, and 90,000 to the erection of various public buildings.—New official buildings are to be erected at Odrau (Silesia).—Several public buildings are projected at Pettau, such as a school, a school, &c. A loan of about 500,000 florins is being raised by the Municipal Council, partly for this purpose, partly for the extinction of a mortgage.—It is proposed to erect public hospitals at Windischgraz, Voitsberg, and Muran, in Styria.

THE Landtag of Styria has voted a grant of 100,000 florins for the erection of a school of forestry at Bruck, to be commenced in the spring of this year and finished in autumn, 1899.—A new school and a new church are to be erected in Leipa. Last year the Church of St. Cross was restored, though the popular desire was rather in favour of its demolition and the erection of the new church on its site. Instead, however, the old school was to be erected there, and the old schools will then be destroyed, and their site made available for the new church.—At Saz, Bohemia, 30,000 florins have been voted to defray the expenses of alterations in the plans of the new hospital, including the installation of electric light. For the restoration and decoration of the decanal church in the same town 13,000 florins have been set aside.—Electric works are to be erected at Tolban, Moravia.—At Weisskirchen, Moravia, a school for Czechs is about to be built.—The birthplace of Fischer von Erlach (born 1656), one of the greatest architects of Austria, has been discovered at Graz, and is to be marked with a tablet.—A great Jewish temple is to be erected at Budapest; a competition (limited to Hungarians) for the best plans is offered.—The erection of a custom-house at Skala, Galicia, necessitates the erection of a bridge over the river Zbrucz. The cost (16,200 florins) will be defrayed, half by Austria, half by Russia.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. E. E. Croucher & Co., land agents, surveyors, and auctioneers, have removed their offices from 76, Chancery-lane to 1, Old Sergeants' Inn, Chancery-lane, E.C.

ANCIENT CROSSES OF LANCASHIRE.—A meeting of the members of the Lancashire and Cheshire Antiquarian Society was held on the 4th inst., in the reading-room of the Chetham Library. Mr. C. W. Sutton presided. A paper prepared by Mr. Henry Taylor, of Southport, upon "The Ancient Crosses of Lancashire," was read, in the absence of the writer, by the Rev. E. F. Lettis. The paper, it was explained, was the first of two or three papers on the subject, it having been found impossible to bring the whole of the information obtained by Mr. Taylor within the limits of one address. The crosses, said the author, illustrated an interesting phase of our national life in past centuries. Wayside, market, and other crosses were scattered throughout the county in amazing numbers. They were particularly numerous in the hundreds of Leyland and West Derby. He had notes of not less than 150 crosses. The extraordinary number of wayside crosses in West Lancashire might, perhaps, to some extent, be accounted for by the fact that many of the landowners were Roman Catholics, and therefore free from iconoclasm. They probably marked the spots where priests from neighbouring abbeys held services, and near the abbeys of Whalley, Penwortham, and Burscough wayside crosses abounded. The crosses of Lancashire were classified as follows:—Fencing crosses, churchyard crosses, roadside or weeping crosses, market crosses, boundary crosses and mere stones, crosses at crossroads, crosses at holy wells, sanctuary crosses, crosses at gateposts, memorial and murder crosses. Mr. Taylor proceeded to discuss the subject of the crosses under these several heads. Crosses at Whalley were, he said, ascribed to the seventh century, and Bede was quoted in support of the supposition that they might have been erected to commemorate the preaching of Paulinus. Town crosses might be identified as the ancient meeting-places of local assemblies all over England; and that Paul's Cross, London, was a place of assembly there was not the shadow of a doubt.—In the course of discussion Mr. W. Bowden said that when the Ship Canal was in course of construction the shaft of a cross, distinctly of Saxon origin, was found in the neighbourhood of Eccles. He endeavoured, with the aid of Mr. Bourke, the then resident engineer of that section of the canal, and Sir W. H. Bailey, to get it placed in Eccles Church, which he conceived to be the proper resting-place for such "finds," but was unsuccessful. It was now at Owens College, and he was not without hope still of succeeding in getting it removed to Eccles.—*Manchester Guardian.*

ROCHDALE BUILDERS' ASSOCIATION.—The annual meeting of members of the Rochdale Master Builders' Association was held at the secretary's offices, 100, Yorkshire-street, Rochdale, recently. Mr. W. Peters, retiring President, was in the chair. The annual report, noting alterations in working rules and wages, and the state of trade, and showing an increase in members, was presented by the secretary. The treasurer's report, showing a gain on the year's working, was adopted. The following officers were elected for the ensuing year:—President, Mr. Thomas Wilkinson; vice-president, Mr. Frank Nichol; treasurer, Mr. John Coates; committee, Messrs. William Peters, William Asworth, Thomas Turner, James Healey, Thomas Taylor, R. Robinson, Robert Woolfenden, and W. H. Pickard. Mr. Wm. Peters was elected representative on the United Federation of Lancashire and Cheshire Building Trade Employers; and Messrs. Wilkinson, Nichol, and Robinson representatives to the quarterly meetings of that body. Mr. W. Shepherd was re-elected secretary.

ORGAN AT WEST PARISH CHURCH, HELENSBURGH, N.B.—A new organ has just been placed in this church. It was made and erected by Messrs. Lewis & Co., Limited, London. The organ case was designed by Mr. William Leiper, R.S.A., and is in harmony with the church interior.

WATERBORNE TYPHOID.—At the Sanitary Institute on the 6th inst., a paper was read by Dr. Childs, on waterborne typhoid. After reviewing the various causes of typhoid fever, he pointed out that the protection of water supplies was the one measure calling for immediate action. The present law was quite inadequate. The first requirement was the thorough and systematic inspection of the water supplies from source to distribution, but the duty of taking action was thrown on the sanitary authorities who had only enabling, not compulsory, powers, and were themselves often the greatest polluters. The chief obstacle to reform was the ignorance and indifference of the public. He contended that the sanitary authorities should have free access to water supplies and should provide for their inspection and analysis; (2) that water companies should publish full information as to their water; (3) that they should be required to make regular inspections and analyses and publish the reports; (4) that they should be made responsible for the consequences of pollution; (5) that willful pollution of water should be a penal

offence; (6) that public authorities should be appointed for the care and protection of watersheds. A discussion followed. Dr. Sims Woodhead suggested that sanitary authorities should have rights of supervision over water companies and that the responsibility for pronouncing on the sufficiency of the water should fall upon them. The whole question should be placed under the control of a central board. Major Flower, Engineer to the Lee Conservancy Board, advocated individual action in getting rid of river pollution. Dr. Parkes thought the protection of watersheds might very well be entrusted to county councils.

RICHMOND (SURREY) ELECTRIC LIGHT AND POWER COMPANY.—At the fourth ordinary general meeting of this company, held on Thursday last week, it was stated that the capital account exhibited an increase of 3,000l., which had been received on loan from the County of London and Brush Provincial Company. This 3,000l. had been expended chiefly on mains, extensions, accumulators, and meters. It is the intention of the Board to lay down, in time for next winter's lighting, additional plant, so as to be able to meet the growing demand for current. They also contemplate extending their mains to a number of the principal residential streets of the borough.

NATIONAL REGISTRATION OF PLUMBERS.—The annual public meeting of the Bradford District Council, in connexion with the National Registration of Plumbers, was held on the 9th inst., at the Technical College, Bradford. Mr. Charles France, architect, presided, and he was supported by Alderman Richard Hind, Master of the Plumbers' Company; Dr. Evans, Medical Officer of Health; Mr. James Watson, City Waterworks Engineer; and Mr. J. H. Cox, City Surveyor. Dr. Evans, in seconding the adoption of the report, said that the work of registration was certainly progressing. He hardly needed to point out the value which all sanitarians attached to the efficiency of plumbers' work. It was very often the scamping of plumbers' work, or the employment of unqualified people, which was the cause of the preventable diseases which were the scourge of communities.—Alderman Hind said it was admitted on all hands that much of the preventable disease of the country was caused by bad plumbing work inside the house, and it was, therefore, regarded as most important that some provision should be made whereby any person who wanted to employ a plumber should be able to know whether or not the person whom he had in view had had the necessary and proper training. Speaking of the Plumbers' Company, he said that though for a time it had passed out of the hands of the plumbers, it was now interesting itself in the trade in a very practical way. Mr. James Watson proposed a resolution, "That this meeting reaffirms the desirability of the speedy passing into law of the Plumbers' Registration Bill."—Mr. F. W. Richardson, City Analyst, then delivered a lecture on "Microbes and Sanitation," in which he described and illustrated the nature of microbes, the various preventable diseases, the conditions favourable to diseases and epidemics, the influence of filth, bad water supplies, and defective plumbing, and the importance of sanitation generally in regard to diseases.

ANTIQUARIAN DISCOVERIES IN NORTH WALES.—The opening up of the Friars' Estate at Bangor continues under the superintendence of Mr. P. Shearson Gregory, architect. The workmen have just come across a carved stone slab, with a floral cross similar to that on the first slab discovered, and of the same date, viz., the fourteenth century. The slab was, however, incomplete, the head being missing. The other portion was broken in two, but the whole slab is estimated to have measured about 6 ft. in length by about 3 ft. wide. Messrs. Gregory and H. Hughes and Professor White, of the Bangor University College, now consider that the so-called stone pavement discovered previously was the pavement of one of the walls of an ancient building, and many portions of these walls have been discovered in different parts of the excavations. Mr. Gregory is about to prepare a plan showing the whole of the ancient building, which is now surmised to have been a small Grey Friars Monastery or Friary.

MUNICIPAL BUILDINGS, SOUTH SHIELDS.—At a special meeting of the South Shields Town Council on the 6th inst., the following resolution of the New Municipal Buildings Special Committee was considered, viz., "That the Council be recommended to invite architects to send in competitive designs and drawings for new municipal buildings to be erected on the Ogle-terrace site, at a cost not exceeding 20,000l., exclusive of furniture, and that premiums of 100l., 50l., and 25l. be offered for the first, second, and third designs respectively, in order of merit, the selection to be left in the hands of a referee to be appointed by the Council, and that the Town Clerk and Borough Surveyor be instructed in the first place to prepare 'instructions to architects,' with full conditions and details of the completion and the requirements of the Corporation, and submit the same to the committee for approval." At the previous meeting of the Council there was a motion for the adoption of the report and an amendment to leave out the portion relating to the obtaining competitive designs, and to adopt only the part relating to the preparation of instructions to architects. Considerable discussion took place with regard to

this question. Ald. Readhead said that he thought the time had not yet arrived when they should erect municipal buildings. The amendment was eventually put and carried by 23 voting for and 12 against.

MARLBOROUGH HOTEL, ST. JAMES'S.—We understand that Mr. G. D. Martin has been appointed architect of the hotel to be erected on the site of "Ramsay's" Hotel, together with Nos. 12, Bury-street, and 12 and 14, Ryder-street. The last-named street was first built in 1674; Bury, or, rather Bury-street, was laid out about the same time, and named after the ground landlord, one Captain Berry, who had served as a lad under Charles I. and died in 1735, being more than a hundred years old. It has had many celebrated inhabitants, amongst them being Haydn (at No. 1), removing from High Holborn; Swift, Steele, Thomas Moore (No. 33); Crabbe (No. 37), and at No. 19, in 1820, Daniel O'Connell. During the interval September 10 to November 28, 1835, at No. 35 Mendelssohn had his lodgings.

THE "SHIP AND TURTLE." LEADENHALL-STREET.—A company is formed for taking over the business of this old-established tavern, which, under sign of the "Ship" claims to have been founded in the reign of Richard III. The premises were erected by the Painter family about thirteen years ago, and are held on lease for eighty years from Christmas, 1881, at a ground rent of 1,700l. per annum.

CENOTAPH, HIGHGATE CONGREGATIONAL CHURCH.—A cenotaph has just been erected in memory of the late pastor of this church. It is composed mainly of polished English flint. The monument is carved on a panel of Castellino marble, and in letters of gold is an inscription. The work was designed by Mr. Edward Paine, and has been executed by Messrs. Harry Hems & Sons, of Exeter.

THE COMMISSION ON THE SEWAGE QUESTION.—According to the *Times*, the Royal Commission about to be appointed to consider the various phases of the Sewage Question will be a small body, consisting, in all probability, of seven members. The chairman, who will be a gentleman prepared to enter upon the inquiry with unbiased mind, will be supported by an eminent chemist, a well-known bacteriologist, a couple of engineering experts familiar with the different methods of urban drainage, and probably two Local Government Board officials specially qualified to speak with authority upon sewage matters.

METROPOLITAN ASYLUMS BOARD.—An ordinary meeting of the managers of the Metropolitan Asylum District was held at the County Hall, Spring-gardens, on Saturday, last week, Sir Edwin Galsworthy, the Chairman of the Board, presiding. During the sitting, the Board proceeded with the adjourned consideration of the report of the Special Committee in the matter of the Brook Hospital expenditure, which had exceeded the estimate by about 50,000l. The committee had recommended the payment of the contractors' claims as finally adjusted by the architect, and the renewal of an application to the local Government Board for an order authorising the further expenditure on loan, in respect of the erection, equipment, &c., of the hospital, of the sum of 100,000l. in lieu of the sum of 75,000l. applied for on October 10, 1896. To this Mr. J. H. Brass had moved as an amendment, "That the report be referred back to the committee for them to report to the cause of the extra expenditure, as to the several contractors not executing the works in accordance with the sealed contracts, as to the power of the architect to order additional work without the authority of the Board, and as to whether the certificates of the architect for such works are or are not *ultra vires*." Mr. J. H. Lile, in resuming the debate, attributed blame to the committee in allowing the architect to incur an extra expenditure of nearly 39,000l. without reference to the committee, but said he did not think there was any evidence to show that if the whole of the items of extra expenditure had been brought before the committee the expense could have been in any way reduced. Mr. J. Willmott and other members agreed that the Board had a substantial building, which was worth every shilling which had been spent upon it. Mr. Edward White, the chairman of the committee of inquiry, expressed the opinion that the architect was largely to blame in not consulting the committee as to the extra expenditure. He thought that such a thing was not likely to occur again. The amendment was lost by forty-four votes to five, and the recommendations of the committee were agreed to. Mr. J. Lobb called attention to a letter written by the Clerk to Mr. J. Brown, a member of the Board, in June, 1894, in which the hon. member was informed that a resolution passed by a sub-committee to the effect that certain bricks, of which Mr. Brown was the maker, might be supplied for use in the construction of the Brook Hospital, Shooter's Hill, in no way relieved Mr. Brown of the penalty which Section 14 of the Metropolitan Poor Law Act of 1867 imposed upon the managers, and which might be recovered at the suit of any common informer. He said that in consequence of the receipt of that letter, Mr. Brown requested the architect to omit all reference to the bricks in the specification, but, although that was done, certain bricks of which Mr. Brown was the maker had been used in the construction of the hospital.

He moved "That the whole matter be referred to the Local Government Board, to ascertain whether Section 14 of the Metropolitan Poor Law Act, 1867, has been contravened by Mr. Brown in supplying bricks used in the erection of the Brook Hospital." Mr. F. Purchase seconded the motion. Mr. J. Willmott said a dishonest attack had been made upon Mr. Brown. The bricks manufactured by that gentleman were purchased by merchants and builders all over the country, and, amongst others, by a firm of merchants in London, who supplied a comparatively small number to the builders of the Brook Hospital. Mr. Brown had no control over the merchants or builders, and the only way in which he could prevent such an occurrence was to give up his business entirely. Upon a show of hands, there voted:—For the motion, 5; against, 26. It was, therefore, declared to be lost.

BATTERSEA POLYTECHNIC.—A lecture on "The Home of the Future" Elizabeth's was delivered before the students of the building trade and other classes at the Battersea Polytechnic on the 9th inst., by Mr. J. A. Gotch. The lecturer dealt with his subject in a very able and interesting manner, illustrating his remarks by numerous lantern slides of Elizabethan architecture. The chair was taken by Mr. E. W. Mountford.

CAPITAL AND LABOUR.

THE BOLTON BUILDING TRADE.—The Bolton plasterers have sent in a demand for an advance in wages of 1d. per hour, which will bring them up to 10s. 6d. and the carpenters and joiners have submitted a number of alterations to the existing rules, which would mean an increase in the remuneration paid them, particularly in regard to what is known as "lodging money" when working out of town. The notices expire with the end of May, and so far both sides have apparently made up their minds for a fight. The difficulty in the brick-setting branch of the building trade is settled.—*Bolton Chronicle*.

SCARBOROUGH MASONS' WAGES AND HOURS.—Last September or October, the masons of Scarborough made application to the masters for an increase in their wages from and after April 1 next, of a penny an hour, and also for an alteration in the rules governing the hours of labour. The masons asked for the rate of pay to be 9d. instead of, as at present, 8d. an hour. The masters offered the operatives 8½d., which they accepted. The question of hours was deferred until the 4th inst., when another meeting took place and the men's demands were conceded. Commencing on April 1, the men will start work at half-past six the summer months instead of six, and work nine hours a day instead of nine and a half. In the winter months the men begin at seven and finish at five.

STRIKE OF INVERNESS PLASTERERS.—The plasterers of Inverness have come out on strike for an increase of wages. They were being paid at the rate of 7½d. per hour, and they demand an increase of 1d. per hour. The masters are willing to concede an increase of ½d. per hour; but the men have refused this advance. The men also desire the employers to sign certain rules drawn up by them; but the masters have declined.

BUNTON JOINERS' STRIKE.—The strike amongst the Buxton joiners has ended. They struck work for an advance of a halfpenny per hour on the old scale of 7½d., and for a scale of rules to be signed by the employers. The masters held a meeting, and offered to give an advance of a farthing per hour to come into operation on June 1, but this the men declined to accept. However, amicable terms were arranged, and it was decided that the farthing per hour advance should come into operation at once.

ABERDEEN PLASTERERS AND THEIR WAGES.—On the 10th inst. a meeting of the operative plasterers was held in the Trades' Hall, Aberdeen, for the purpose of considering the reply of the masters to the request of the men for an increase of 4d. per hour, to date from March 22. Mr. T. A. Coats, Secretary to the Masters' Association, wrote to the effect that the employers were agreeable either to adopt the decision of the Conciliation Board on the demands of the joiners, which are almost identical with those of the plasterers, or to submit the matter to special arbitration by the Board. Discussion followed the reading of this communication. The general feeling was that the plasterers' demands were entirely different from those of the joiners, and objection was taken to the matter being submitted to the Aberdeen Conciliation Board. In this connexion, the Secretary was requested to draw the attention of the employers to By-law No. 17, which states: "That all questions in dispute, including wages, shall be decided by a joint committee of the masters and men." He was instructed to intimate that the demands of the men were based on the fact that the scale of pay here is lower than in any of the towns in the south. In Aberdeen, the present rate of pay is 8d. per hour, while in Glasgow it is 9½d., in Edinburgh 9½d., and Dundee 9d. per hour.

LEGAL.

ALLEGED INFRINGEMENT OF ANCIENT LIGHTS IN TUDOR-STREET, E.C.

The case of the *Christian Herald* Company, Ltd., v. Knight and others, came before Mr. Justice Romer

in the Chancery Division of the High Court of Justice on the 11th inst., on a motion by the plaintiffs for an injunction to restrain the defendants from building so as to injure or obstruct the plaintiffs' lights at their offices in Tudor-street, E.C.

Mr. Ralph Neville, Q.C., and Mr. Sergeant appeared as Counsel for the plaintiffs; and Mr. Rowden for the defendants.

Mr. Rowden said he had only got the plaintiffs' affidavits the day before, and he asked for an adjournment in order to answer them.

Mr. Neville said he was willing to accede to an adjournment providing the defendant gave an undertaking.

Mr. Rowden replied that he could not give an undertaking, whereupon Mr. Neville asked permission to move *ex parte*. This being allowed, the learned counsel said that until the building now complained of was erected by the defendants the plaintiffs—strange as it might seem in London—had no obstruction to their light at all. For upwards of eight years the land opposite to them had been vacant, and before that time it was in the possession of a gas works.

Mr. Justice Romer: Are the lights in question ancient?

Mr. Neville said they were, and that the defendants proposed to raise a block of buildings to a height of 65 ft. His evidence was to the effect that what the defendants had already done was injurious, inasmuch as it had sensibly diminished the plaintiffs' light, and if the defendants proposed to go higher, the injury would be very great indeed. Plans were then put in, and after hearing the affidavit evidence his lordship granted an interim injunction restraining the defendants from erecting buildings from which so as to obstruct the light to six windows shown on the plan.

Order accordingly.

ACTION AGAINST BUILDERS:

IMPORTANT POINT.

On the 12th and 14th insts. the case of Bennett v. Castle & Sons came before the Court of Appeal, composed of Lords Justices A. L. Smith, Chitty, and Collins, on the appeal of the defendants to set aside the verdict at the trial before Mr. Justice Laurance and a common jury in the Queen's Bench Division last month, on the grounds of misdirection and that it was against the weight of evidence.

Mr. Montague Lush, in opening the case for the appellants, said the case raised questions of some importance to builders, and arose in the following circumstances:—The defendants, Messrs. Castle & Sons, were a firm of builders at Roehampton, and they were employed by the owner and occupier of a house at Putney Vale to do some building work in the beginning of September, 1896, on the premises of that work the defendants' men took some ladders on to the premises, and at the end of that day, after they had done their work, they put the ladders upon the lawn and in a place where they were perfectly safe. Mr. Titterden, the brother of the lady who was the owner and occupier of the house, told the defendants' men to remove them, and then by the edge of a path which led from the garden gate up to the back door of the house. The ladders were accordingly put there every night regularly from September 4, 1896, until November 24, when the accident happened. The ladders, which were tied together, were put against the edge of the path, right up against the ground. The ground was covered with grass. The plaintiff was a baker, and he admittedly went up this path from the garden gate to the back door of the house to deliver bread during the whole period of eleven weeks during which the ladders were there. The accident occurred between six and seven o'clock in the evening, which was the baker's usual time for delivering bread there, and his account was that he stumbled against the ladders and broke his thigh. He brought the present action against the defendants for alleged negligence in putting the ladders where they did, and the jury awarded him the sum of 50l. Mr. Justice Laurance gave judgment for him for that amount with costs. At the trial Mr. Griffiths, counsel for the defendants, submitted that the ladders were not liable as they had to put the ladders where they were by the orders of Mr. Titterden, acting for the occupier of the house. Mr. Justice Laurance, on the authority of *Corby v. Hill*, left it to the jury to say whether the builders did what they did by the orders of the occupier or by the permission of the occupier. The jury found that it was done by the permission of the occupier.

Mr. Lush submitted that there was no evidence to support the finding, and that the witnesses called by the defendants proved the order of the occupier. After a good deal of discussion, Lord Justice Smith, without calling upon Counsel for the respondent, in giving judgment said, as the jury had found that there was no contributory negligence, the verdict could not be attacked on that part of the case. The jury, having found that the ladders were put where they were by the defendants' men with the permission of the owner of the house or her agent, as distinguished from the order of the owner or her agent, the case came within the authority of *Corby v. Hill*, and his appeal must be dismissed.

The other Lords Justices concurred, and the appeal was dismissed with costs.

LONDON BUILDING ACT, 1894:
PUBLIC BUILDINGS—DISTRICT SURVEYORS' FEES.
At Southwark Police-court, on the 14th inst., Mr. Fenwick gave his decision in the case of *Picksee v. Bullers*. The plaintiff, Mr. Bernard Picksee, District Surveyor for East Newington, summoned Mr. J. Bullers, the builder employed, for 7l. 17s. 6d. District Surveyor's fees in respect of certain alterations made to St. Matthews Church, New Kent-road. The case was heard on January 26, when evidence was given by the plaintiff that the work done consisted of removing the old chancel floor and erecting a new chancel floor, supported on dwarf walls at a higher level than the old floor and extending some 9 ft. further into the body of the church; several pews being removed to make room for this. The new floor had seven steps up to the altar, instead of the previously existing three steps. There was no alteration to the walls or columns of the church, except that the bases of the small attached columns at the east end were taken out and refixed at a higher level. No building notice was in the first instance given by the defendant, though one was subsequently given when demanded by the District Surveyor. The District Surveyor surveyed the work from time to time until completion, when he issued his certificate under section 78. When, however, a demand was made for the fees, the defendant wrote to plaintiff that he was instructed by the owners not to pay.
It was contended by the District Surveyor, who appeared in person, that the work done came within sections 78 and 80 brought into operation by Sections 207 and 209, and that the work must be done as approved by him. It was argued by the counsel for defendant that the Act did not apply in this case, and the case of *Venour v. McDonnell* was quoted.
Mr. Fenwick, in giving his decision, said that he had come to the conclusion that the correct reading of the Act was, that for the Act to apply the work done must be "work affecting or likely to affect the building," as stated in the latter part of section 78; it, therefore, only remained for him to decide, as a fact, whether the work done was of such a character. For explanation he must refer to the earlier part of the Section, which read that "Every public building, including the walls, roofs, floors, galleries, and staircases shall be constructed in such manner as may be approved by the District Surveyor;" the question was, therefore, was this work that affected the construction of the floor of the church? He had heard the evidence and made a personal inspection of the building, and he further had an excellent plan of the alterations to guide him, and he could come to no other conclusion than that that it did, and, therefore, the District Surveyor was entitled to the fees.
Addressing the plaintiff, the Magistrate asked whether, having regard to his (plaintiff's) previous offer to accept less, he was still disposed to do so, and asked what amount was suggested. Plaintiff stated that no amount had been mentioned and he would prefer to leave the matter entirely in the Magistrate's hands. Upon the Magistrate pressing the plaintiff for his view of the amount he suggested one-half. The order was therefore made for 3l. 18s. 9d. and 3s. cost.

MEETINGS.
FRIDAY, MARCH 18.
Royal Institution.—Mr. James Mansergh on "The Bringing of Water to Birmingham from the Welsh Mountains," 9 p.m.
SATURDAY, MARCH 19.
Institution of Young Engineers.—Visit to Messrs. J. & E. Hall's Refrigerating Machinery Works, Darford. 3.30 p.m.
Sanitary Institute (Demonstration for Sanitary Officers).—Inspection at Harrison & Barber's Knacker Yard, Winthrop-street, Whitechapel. 3 p.m.
Perth Architectural Association.—Visit to Edinburgh.
MONDAY, MARCH 21.
Royal Institute of British Architects.—Mr. J. D. Grace on "Heraldic Drawing and its Adaptation," 8 p.m.
The Surveyors' Institution.—Mr. H. M. Grellier on "Tithes Rent Charge Recovery," 8 p.m.
Carpenters' Hall, London Wall (Free Lectures on Modern Connected Building).—Dr. G. E. Longstaff on "Municipal Control of Buildings," 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Osborne Smith on "Principles of Calculating Areas, Cubic Space, &c. Interpretation of Plans and Sections to Scale," 8 p.m.
Society of Arts (Concord Lectures).—Professor W. N. Hartley, F.R.S., on "The Thermo-chemistry of the Bessmer Process," 8 p.m.
Leeds and Yorkshire Architectural Society.—Election of officers; annual report. 7.30 p.m.
TUESDAY, MARCH 22.
Institution of Civil Engineers.—(1) Paper to be further discussed, "Calcium Carbide and Acetylene" by Mr. Henry Fowler; (2, time permitting), Mr. E. W. Stoney on "Extraordinary Floods in Southern India: their Causes, and Destructive Effects on Railway Works," 8 p.m.
WEDNESDAY, MARCH 23.
St. Paul's Ecclesiastical Society.—Mr. Hill Stephenson, F.S.A., on "The Brasses of Middlesex," 7.30 p.m.
Sanitary Institute.—Annual meeting, 5 p.m. Dinner to be held subsequently. (Demonstrations for Sanitary Officers.)—Inspection at the East London Waterworks, Lea Bridge. 3 p.m. Demonstration of Book-keeping as carried on in a Sanitary Inspector's Office. 7 p.m.

Perth Architectural Association.—Mr. F. D. Bedford on "Some Account of the Arts in Southern Italy and Sicily," 8 p.m.
THURSDAY, MARCH 24.
Institution of Electrical Engineers.—Mr. R. Hammond on "The Cost of Generation and Distribution of Electrical Energy," 8 p.m.
Society of Antiquaries.—8.30 p.m.
Royal Institution.—Professor J. A. Fleming, M.A., on "Recent Researches in Magnetism and Diamagnetism," 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Professor W. H. Corfield, M.A., on "Water Supply, Drinking Water, Pollution of Water," 8 p.m.
FRIDAY, MARCH 25.
Architectural Association.—Mr. T. C. Cunningham on "Constructional Steelwork," 7.30 p.m.
Royal Institution.—The Dean of Canterbury on "Canterbury Cathedral," 8 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. H. O. Eurich on "Internal Governor Friction," 8 p.m.
SATURDAY, MARCH 26.
Architectural Association.—Spring visit to Lord Windsor's house, Mount-Rose. 3 p.m.
Royal Institution.—Mr. Lionel Cust, M.A., on "Portraits as Historical Documents; Portraits as Monuments," 1.30 p.m.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.
Edinburgh Architectural Association.—Visit to the Museum of Science and Art, Chambers-street.
Perth Architectural Association.—Second visit to Congregational Church, Kinnoull-street. 2.30 p.m.

RECENT PATENTS:
ABSTRACTS OF ACCEPTED SPECIFICATIONS.
Open to opposition until April 3.
[1897] 6,328.—**VENTILATING OR AIR-EXHAUSTING APPARATUS.**—*A. Henstrom.*—The apparatus consists of two inverted funnels, one of which is placed on the end of the flue or up-take and the other concentrically above the same; twisted guiding lines, between the two funnels impart a rotary or cyclonic motion to the entering air, thus causing an up-draught.
6,096.—**WATER-CLOSETS AND THE LIKE.**—*R. B. Everett.*—The depression of the seat upon the closet is in use admits water into a closed air vessel, and the raising of the seat after use cuts off, by a counter-balance weight, the supply and discharges the contents of the vessel into the basin; to the seat is fixed an arm, moving the lever of a three-way cock, the passages of its plug being arranged to work with the raising and lowering of the seat; the apparatus may be worked by a footboard, and is applicable to urinals.
7,298.—**TREATMENT OF GYPSUM ROCK FOR ARTIFICIAL MARBLE, &c.**—*T. Parker.*—The invention's essential feature is the treatment of gypsum rock by dehydration, and chemical immersion, and to facilitate and hasten crystallisation; dehydration is accomplished by applying hot air at about 330 deg. Fahr. until moisture is eliminated, then the resultant hot calcium sulphate is removed into a closed compartment charged with fumes of ammonia, and the cool rock is next immersed in a warm solution of aluminium sulphate until the pores are filled, the colouring element being applied after the dehydration process.
7,999.—**DIE-LINED METAL PIPES.**—*A. Harralough.*—An inner tube or lining of tin is combined with the outer metallic pipe, and between these is inserted a section of cement or other non-conducting material; a wrapping of twine, asbestos, or yarn, keeps the inner pipe concentric with the other, and the inner pipe may be corrugated, so that if water is frozen therein it may expand instead of bursting.
8,078.—**KITCHEN RANGES.**—*G. F. Williamson.*—A fall-bar or table for the front bars of a range is placed vertically to cover the top of the front bars or to slide upwards and rotate into a horizontal position—the front fire-bars are connected to the fire-bricks, full height, and the drop-down table slides to the top of the top plate when it can be rotated horizontally; the fall-bar can also be made expandable for providing a larger table.
8,099.—**NOZZLES FOR SPRAYING, OR DISTRIBUTING LIQUIDS.**—*J. A. Watson.*—In this invention, which is particularly applicable for sprinkling lawns, the sprayer consists of (a) a circular casing having a round opening in the top, and (b) a hollow casting having at its upper end a cone-shaped tip which projects through the opening in the top of the casing, and at its lower end a coupling section for screwing it on to a hose or stand. The apex of the cone is perforated for the jets, a rotation chamber, formed between the cone's base and the top of the casing, gives a similar motion to the spray.
8,113.—**SAFETY APPLIANCES FOR CAGE LIFTS.**—*H. & E. Burgess and W. Bennett.*—To prevent the falling down of a mine cage if the winding rope should break, levers are mounted on fulcrums of the cage with one end of each encircling one of the guide ropes and the other end connected to a spring or weight; when the cage is moving under ordinary working the pull on the hauling rope is enough to hold the chains taut and to let the levers lie horizontally and free from the guide ropes, but when the winding rope slackens, the tension on the chains is relaxed, and then the spring pulls down the free ends of the levers, binding their opposite ends upon the guide ropes.
8,264.—**COAL-SAVERS FOR DOMESTIC FIRE-PLACES.**—*J. H. Cleetland.*—The device hangs upon the outer edge of the bars, and has vertical bars about an inch apart, and horizontal shell-like bars to fit over the range bars, which are kept cool by the flow of cold air through openings in the angle or edges of the horizontal bars; the contrivance may also be used as a range-front.
9,534.—**A DRAWING COMPASS.**—*J. W. Setten.*—To provide a grip for holding the pencil or its equivalent to cut or to draw, the inventor has constructed an open ended barrel or socket, a rotating set-screw, and a gripping plate; the screw, working within the barrel end of the compass's shorter leg, has at its inner end an adjustable ball, which presses against and holds the pencil.
9,549.—**TUNNEL-BORING MACHINERY.**—*G. Burt.*—The machine comprises (a) an arm having adjustable cutters, and mounted upon a shaft supported on a sliding table; (b) a shield, and adapted to be rotated by an electro-motor; (c) a frame mounted on the shaft, having buckets to take up the excavated material; and (d) a travelling belt or transporter for conveying the material back to a travelling platform above the trucks.

3,667.—**PRISM LIGHTS OR PLATES FOR WINDOWS, VAULTS, &c.**—*J. M. Egan.*—The lights are made of a single piece of thin transparent material, having on one side a series of parallel prisms so arranged as to produce an increased illuminating effect, and on the other side a series of similar convex projections, the convex surface of each projection being bounded by an arc of a circle, the arc of each projection joins or intersects the arcs of the adjacent projections, and the convex projections are parallel with the prisms.
29,478.—**AUTOMATIC CLOSING DEVICE FOR VESSELS CONTAINING THICK LIQUIDS.**—*O. Berthold.*—The device consists of a slide, actuated by a weight or spring; the slide is fixed to a lever pivoted to the sides of the outlet tube, and is carried down between two branches of the fork of the lever at its pivoted end, a weight on the lever's free end effects the closing of the outlet when the lever is left to itself, and an arrangement of cords and floats, actuated by the rise of the drawn-off liquid to the required height in the vessel, releases the lever to fall and to close the outlet.
[1898].—1,107.—**BOUNDARY AND SIGHTING STONE.**—*C. Branske.*—For trigonometrical mensuration or surveying operations the inventor provides a device by which the sighting rod may be readily and accurately set up; he builds a slit spring tube in the boundary, or sighting, stone, which holds the rod securely when inserted in the tube.
NEW APPLICATIONS.
For week ending March 5.
4,818, W. Keeble, a Filling and Self-cleaning Bath
4,843, W. J. Humber, Cleaning Windows, 4,850, M. J. Ryan, Door-holders, 4,855, H. Buchin, Land Surveyors' Cross-staff, 4,857, D. Delley, Rough-cutting Scales, 4,859, J. A. Bader, a Wrench, 4,860, J. Schumann, Heating Apparatus, 4,861-3, Diesel & Diekmann, Metallic Carbides, 4,865, F. W. Mitchell, Safety Lift Attachment, 4,870, Bingham & Capponing, Chilled and similar Castings, 4,884, F. C. Goddard, Washable Distemper, 4,891, C. R. McDaniel, Railway Gates, 4,897, W. A. McCoil, for Cold Drawing Metallic Tubes, Rods, &c., 4,907, E. Schuler & Benard, Lenses for Lighthouses, Projecting Apparatus, and the Like, 4,908, L. Rühl, Aërating Main or Town Water with Carbonic Acid, 4,915, J. Wein, jun., Ventilation of Towns, Sewers, and Enclosed Spaces, 4,916, L. Paget, Portable Electric Lamps and Batteries, 4,928, Nelson & Ulstrom Weather Bars and Draught Excluders for Doors, 4,950, Garrards, Screw-cutting and other Tools, 4,961, S. Skerritt, Self-closing Door Bar and Cold Saver, 4,964, S. E. Doughty, Fire Escapes, 4,968, W. Purcocks, Metallic Frames, Curbs, &c., 4,969, Morgan & Milward, Metallic Rulers, 4,973, S. W. Munford, Artists and Painters' Fiches and Handles, 4,980, W. S. Garland, Fuel or Coal Saver, 4,990, A. G. L. Flushing, Cisterns, 5,006, H. Bennik, Door Opening and Closing Devices, 5,016, A. Hamma, Road-cleaning Machines, 5,021, Pocock & Others, Water-closed Seats, 5,029, H. Masons, Filter Bed and Land Drain Tiles, 5,090, B. R. Gyppon, Strap Hinges, 5,102, C. A. Sadler, Hydraulic Jack, 5,105, J. Rothwell, Scales, 5,110, J. Easby, Earth Closets, 5,117, J. W. Sankey, Sheet Metal Baths, 5,118, A. J. Tenow, Producing Boards and the Like from Round Timber, 5,122, Rawlings, Automatic Flushing Cisterns, 5,124 and 5,124, Rose & Hall, Fire-escape Ladders, 5,138, M. J. Adams, and 5,154, G. Vedie, Water-closets, 5,142, C. P. Elmann, Tool Hangs Attachments, 5,148, G. D. Wansborough, to Clear Towns and Cities of Fog and Other Atmospheric Impurities, 5,164, A. Stehman, Boiling Size, 5,174, Rice & Higgins, Door and Window Fasteners, 5,194, Bonford & Others, Road Scarifiers, 5,218, Sackville & Swallow, and 5,413, N. Fensole, Copying Drawings, Plans, &c., 5,233, F. J. Bell, Water Wheels, 5,238, L. M. Watson, Method to Prevent Ladders from Slipping, 5,244, Pullan & Mann, Fire Bricks, Glazed Bricks, &c., 5,261, J. Walker, Chimney Pots and Ventilating Terminals, 5,266, D. D. Dr. Brass, 5,270, G. Wells, Collapsible Bins, 5,271, J. C. Rotherhithe, 5,284, Beyers, Crushing or Grinding Machine, 5,336, T. E. Barralet, Gas and Water Regulator for Geysers, 5,340, Fowler & Wilcox, Drain and Sewer Pipes, 5,341, F. Trier, Stone Dressing, Turning, and Moulding, 5,354, J. W. Meek, Smoke Consumption, 5,360, Smith & Others, Joiners' Clamp or Cramp, 5,375, J. Bassett, Plastering of Walls, Ceilings, Partitions, &c., 5,421, J. Goddard, Automatic Electric Switch for Holes and Cranes, 5,427, W. Cassels, Lavatories, 5,431, Holme & Wright, Joiners' Bench-Knife or Holding Device, 5,436, J. Somerville, Window Fastener, 5,441, T. Lees, Ore & Crushing Machines, 5,445, F. Mercereau, Fire-Lighter for Domestic or Industrial Purposes, 5,449, W. Duddell, Oscillographs, 5,469, J. P. Anney, Electric Traction, 5,472, J. Conrad, Earth Scoops, 5,486, Jennings & Gifford, Water-Closets and Urinals, 5,490, A. De Man, Fire-proof Doors and Frames, 5,494, V. Berrurier, Scaffolding Clips and Bands.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 2.—By RUTLEY, SON, & VINE,
Caledonian-rd.—4, Story-st., u.t. 40½ yds., g.t. 5½, e.t. 30l. 2,255
49, Freeling-st., u.t. 40½ yds., g.t. 5½, e.t. 30l. 320
12, Gifford-st., u.t. 40½ yds., g.t. 6½, e.t. 30l. 320
Rotherhithe.—16, Derrick-st., f., r. 16l. 230
Milton-next-Gravesend.—6, 7, and 8, East Milton, Oxford-st.—1, 2, and 3, Upper Rathbone-st., 1, 2, Tottenham Court-rd.—71, Grafton-st., f., r. 60l. 1,120
Regent's Park.—2, Albert-st., u.t. 21 yds., g.t. 12l., e.t. 80l. 455
149 and 144, Stanhope-st., r. 100l. also 100l. 1,405
f.t. 40½ yds., g.t. 4l. 1,405
47, Harrington-st., u.t. 39½ yds., g.t. 4l. 108, r. 45l. 635
12, Albany-st., and 18, Frederick-st., u.t. 24½ yds., g.t. 18l. 188, e.t. 130l. 1,010
Camden Town.—49, Crowndale-rd., u.t. 46 yds., g.t. 8l., e.t. 60l. 665

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Water Supply.....	Cricklade and Woolton Bassett L.D.C.	21/- and 10/- 10/-	April 20th 1924
*Technical School.....	Twinside Corp.	45/- 30/- and 20/-	May 20th 1924
*Rehearsal for Sewerage.....	West Leaze R.D.C.	100/- 50/- and 25/-	July 1st 1924
*Municipal Buildings.....	Godingham T.C.	50 Guineas	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered
Water Mains (3 miles).....	Edinburgh and District Water Trustees	J. & A. Leslie & Reid, C.E. 72a, George-st., Edinburgh	Mar. 21
Warehouse, Glen Moray Distillery, near Ruth	Beckenham U. D. Co., Willenden D.C.	C. C. Dalg. Archt. Elgin D. A. Angel, Council Office	do.
*Supply of Sulphate of Alumina	Watford U.D.C.	C. O. Robson, Office Dyname- road, Kilburn, N.W.	Mar. 22
*Plint and Granite Curb and Copes Two Houses, &c., Longleade, near Bath, near Haultain, &c.	Ravensthorpe U.D.C.	J. Kirk & Sons, Archt. Burdensdon	do.
Reinforcing Materials, Queen-street	Oldham Corp.	T. Manningham, Surveyor, Council's Office	do.
Reinforcing Materials, Union-street	Mr. Castle	W. M. Spence, Archt. Front-st., Ainslie Place ..	do.
House, Carlisle, near Annfield Plain, Durham	Mr. Macleod	J. Alcock, Survr. Keth Hall, N. Yorks.	do.
Three Shops, Commercial-st. Halifax	Lewisham E. of W.	George & Sons, Archt. Georgie-hall, N. Yorks.	do.
*Road Material	do.	W. M. Spence, Archt. Front-st., Ainslie Place ..	do.
*Works and Materials	do.	J. Lovegrove, Town Hall, Hackney	Mar. 23
*Asphalt Paving Work Concrete Paving and Repairs, Stone Paving	Hackney Vestry	T. J. Pritchett, Archt. George-square, Halifax ..	do.
Alterations to St. Mark Church, Ludlowden	Salford Corp.	Rev. W. Morgan, The Vicarage, Pontefrith	do.
Extension of National Schools, Pontefrith	Charmy Trustees	George & Sons, Archt. Georgie-hall, N. Yorks.	do.
Cost of Water Pipes, &c., St. Inverness, N.B. ....	.....	.....	do.
Institute, Bishop's Waltham, Hants .....	.....	.....	do.
*House Hire, &c. ....	.....	.....	do.
Water Mains, Rosemount	Perth C.C. (Eastern Dist. Water)	J. H. Anderson, J. Leslie, Dunfermline	Mar. 24
Two Houses, New lane, Lingworth .....	.....	.....	do.
Enlargement of Parish Church, Clontarf, Ireland .....	.....	.....	do.
Four Houses, West Wycombe, Bucks. ....	.....	.....	do.
Office, &c. ....	.....	.....	do.
Railway Line, Fort George, N.B. ....	.....	.....	do.
Residence, Dunfermline, Elgin, N.B. Two Houses, New York Park, Kirkcaldy, Levenale .....	.....	.....	do.
Printing Factory, Molebeck, Leeds .....	.....	.....	do.
Fire Brigade Station .....	.....	.....	do.
Cast Iron Socket Pipes (10 tons) .....	.....	.....	do.
Sunday School Buildings, Chap- el-End, Bradford .....	.....	.....	do.
Additions to Bridge Hotel, Lindrin don, W. Yorks. ....	.....	.....	do.
*Pollution and Court House .....	.....	.....	do.
Alterations to Chapel, Newry-street, Holyhead, N. Wales .....	.....	.....	do.
Bridge over River Yai .....	.....	.....	do.
Surveyor's Materials .....	.....	.....	do.
Swimming Bath, Ashdon Grammar School, Dunstable .....	.....	.....	do.
Cottage Houses, Tollymore Court Estate .....	.....	.....	do.
*Alterations at Infirmary and Con- structing Underground Carriers, Co. Wick, Wexford .....	.....	.....	do.
Reservoirs, Patchau Waterworks .....	.....	.....	do.
Whispering Railway Line, near Devon port, Devon .....	.....	.....	do.
Parish House, Greysoy Estate, Haver- fax .....	.....	.....	do.
Houses, Stahle, &c. ....	.....	.....	do.
Warehouse, &c., Hollins, near Darwen .....	.....	.....	do.
*Electric Lighting, Wirral, and Llandud- no .....	.....	.....	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be Delivered.
*Yorkshire Stone	Greenwich E. of W.	Offices, 141, Greenwich street, S.E.	Mar. 30
Cookery Centre, &c. Spon. street	Coventry St. Bd.,	G. and J. Steane, Archt. 22, Little St., Coventry	do.
Additions to Worsford Hospital, Leamington	Committee	J. Warren, The Hospital, Leamington	do.
*New Wing to Hospital	Worsford Hospital, Leamington	Secretary at Hospital	do.
*Building Materials and Tools	Prison Board	Prison Commission Office, Office, Caxton, S.W.	do.
Street Works, Bath and Luthall	J. W. Newombs	C. A. W.	Mar.
Setts, Kerbs, Paving, &c.	Middleton (Lancs.) Corp.	C. Cooke & Johnson, Archt. 35, Northampton street, W. Woburn, Dor. Surv.	do.
Additions to Hospital, Deane	Bolton Corp.	Borough Surv. Town Hall	do.
Additions to Holy Trinity Church, Bridlington Quay	Wokingham Union	J. V. Kingley, Market street, Bridlington Quay	do.
*Board House and Offices at Workhouse	Barry (Glouc.) Sch. Bd.	W. H. Gardner, Esq., chambers, Wokingham	April 2
Schools, Romilly-road	Llangollen County Sch.	G. Thomas, Surv. Queen's College, Bangor	April 4
*House	Dorsetshire County	H. T. Hine, 35, Parliament square, London	April 6
Quarrywork Extension, House, &c.	Kesteven County	G. H. Scott, Town Hall, H. R. Scott, Town Hall,	April 6
*Excavating and Foundation to Asylum	Hore U.D.C.	T. H. B. Heslop, County Surv., Norwich	April 7
Steel, &c. Bridge, Pimlico, near Ditchingham	Claypole R.D.C.	C. D. M. Trinder, Archt. Brougham, Newark	April 12
*Granite and Sillings	New Brighton Econo- mical Society, &c.	E. J. Hume, 10, High street, New Brighton	do.
*Bakery, Flour Store, and Shop	Directors of Callander and Oban Ry. Co.	Kent J. H. B. Barry, Kent, 21, Delabach street, West minster, S.W.	April 18
Railway Line (27 miles) Ballachulish	Relem (Para, Brazil) Municipal Adminis- tration	Brazilian Legation London R. Singer Byers, Strielow road, Wokingham	July 2
*Construction and Working of Cattle Pens, slaughter-house, two Markets and two Avenues	Chesham Union	Sharp & Walker, Surv. 32, Bradford-road, Brigh- ton	No date
Sinking Stone Shaft, Lower Green Farm, Brighouse	Brighouse Union	Smith & Tweedale, Archt. 19, South-parade, Leeds	do.
Three Shops, Bellvue-street, Flay, York	Flay Union	Hosker, Ralph, & Hosker, Archts. Kineton	do.
Additions to Church of St. Thomas, Golborne, Lancs.	St. Thomas Church, Golborne, Lancs.	Morris & Birch, Archt. 33, Canon-st. Aberdeen	do.
Practical School, Churchwell-street, Wales	Fark Hotel Co.	W. G. R. Sprague, Archt. Butterworth & Dwyer, Archts. street	do.
Trade and Hotel, Bedford	H. H. Moss	Strand, W.C.	do.
Cottage Homes, Middlewood, near Wardle	Rochdale Union	Archd. A. Booth-parade, Rochdale	do.
Villa, Castle Duncannon	Long Eaton, Notts	R. B. Ridgway, Archt. Burgess, & McCune, Archt. Burgess-street, Walsall	do.
Additions to Methodist Church, Chesham, near Walsall	Chesham Union	J. G. Richards, Archt. Norfolk-street, Peterborough	do.
Additions to School, Newnham, Lincs	Newnham Union	W. W. Robinson, Archt. Barns, Kelham	do.
Alterations to Business Premises, Bedford	Bedford Union	F. W. Dixon, Archt. Oldham	do.
Warehouse, &c. Row-street, Oldham	Oldham Union	Mr. Dent, Archt. Railway street, Nelson	do.
Eight Houses, Victoria-terrace, Brier- field, Lancs.	Brierfield Union	F. H. Archt., &c. Burn bridge-road, Bradford	do.
Houses, Stahle, &c. near Sheffield	Sheffield Union	Smith & Channingham, Aston, N.B.	do.
Boring Works, Dumfries	Dumfries Union	J. Hagger, Archt. North- ampton street, Glasgow	do.
Two Shops, Nine Houses, Fell Lane, Leighley	Leighley Union	F. Crawshaw, Dtd Surv. Lacey, near Sheffield	do.
Gravelly Site, &c. near Sheffield	Wortley R.D.C.	W. Moore, Archt. half-bridge Aston at Belfast	do.
Two Shops, Nine Houses, &c. New Donnell-road, Belfast	New Donnell-road, Belfast	do.	do.
Houses, Cedar avenue Belfast	do.	do.	do.
Shop, Station, &c. Kingsland-road and Broadway, Belfast	do.	do.	do.
Shop, Station, &c. Kingsland-road and Broadway, Belfast	do.	do.	do.
Shop, House, & New Hotel, Belfast	do.	do.	do.
Additions to Archdioc. House, Laurencetown, Co. Down	Rev. P. P. Campbell	J. J. McDonnell, Archt. 27, Chichester-st. Belfast	do.
*Tax Farming	Acton P.D.	D. J. McCall, 24, High street, Acton	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Architectural Assistant.....	Cardiff Corp.	21. 10s. per week	Mar. 22
*Two Assistants (Engineer's Dept.)....	Willenden D.C.	86s. rising to 176s.	Mar. 29
*Clerk of Works	Pontefract & D.C. ....	.....	April

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. & ix. Public Appointments, pp. xvii. & xix.

Kenish Town—35, Malden-rd., u.t. 47 yrs. g.t. 88, f. 58, g. 26.		Clapton—15, Prestbury-st., g.t. 261, f. 104, g. 104.		Bromley-by-Bow—Sarab-grove, f.g.r. 121 5/8, u.t. 48 yrs., g.t. 29.	
By BLAKE & DANNATT.		By NEWBORN, EDWARDS, & SHEPARD.		Minories—11, John-st., Corporation Lease, g.t. 88, f. 103, r. 17 1/2, 48.	
Plaintow—21, 23, and 25, Knaughton-rd., u.t. 86 yrs., g.t. 134, f.g.r. 130, g. 86, f. 86, g. 86.	£370	Islington—17, Linton-st., u.t. 294 yrs., g.t. 41 4/5, f. 361.	£250	Hackney-rd., 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.	£130
By ALFRED RICHARDS (at Tottenham).		By W. W. CLARK (at Driffield).		Thorlough, Yorks.—"Park House Farm," 201 a. 2 r. 0 p. f.	
Tottenham—226 and 228, Northumberland Pk., u.t. 100 yrs., g.t. 134, f. 80, g. 80.	£300	Southwark—243, Tabard-st., f. 301.	480	Two cottages—2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 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995, 996, 997, 998, 999, 1000.	£1,650
By ALFRED RICHARDS (at Tottenham).		By W. W. CLARK (at Driffield).		March 4.—By DRIVERS (of Holloway).	
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OMAGH.—Accepted for the erection of business premises, Market-street, for Messrs. Graham, Son & Wilson. Mr. W. Barker, architect, 7, Bridge-street, Omagh.—
Chas. McCrory, Omagh £1,750

PAULTON.—For the erection of Wesleyan schools. Mr. W. F. Bird, architect, Mid-oner Norton, Somerset.—
E. T. Hatherley £2,247 0
R. C. Cock 1,810 0
J. Ford & Son 2,027 10
H. A. Catley 1,690 0
J. Child 1,664 0
V. Keeling, Timbury 1,515 0
H. A. Sheppard 626 6
[Architect's estimate, £1,525]

PORTISHEAD.—For iron railings and gate at the new burial ground (Contract No. 3). Mr. T. J. Moss Flower, C.E., Carlton-chambers, Bristol.—
Allen, Son & Sons £2,504 5 0
Light Bros. £154 9 0
W. B. Brettell 184 47 0
S. H. Gibson 139 13 3
F. & R. Edbrooke 133 11 0
Priest & Son, Bristol 121 6 3
* Accepted with slight modifications.

PORTISHEAD.—For the erection of a combined entrance porch and shelter, boundary wall, &c., at the New Burial Ground (Contract No. 4), for the Urban District Council. Mr. T. J. Moss Flower, C.E., Carlton-chambers, Baldwin-street, Bristol.—
J. & T. Binns Bros. £2,665 10 0
C. Ellis & Sons, Portishead £572 0 0
* Accepted.

REDBRIDGE (Southampton).—For new factories, offices, &c., at Redbridge, near Southampton, for The Schuler Gunpowder Company, Limited. Messrs. Leeson & Bizard, architects and surveyors, Castle-lane, Southampton.—
H. Stevens & Co. £2,876 0 0
H. Carter 2,847 10 7
Thomas Rastbury 2,847 10 7
Jenkins & Son 9,835 0 0
Lymington 9,028 0 0
* Accepted.
[Architect's protecting estimate, £10,227.]

RICHMOND.—For alterations to 61 and 62, George-street, for The London & South Western Banking Company. Messrs. Edmonstone & Gabriel, architects, 25, Old Broad-street.—
Lawrence & Sons £1,067 0 0
Speechley & Smith £1,793 0 0
Brooking 1,897 0 0
* Accepted.

RICHMOND.—Accepted for additions to pavilion, for The Mid-Surrey Golf Club.—
Speechley & Smith £330

SALISBURY.—For the erection of two houses, Barnard street, for the Trustees of the Municipal Council. Messrs. J. Hard & Son, architects, 51, Canal, Salisbury.—
Wart & Way £750 0 0
Webb & Co. £2,876 0 0
W. & J. Day 2,847 10 7
S. G. Grant 889 10 0
P. Fryhorn £516 0 0
A. J. Matthews 550 0 0
C. W. Green 595 0 0
Vincent & Folland 640 0 0
F. Dibben (accepted) 550 0 0
[All of Salisbury.]

SANDERSTEAD.—For erecting a villa residence for Mr. F. Howard. Messrs. Treadwell & Martin, architects, 4, Waterloo-place, S.W. Quantities by Mr. H. Williams Mellor, 19, Craven-street, Strand, W.C.—
Gould & Son £1,774 0 0
Bulled & Co. £1,477 0 0
Gray 1,537 0 0
Henneman & Brown 1,440 0 0
Minter 1,587 0 0
Somerford & Son 1,554 0 0

SANDERSTEAD.—For erecting a villa residence for Mr. G. Young. Messrs. Treadwell & Martin, architects, 4, Waterloo-place, S.W. Quantities by Mr. H. Williams Mellor, 19, Craven-street, Strand, W.C.—
Gould & Son £2,513 0 0
Bulled & Co. £2,072 0 0
Gray 2,319 0 0
Henneman & Brown 2,043 0 0
Minter 2,529 0 0
Somerford & Son 2,446 0 0

SANDERSTEAD.—For erecting a villa residence for Mr. H. W. Higham. Messrs. Treadwell & Martin, architects, 4, Waterloo-place, S.W. Quantities by Mr. H. Williams Mellor, 19, Craven-street, Strand, W.C.—
Gould & Son £1,848 0 0
Bulled & Co. £1,539 0 0
Gray 1,552 0 0
Henneman & Brown 1,529 0 0
Minter 1,529 0 0
Somerford & Son 1,446 0 0

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P. D. T. D. Hayes, Stockport £19 18 0
Wm. Briscoe & Sons 124 7 0
* Accepted.

TREDEGAR (Mon.).—For the erection of County School buildings, for the Managers. Mr. W. S. Williams, architect, Tredegar.—
T. S. Ford £2,500 0 0
W. W. Wainwright £2,474 12 7
Mainwaring & Davies 2,595 15 0
Rees Edwards 2,395 0 0
D. Morgan 2,593 8 0
D. Vaughan 2,593 8 0
W. Williams 8,553 0 0
Tredegar 2,388 0 0
E. Morgan & Son 2,482 10 0
* Accepted.

UPPER WARRINGHAM (Surrey).—Accepted for additions to "Wootonga," for Mr. J. L. Travers, Mr. Hunty Gordon, architect, 123, Cannon-street.—
Speechley & Smith, Richmond £1,645

WINDSOR.—For alterations and additions to the "White Hart Hotel," Windsor, for Mr. J. C. Lake, Messrs. Treadwell & Martin, architects, 4, Waterloo-place, S.W. Quantities by Mr. H. Williams Mellor, 19, Craven-street, Strand, W.C.—
F. & H. P. Higgs £16,500 0 0
Mangle & Co. £16,000 0 0
Cooper & Son 15,398 10 0
Holls & Sons 15,390 0 0
Simpton & Sons 15,390 0 0
Watson, Ascot 15,190 0 0
Fitzma & Colman 15,158 0 0
* Accepted.

WORCESTER.—For the execution of water supply works, Clifton-on-Teme, for the Marley Rural District Council. Mr. F. Redman, C.E., Newport-street, Swindon. Quantities by the Engineer.—
A. Wills & Son £1,912 14 6
W. H. Smith & Son, Clifton, Bristol £1,200 8 5
C. Yarnold 1,587 6 6
T. Vale 1,587 6 6
* Accepted.

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L. LXXIV. No. 2877.

MARCH 26, 1898.

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Portal, St. Sauveur, Dinan.—Drawn by Mr. C. A. Nicholson	Single-Page Ink-Photo.
Churchyard Gateway, St. Jean du Doigt.—Drawn by Mr. C. A. Nicholson	Single-Page Ink-Photo.
Design for a Small Country Church.—By Mr. Hugh Macintosh	Double-Page Ink-Photo.
"Briarclough," Huddersfield.—Mr. Edgar Wood, Architect	Single-Page Photo-Litho.
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Parliament and Public Buildings.

W HILE our last issue was in course of printing, our legislators were in the course of a discussion, following upon a long statement by the First Commissioner of Works, in regard to public buildings proposed to be carried out, and the money to be voted for. In one respect the statement made a satisfactory nature. It appeared that the long delays and procrastinations in regard to the War Office building, the completion of the South Kensington Museum are at last to be ended, and that work is really to be done; and we may give the present Government, and a special Committee which they appointed under the Government Offices sites, the credit of having taken up the matter in earnest, and brought it to a result in the shape of a vote in favour of their schemes by a very large majority (265 to 15). It is satisfactory to find that there does not seem to be any intention to starve the new buildings by too much economy. 2,500,000*l.* is the sum demanded and asked for, to carry out the War Office, the new buildings on Great George-street site, and the completion of the South Kensington Museum. Of this, 800,000*l.* is appropriated to the last-named building, and we hope it augured from this that there is an intention to carry out Mr. Aston Webb's fine scheme pretty nearly as it stands, and not to reduce the museum a mere utilitarian shelter for objects of art. Of the complete sum of 2,500,000*l.*, it is promised that the War Office will eventually be got back by the sale of the sites now occupied by the War Office Department, which will then be

and the frequent promises of improvement which were never carried out. The history is familiar to most of our readers, and there is no occasion to make any further reference to it; but no doubt the First Commissioner, in asking for so large a sum of money, was wise in specially calling the attention of the House to the urgent necessity of the case, as far as regards the War Office at all events. It is noteworthy, too, that it is proposed to obtain the funds not by votes of the House as the money is required, but to proceed by Bill to provide the necessary expenses out of the Consolidated Fund. The advantages of this course were, as stated by the First Commissioner, that a scheme could be settled on from the first and proceeded with, the funds for it being available without having recourse to votes at recurring periods. The latter course, he observed, often led to difficulties. "The money available one year might not be forthcoming the next. A bad frost or bad weather might stop the work; the money voted the year before might not in consequence be all spent: the balance had to be handed back to the Treasury, and the money had to be re-voted in the course of the next year. Proceeding by Bill also enabled the Government to settle definitely the adoption of a scheme, and to remove it from the dangers of a change of policy, which had been so fatal to the building proposals of the Government in the past." He might well say so!

In regard to the War Office, it is obvious that the Government are determined on the Carrington House site, with all its disadvantages in regard to shape and limitation of area, and the First Commissioner evidently wished to reassure the House on this point by the statement that the site "contained an area of 75,000 square feet, which was more than was asked for by the authorities of the War Office, and which would therefore allow for any further expansion that might be required." Mr. Akers-Douglas, if his words are correctly reported in the *Times*, seems to have been under a little confusion in his mind between the idea of the area of the site and the area of the buildings which it is proposed to erect on it. The site, roughly calculating from the small block plan issued by the Office of

Works, contains about 99,000 square feet. The figure of 75,000 ft. must have been arrived at by taking the block plan of the building as shown on the Office of Works plan, and deducting the spaces left unbuild on. This is significant, because it is evident from this that the Office of Works authorities still hold to the intention of laying out the building with the small and inadequate internal courtyards shown on that plan. When a paper on the subject was read at the Institute of Architects last year, the reader of the paper produced a model which he had had made, showing the proportions of height to width which these courts would assume in a building the same height as the Home Office. That model is, we believe, still at the Institute, and a mere glance at it must be sufficient to show the cramped and insufficient nature of the site for the proposed buildings. This was so obvious that the Office of Works authorities immediately set up the reply that this block plan was only a tentative and rough scheme to show how the building might be arranged. We can only say that nothing was heard of this until after the reading of Mr. Statham's paper at the Institute, and the exhibition of the model, when it became evidently necessary to say something in excuse for such a plan. But we observe that the First Commissioner still sticks to his declaration that they have 75,000 square feet available for the War Office; and that can only be got by over-building the site, either in the way proposed in the Office of Works block plan, or in some other way. It is proposed to put more building on the site than is compatible with either the best architectural or the best sanitary results. The authorities may not believe us now; but they will believe us later on. They will find, when their proposed building is erected on that site, that they have a lofty building too closely crowded on the ground to produce the best results even for the present, and deficient in opportunity for further extension; and we are as certain of that as if we saw the building completed.

From the remarks of the First Commissioner in reply, after the discussion, we gather that the intention is, practically, for

the Office of Works to plan the buildings themselves, and then "to appoint an architect for the purpose of clothing the building." It would be impossible to imagine a more complete ignorance of what architectural design means than is implied in such a proposal. It is unnecessary to point out to our readers that the plan of a building is an integral part of the architectural conception, and that to make the plan first, and employ an architect to "clothe" it, is simply reducing architecture to the condition of a piece of external scenery. Whether the Government will find any architect of eminence ready to undertake such a part may be questioned.

The reason for this proposition is to be found in the exaggerated statements which were made by another speaker in the debate, Sir William Harcourt, in regard to the bad planning of the Home and Foreign Office. We have never defended this building; we do not think it a remarkable piece of architecture nor a well-arranged building internally. But it is not so absurdly bad in that respect as is pretended; and it should be remembered that the mission given to the architect was to make a sumptuous building, and to provide a grand set of reception-rooms; and the idea that something more than that was required in a business building did not arise in the minds of the clients themselves until the building was half finished. Then they found out that they had wanted something different, but they had never told their architect so in the first instance. Now, accordingly, it is assumed that no architect can plan such a building when he has the instructions as to what is wanted laid before him; and that it must be done for him by the Office of Works. As to Sir W. Harcourt's notions of architecture as an art we may get some idea from the fact that he cited Mr. Norman Shaw's Scotland Yard building as being no addition to the 'decoration of the Metropolis, and "inferior to Messrs. Crosse & Blackwell's establishment on the other side of the water." Some of these gentlemen appear to think that the fact of being a prominent partisan politician constitutes a man *ipso facto* a critic on art. Mr. Labouchere, indeed, is good enough to inform us, through the medium of the publication which is called *Truth*, that an artist is less fitted to form a sound opinion on such a point than others, "because his judgment is warped by technical trivialities," and that no architect at all events can be required for the new Parliament-street buildings, because "the exterior has only to correspond with that of the building on the right side of Whitehall, erected a few years ago": viz: the Home Office—the very building which they are all abusing: and the First Commissioner, the other day, as we have already observed, classed the new Admiralty buildings and the Scotland Yard building together on the same footing, as two structures not worthy of their position; the fact being that the Admiralty building is architecturally an absolute discredit to the nation, while the Scotland Yard building would probably be cited by a majority of architects and artists as the finest recent example of public architecture in London. What hope is there for public architecture in this country, when the management of it is to be subject to the opinions of politicians who cannot even perceive the difference between a building which is a work of art and one which is not?

ANCIENT AND MODERN INKS.

IT is frequently stated that since the mediæval ages the art of ink-making has shown decided signs of retrogression, and as evidence of this deplorable fact mention is made of certain documents written six to eight centuries ago which, when compared with many writings of less than a hundred years of age, show far greater legibility and a more perfect degree of preservation.

It is probable, however, that the inferior ink has come into use during the last few centuries, not so much through ignorance concerning the manufacture of more permanent ink, as through the desire to employ an ink which would not deteriorate by settlement, and which would, by more perfect fluidity, be more conducive to rapid writing than the ancient inks.

Vitruvius, Pliny, and Dioscorides each mention ink as containing soot or lamp black mixed with some mucilaginous fluid, and although even in their day a dye was also sometimes added, there appears to be little doubt that the legibility of ancient records is due to the use of carbon as the basis of the ink; and that when, towards the close of the mediæval period, the element carbon began to be discarded altogether as an ingredient of ink, the fading of manuscripts became more rapid.

Many years ago an ink receptacle was found at Herculaneum which contained a small quantity of ink. Upon examination this proved to be composed simply of lamp-black mixed with a thick oil, and it is supposed that this is the description of ink which was used for writing upon papyri at the time of the destruction of Herculaneum.

Such ink must have required frequent stirring, and the writing was probably performed with a fine brush. "The lamp black," says Underwood, "was ground up with the oil as painters' colours are now done, and by remembering this, we can understand the meaning of Demosthenes when, in a speech of his, he taunts his great rival, Æschines, for having been compelled in his youth, through poverty, to sweep the school, sponge the benches, and grind the ink."

The rapidity with which carbon settles out from the liquid in which it is suspended, and the poor fluidity of a mixture of carbon and mucilaginous liquid, prohibit its use for modern commercial purposes; there is evidence also that writers in the early centuries endeavoured to replace it by some more convenient substance, for Mr. Astle, the author of a book published towards the close of the last century, mentions that he possesses a parchment roll requesting prayers for the Countess of Oxford, who died in 1199; this roll contains certificates from many of the religious houses, flourishing in England at that time, and it is observed that whereas some of them are as black as if recently written, others are brown, and some of a yellow hue.

The extract of gall-nuts, or other tannin matter, in combination with an iron salt, which forms the basis of most black writing inks of the present day, was in use many centuries ago, but it appears to have at first been mixed with soot or lamp-black, which, however, seems to have gradually been discarded. The blue-black inks of the present day consist generally of this tannate or gallo-tannate of iron suspended in water

containing gum, and mixed with indigo, some similar colouring matter.

Coloured inks, consisting probably of soluble extracts, were known to the ancients. The Sacrum Encaustum was a purple and a green ink was reserved by the Greeks for State purposes. The coloured inks of to-day are frequently simple solutions of aniline dyes; but logwood and vegetable dyes are still used to a considerable extent. A somewhat remarkable fact of the present age is the preparation of a fireproof ink with a platinum for its basis, to be used in conjunction with a fireproof paper composed largely of asbestos.

Before leaving the subject of writing, mention must be made of the changes which have taken place in the manufacture of ink during modern times, for the quality of paper largely influences the permanency of the ink. The parchment skins which were formerly used for writing upon were superior to our modern paper, so that the preservation of the written record is secured; even the old unbleached paper is superior to the modern bleached and discoloured material, for small quantities of chlorine lime always remain in the paper, and apparently exert a detrimental effect upon paper and ink in the course of time, the result of using wood pulp for paper may already be seen in many books in which the paper has turned to a yellow colour, and become so brittle that it is broken into small pieces by merely turning it in the hand.

The ink in use at the present day by draughtsmen for drawing purposes appears to be very similar to that formerly used for ordinary writing purposes. In this country it is most commonly known as "Indian ink," although it appears to be most extensively manufactured in China, several factories preparing the ink being in existence in Shanghai and other parts of the Chinese Empire. To this day it is often used for writing ink in China, Japan, and other countries, a small brush taking the place of a pen.

This ink is merely a mixture of carbon, gum, with the addition of a small quantity of musk, or Borneo camphor, to give it a characteristic peculiar odour. But the preparation of this simple ink is by no means easy, for unless the materials are of the finest quality and the carbon as finely as it is possible to obtain it, an inferior result will result. At the same time, there are extraordinary properties about the Chinese ink, as Europeans have been unable to manufacture ink equal in quality to that which comes from the East; the chief drawback to European ink is that the European manufacturer is seized upon the first opportunity of obtaining cheaper raw materials, where the tendency of Chinamen is to remain *quo* throughout eternity.

After the carbon and gum have been mixed, the product has to be slowly and carefully dried. The moulding of the ink is effected in moulds engraved on the wood with Chinese characters, such as the known dragon, &c., and the gilding is formed with gold-leaf. The high price of the sticks is said to be produced by the fact that they are made with a hard brush impregnated with tree-wax. A good sample of Chinese Indian ink is fine-grained and homoge-

throughout, does not deteriorate with age and will produce lines of perfect regularity tint.

THE LONDON TELEPHONE SERVICE.

THE conference of Local Authorities held last week at the Guildhall, to discuss questions relating to the telephone service of London, was a complete success, and all the motions were carried unanimously. In order to understand what led up to this meeting we have to recall the recent unsuccessful appeal of the late Commission of Sewers to prevent the National Telephone Company from laying their wires underground in the City (though giving a definite promise of reducing their charges. Whilst the sympathies of nearly every one were with the Commissioners, yet there was considerable force in the National Telephone Company's story that it was hardly reasonable to complain about the efficiency of the telephone service, and yet to refuse underground lay-leaves to the company when they were doing their utmost to improve it. The real ground for the action of the Commissioners was, of course, that they did not feel justified in quietly giving a joint stock company leave to interfere with the City streets without any security for the interests of the public. These interests are secured by statute before permission is given to tramway and electric lighting undertakings, and it is manifestly not right that permission should be given to telephone companies unless under conditions which would protect the public.

After the failure of their attempt to prevent underground wires being laid by the company, the Corporation of the City of London wrote to ask the Treasury to hold an inquiry on the cost and efficiency of the telephone service in London. After some official correspondence, Mr. Hanbury finally replied that he regretted that the Treasury would not accept the authorities of the City speaking for the whole metropolitan area. The City Corporation then invited delegates from the various local boards and vestries in this area to the conference referred to above. The invitation was largely accepted, thirty-six out of the forty-one local boards sent delegates, and twenty-five of them estimated that they had also applied to the Treasury for an inquiry into the cost and efficiency of the telephone service in London.

The letter from Mr. J. S. Forbes, the President of the National Telephone Company, read at the meeting, admitted that the present service left much to be desired. He, however, attributed this solely to the fact that the Local Authorities in London did not give the company those reasonable facilities without which it was impossible to bring the service to its highest efficiency. We think this explanation very far-fetched. A much more probable explanation would be that the commercial policy pursued by the company in the past has been very short-sighted. As General Webber pointed out two or three years ago, at the Institution of Electrical Engineers, the haphazard system of extension adopted by the company has led to the deplorable result that London, considering its size, is the worst telephoned city in the world, and is not likely to be much improved in our lifetime. Mr. Forbes also laid great stress on the fact that the company was subject to a

Government tax of 10 per cent. on its gross receipts from exchange business, and to charges for way-leaves amounting to a very large annual sum.

We were sorry that the subject of long distance telephony was not considered more fully at the meeting. The recent enormous growth of this system makes it of national interest. Between many of our large towns, at the present moment, some three or four thousand conversations are averaged every day on the telephone, and as the great majority of these conversations are on matters relating to business, it will be seen what a great help the telephone can be made in facilitating commerce. The long-distance telephones are managed by the engineers of the Post Office, and the local telephones by the National Telephone Company, and although we have Mr. Preece's authority for saying that they work "hand and glove together," yet this is no great satisfaction on days when the local service is bad. Some people, too, think that it is hardly dignified for a Government department to place itself at the disposal of a private company.

While we fully recognise the shortcomings of the present London telephone service, we are yet compelled to admit that it is a great deal better than it was ten years ago. The London Corporation has never played a dog-in-the-manger policy, but is perfectly willing to grant permission to the Company to use the streets of the City on terms and conditions that would protect the public. The following motions, which were passed unanimously at the meeting, seem to us to give a very fair statement of the case and to indicate a line of action which will probably prove beneficial to the many users of telephones, and ultimately also to the shareholders of the National Telephone Company.

"1. That in the opinion of this conference of Delegates representing the Corporation of London, and the Vestries and Local Boards in the metropolis, the present telephone service in London is both inefficient and costly.

2. That in the opinion of this Conference an inquiry should be held by the Treasury as to the cost and efficiency of the London Telephone Service, and all matters relating thereto, agreeably to the request of the Local Authorities of London.

3. That copies of the foregoing resolutions be forwarded to the Treasury, the Corporation of London, the London County Council, and the Vestries and Local Boards of the metropolis."

NOTES.

Elementary Education.

An interesting and useful debate took place in the House of Commons on Wednesday last on the subject of elementary education. It was based on a motion of Sir John Lubbock's, to the effect that three class subjects should be permitted to be taken up. At present there are what are called four class subjects, namely, geography, elementary science, English, and history. In the English schools only two of these may be taken up, but in Scotland three is the permitted number. The chief interest of the debate arose from the fact that there was a general agreement that elementary education in England was behind that of Scotland and Continental countries, and that one difficulty in the way of better education was the religious difficulty.

With that we have nothing to do in these columns, but there can be no doubt that every effort should be made to bring up the elementary education of the country to a higher level, since upon it must be based any satisfactory system of secondary and technical education. As regards the motion before the House of Commons, it received no practical answer; for the permission to scholars to take up three subjects does not oblige them to do so. It would be possible in schools of high class to take up three subjects, while those of lesser capacity would keep, as at present, to two subjects. The great thing to be aimed at is to allow scholars as much freedom of choice as possible.

Calcium Carbide and Acetylene.

A PAPER on this subject was read before the Institution of Civil Engineers, on the 15th inst., by Mr. Henry Fowler. The author stated that acetylene gave the most brilliant light of all gases. Under suitable conditions 5 cubic feet gave 240-candle power, but for small consumptions this value was not obtained, and ordinary burners became clogged with soot. This latter defect could be overcome by the use of an injector burner, which, however, required a higher pressure. The highest value of acetylene, burning one cubic foot per hour, was forty candles. Numberless devices, said Mr. Fowler, had been invented for generating acetylene, but its application was more dependent upon its cost than upon the apparatus used in its manufacture. Acetylene has been used for lighting at the Salford Docks of the Manchester Ship Canal, and for lighting a station on the Great Southern and Western Railway of Ireland. The acetylene flame has a high actinic value, and causes light colours to appear lighter and dark colour darker than when exposed to sunlight. The gas, when inhaled, causes suffocation, but has been shown to be no more dangerous in this respect than coal gas. Calcium carbide has now been reduced to 16s. per ton when sold in quantity, and at this price acetylene can compete with coal gas at 2s. 6d. per 1,000 cubic feet when a light of not less than thirty candles is required, and the comparison is made with coal gas burning through ordinary flat flame burners.

Insurance, and the Workmen's Compensation Act.

IN a paper which was read on March 17 before the Insurance Association of Manchester, by Mr. C. H. Green, Assistant Secretary of the Sun Life Assurance Society, the relative merits of mutual societies of employers for their protection, and of insuring with insurance companies, are considered. It need hardly be said that Mr. Green makes out a good case in favour of doing business with the companies. We are inclined to think that employers will find this method the best, more especially as it appears from Mr. Green's paper that there is already considerable competition among insurance companies for this new class of business. Moreover, there is always this to be said, that if employers think that they can improve their position by combining in mutual protection societies they can always do so, and this possibility will tend to prevent the rates of premiums from rising too high. No class of business men are more alive to the needs of the times than are managers of insurance companies

and we may shortly expect to see the rates of premiums published.

The Henley
Railway.

THE Bill for the proposed railway from Marlow to Henley-on-Thames will not be proceeded with. This announcement our readers are probably already acquainted with. But the terms in which the General Manager of the Great Western Railway made the decision of the Directors public showed a singular want of appreciation of what we believe is the public feeling in regard to the Thames Valley. The latter has now become—if we may use the expression of a river and its surroundings—one of the playgrounds of England. It is as necessary that it should be kept free from invasion by a railway as if it were a common. Railways, no doubt, will have to tap it, but they must be so constructed as to keep out of the valley except at the point of termination. Moreover, it is obvious that the officials of the Great Western Railway were anxious to make the river at Henley easily accessible, so that excursionists might be brought there. It is certain that nothing would so much depreciate the value of property in the Thames Valley as railways which enabled masses of people to be poured into it for day excursions. It is not, and never can be, a holiday resort, like a seaside place; what property owners desire is that it should be essentially a residential neighbourhood. This implies that it is sufficiently easy of access to those who are able to enjoy the Thames in an intelligent and quiet manner. The excursion steamers which from time to time during the summer are encountered are a sufficient warning as to what the valley would be if excursion trains poured their hundreds on to the banks of the Thames.

Albert-gate,
Knightsbridge.

It is stated that the French Government have bought for 25,000*l.* the house, on the gate's east side, which during many years past has been the French Embassy. That house and the one on the west side of the gate were built by Thomas Cubitt; the eastern house was purchased from him for 15,000*l.* by George Hudson, the "Railway King," who died twenty-seven years ago. They stand on the sites of the Cannon Brewery and the "Fox and Bull," originally the "Fox," tavern. The sign of the latter, blown down in 1807, is said to have been painted by Sir Joshua Reynolds. The ground was bought by the Crown of the Dean and Chapter of Westminster; on April 6, 1842, the road was made into the Park; the gates were erected in 1845. The piers carry two stags, modelled after prints by Bartolozzi, and formerly at the Ranger's Lodge, Green Park, designed by Robert Adam, 1768, and pulled down in 1820. It is said, too, that the French Government will acquire the houses that stand between the Embassy and Holy Trinity Church, and build a ballroom, a banqueting-room, and other additions to the present house. The church, designed by Brandon & Eyton, occupies the site of a district chapel rebuilt in 1699, which has been the hospital chapel of a lazaret-house appertaining to St. Peter's Convent, Westminster. The hospital chapel was converted by Laud, when Bishop of London, into a chapel-of-ease to the parish of St. Martin-in-the-Fields, within which it was then situated. In July, 1766,

John Rhodes published his survey of Kensington, &c., made to an unusually large scale, and engraved by George Bickham, giving an interesting view of the ground.

Sewer
Ventilation.

The ventilation of sewers by means of inlet-grates at the street level and high extract-shafts has been advocated for many years, and now appears a pamphlet entitled, "The Sanitary Problem from the Sewer-gas Point of View," which gives the results of tests on two systems of sewerage "ventilated" on this principle, and which is intended to prove that this method of ventilation is a farce. The tests were made at Fulham by Mr. J. P. Norrington, A.M.Inst.C.E., and at Sutton (Surrey) by Mr. A. D. Greatorex, A.M.Inst.C.E., and certainly show that at these places the inlets as often as not act as outlets, while the shafts act sometimes as inlets, at other times as feeble outlets, and again are of no service either way. The subject is certainly a difficult one, as the direction of the air-currents is influenced, not only by the motion of the sewage, the direction and force of the wind, and the difference in temperature between the air of the sewer and the external air, but also (and this important factor is not considered in the tests now referred to) by the hygrometric condition of the air within and without the sewer. The pamphlet has been written and compiled by a gentleman interested in a process for rendering "sewage in transit inodorous and innocuous," and thus removing the necessity for high ventilating shafts—a most laudable object, and one which, we may hope, will one day be realised. But when we think of other patentees who have made similar claims, we must suspend our judgment for the present on this new process.

Proposed
Improvements
at Leeds.

We learn that there is talk of building new Law Courts for Leeds, the courts in the Town Hall being insufficiently provided with accessory departments and waiting space, while the space they now occupy is much wanted for more accommodation in connexion with the municipal work of the Town Hall. We are also glad to see, in an article in the *Leeds Mercury*, a strong expression of opinion in regard to the wretched and unworthy surroundings of the Town Hall. "Standing in the square," says the Leeds paper, "we have on one side a triumph of modern architecture; on the other there has been allowed to remain what would discredit many a colliery village." We drew special attention to this point in our article on Leeds in the *Builder* of December 19, 1896; and we are glad to see that the inhabitants of the town are beginning to realise that something ought to be done.

Sanitary
Condition of
Lancaster.

FROM Dr. Theodore Thomson's report to the Local Government Board on epidemic measles in the borough of Lancaster, it appears that in this case the origin of the disease cannot, as in the majority of localities reported on, be traced to any definite insanitary condition of the town, though this is not all that could be desired. Dr. Thomson says:—

"The town may be regarded as consisting of an older portion, which lies around and at the base of the eminence on which Lancaster Castle stands, and of a newer portion spreading from the older on all sides, but extending more especially in a southerly

direction. The older portion of the town shows not a few instances of houses huddled together in a fashion depriving them of proper light and air-space; while the back streets and yards are often indifferently paved, and less clean than is desirable. In the newer parts of Lancaster, on the other hand, the above conditions—air-space, light, paving, and cleanliness—are distinctly superior to those in the older parts of the town. Working-class houses in newer Lancaster have usually two rooms and scullery on the ground floor, and two or three bedrooms on the upper floor; in older Lancaster accommodation in houses of this class is scanty. The prevailing system of excrement disposal is by water-carriage, the town being sewered throughout. House refuse is stored in brick ashpits, and is removed periodically by the Town Council Sanitary Authority. The town has a public water supply, derived, it is said, from the Millstone Grit of Wyre Fell, some nine miles from Lancaster."

St. George's
Church,
Botolph-lane.

STEPS have been taken, under the Union of Benefices Acts, for uniting the parishes of St. George and St. Mary-at-Hill, and for pulling down the church of the former. A report upon the fabric was made in pursuance of the City of London Parochial Charities Act (46-7 Vict., c. 36) for the Charity Commissioners by the late Ewan Christian, who advised that 2,700*l.* would be necessary for its restoration, and the church has since been closed. It was built by Wren in 1673-4, at a cost of 4,599*l.*, and presents some striking characteristics of his City churches—a well-proportioned tower, 16 ft. square at base, rising from the ground, in three stages, to a total height of about 85 ft., and having a cornice and a dead-pannelled parapet with angle-piers capped with vase-shaped pinnacles. In the lowermost stage is the door; the second stage has a round-headed window beneath a square cornice, square openings, with louvres, pierce the belfry-stage. The church's east end has a central angle-pediment, the basement story is unbroken by either doorway or window; Corinthian columns, two on each side, widely-spaced, divide the nave from the aisles. The church, which was repaired in 1836 and in 1884, measures 54 ft. by 36 ft. and is 36 ft. high. On the sword-iron was affixed a plate inscribed to the memory of William Beckford, twice Lord Mayor of London, who died June 21, 1770. At the Dissolution the rectory passed from Bermondsey Abbey to the Crown; since the Great Fire the parish has been united with that of St. Botolph Billingsgate. The neighbouring church of St. Mary-at-Hill was reinstated at a cost of 3,980*l.* by Wren, who repaired the tower and walls. Much of the fabric was rebuilt of brick, circa 1775, but Wren's east front remains. The interior, which had four Italian Doric columns, and cupola, was remodelled by James Savage, who also built the rectory-house: 1848-9. Five years ago a large quantity of human remains were removed from the vaults and re-interred in Norwood Cemetery.

Saint Pierre,
Montmartre.

THE "Vieux Paris" Committee is occupied at present about the ancient church of Saint Pierre, Montmartre, the restoration of which has been put into the hands of M. Sauvageot, Architect to the Commission des Monuments Historiques. The result of the architect's investigations, so far, is that the apse and the other portions of the edifice date from the twelfth century, but that the small chapels of the apse have been built on the

structures of a more ancient church. The vestige of the Roman temple of Mercury, which is known to have once occupied the site, has been found, beyond the existing four marble columns, of which two are built into the piers of the apse, and two others placed against the first piers of the nave. Further investigations are to be systematically made during the work of reparation. It is to be feared, however, that whatever the "Commission" may discover, they will not leave much of the ancient church of Saint Pierre, if we are to judge by the manner in which they have "repaired" other ancient monuments in France.

WE have not had an opportunity of seeing Mr. Sargent's portrait of the last President of the Institute of Architects in such a light as to judge of its colour effect, but there can be no doubt that as a piece of characterisation in portraiture it is a remarkable success, and is one of the best in the series of portraits of its Presidents which the Institute possesses. It has always been an evident object with Mr. Sargent, in his portraits, to lay hold of some characteristic attitude or expression in his sitter, and make that the keynote of the picture, and in some cases he has exaggerated this tendency in too dramatic a manner; but with Mr. Penrose he has been very successful; he has caught the ex-President's larger and alert look in listening to the discussion of some point of interest to him, and has produced an exceedingly real and living likeness. We may take the opportunity of pointing out that the subscriptions hitherto received do not cover the exceedingly moderate price which Mr. Sargent has asked for his work, and the Secretary would be glad to hear from any members who are disposed to add their names to the list.

MR. CRACE, in his paper on the ancient Use of Heraldry, at the Institute, has instanced the cartouches of the Egyptian kings as samples of excellent drawings of a heraldic character. But he omitted to point out that these cartouches were not heraldic in intention, in the sense that our badges are. They were parallel in their use, their sigillographic general form, and in the ideographic nature of their component characters, to the "nien-hao" of ancient China and of Japan, and in the last respect only do they resemble our heraldic badges. It is, perhaps, in their use that the greatest distinction is noticeable; they were, like the "nien-hao," not intended to be worn upon the person. This wearing upon the person is (or was while heraldry remained a living and necessary science) a vital feature distinguishing heraldic bearings from every other sort of device. The systematic use of personal badges and distinctive crests existed (with perhaps a few isolated exceptions) only among those people who habitually wore closed helmets; it was originated for the purely utilitarian purpose of labelling its wearer. The word "crest" is, of course, here used in the heraldic sense only. It may be remarked here that in Japan, the only eastern country where men of rank are thought in vizzed helmets, the use of personal crests and badges developed into a general and officially recognised system, just as in Europe, and the principle of simple and

expressive drawing insisted on by Mr. Crace was always observed.

The Vienna Exhibition.

PREPARATIONS for the Jubilee Exhibition at Vienna are busily advancing. It is to be opened on May 7. There are more than a hundred buildings, great and small, each apparently being designed by a different architect. Thus we have the "Pavilion of the Town of Vienna" (Drexler Brothers architects); that of the Commission of Commerce (von Förster); of the Government of Bosnia and Herzegovina, in the Oriental style, prominent in appearance and colour; the Bakery Exhibition, in German Renaissance, with arcades, &c. (Fellner and Helmer); and many others too numerous to mention. At each corner are to be great crystal "Jubilee pillars," which at night are to be lit with electric lights placed inside them.

Jumbomania at the Paris Exhibition.

PROFESSOR JAN ZAWIESZKI, the architect to the theatre at Cracow, has perhaps reached the *ultima Thule* of extravagance, even in a design for a Paris Exhibition. He proposes, at the Exhibition of 1900, to have a great spherical iron building, 100 metres high, completely swathed in masses of water falling from the top. It is to be in three orders—Tuscan, Renaissance (whatever that may be), and Ionic. Though the whole of the outside is to be surrounded with water, the inside is to be quite dry, so that visitors wander at their will without the fear of wet feet. We do not gather from the published description how, in entering the palace, they are to get through the wall of water without being wet through. Inside is to be a theatre of varieties, the inevitable restaurant, the equally inevitable big wheel, and a dancing saloon. At night the falling water is to be illuminated with coloured lights, which will, no doubt, be very effective.

Cast Iron.

A PAPER is to be read at the Society of Antiquaries on May 12, entitled "Sussex Castings," to prove that the rediscovery of the process, supposing the ancient Greeks were actually acquainted with it, was made in Sussex. The cast iron industry seems again coming into favour, and is to be well represented at the Art Metal Work Exhibition; the Coalbrookdale, the Carron, the Falkirk, and other notable firms having taken spaces. This is very well as long as people will comprehend and bear in mind the character and the limitations of cast iron in regard to artistic treatment, and not attempt ornamental design of a kind which cannot possibly be done justice to in cast work.

Cheap Statues for Beverley Minster.

THE Suffragan Bishop of Beverley writes an amusing letter in the *Times* of Wednesday, recounting the good feeling of the inhabitants of Beverley, Massachusetts, in subscribing the price of two of the modern-mediaeval statues which are being affixed to Beverley Minster. The sum, it appears, for which two statues are produced is 35*l*. Whether vacant niches in a mediaeval building should be provided with modern statues is an open question; it depends to some extent on circumstances; but there can be no doubt that if it is done, the statues should be the

work of the best sculptor's art of the day, only assimilated in line and general style into a certain harmony with the mediaeval architecture. But we should like to know what kind of statues are being put up on Beverley Minster at 35*l*. a pair? The price tells a tale. They must be executed and charged, we should imagine, as mason's work: or perhaps they are made by machinery. At all events, it is impossible that the hand of an artist can be in them—unless the artist is being drastically plundered.

East Ham Public Offices Competition.

WE observe that the District Council of East Ham advertise a competition for new public offices, with liberal premiums attached to it, but with the intimation that "the Council will probably be advised by a professional referee in the selection of the plans." Why "probably"? Surely that is a point on which they can make up their minds, and ought to do so, if they wish competitors to have confidence in them. Architects are not likely to give their time to a large work like this on the strength of the statement that there will "probably" be a professional assessor; a phrase which may mean nothing whatever, and leaves the Council at full liberty to act without an assessor if they choose.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

HERALDIC DRAWING AND ITS ADAPTATION.

A MEETING of this Institute was held on Monday, at No. 9, Conduit-street, Regent-street, the President, Professor Aitchison, R.A., occupying the chair.

The minutes of the last meeting were taken as read, and the Earl of Stamford having been introduced to the meeting,

Mr. Woodward inquired whether any communications had passed between the Council of the Institute and Her Majesty's Office of Works with reference to the designs for new Government offices in Whitehall?

The Chairman replied that the matter was wholly confidential, and he was therefore unable to give information on the subject.

On Mr. Woodward requesting that a note of the communications which had passed should be published in the next issue of the "Journal," the Chairman observed that it was hardly in the power of the Council to do so.

Portrait of Mr. Penrose.

The Chairman said he would call upon their distinguished Honorary Associate, Mr. Alma Tadema, who was so well known, not only to that assembly, but to England and to the world, to unveil the portrait of their past President. They had had the good fortune to get Mr. Sargent to undertake to paint the portrait, and it was one of the very finest works that the Institute possessed, although they could boast of the works of the late Mr. J. P. Knight, Mr. Boxall, Mr. Frank Holl, Mr. George Richmond, Mr. Phillip, Mr. Oules, Mr. Orchardson, and Mr. Alma Tadema himself, who did them the honour of painting one of their Presidents.

Mr. Alma Tadema said he considered it a great privilege to be called upon to unveil the portrait of a man whom he esteemed so highly, painted by another whom he did not esteem less. He had taken the liberty, and he should continue to do so, of calling Mr. Penrose "our Athenian." Mr. Penrose had pointed out that there was life in the straight lines of Greek architecture, and it was appropriate that his portrait should be painted by a painter who shewed us that there was life in the lines of the brush.

Mr. Tadema then unveiled the portrait of Mr. Penrose.

The Chairman said that it was his duty to say a few words about their past President. He was one of those men who had conferred dignity on their art, not only by his talent and knowledge, and the advances he had made in the theory of architecture, but also by his extreme devotion to the great

science of astronomy. Plato, in one of his dialogues, complained of architects as people who falsified realities; that instead of making the lines of things as they ought to be, they infused all sorts of delicate soft curves, which took them out of the category of realities. However, not being a philosopher he could only say that he was extremely thankful to those delicate sensibilities that the Greeks displayed, making things so exquisite that the Parthenon was like one of the works of nature, which one could look on for ever without getting satiated or disgusted. There were passages in Vitruvius which had bothered all the annotators since the time when the codex was re-discovered till the time of Wilkins, the great architect who built the National Gallery Uiver. Coll. and so many other fine buildings in this country. Before his time none of the annotators had the least idea of what Vitruvius meant. Guliani had an idea that the curves were made to bulge outwards. Mr. Wilkins had read the passage aright, that it had been observed by the Greeks that long straight lines when looked at from above were hollow, and that when they were above the eye, they looked as if they sank in the middle. Wilkins, with an honesty which was perhaps not common in a discoverer, remarked that he had examined all the principal buildings of antiquity, but he had never observed this curvature. The fact was that all the straight lines in the Parthenon—all the lower lines—were encumbered with ruins; and Pennethorne, who was a great authority on architecture, happened to be at Athens shortly after this discovery of Wilkins, and the stylobate and the steps, being less encumbered than they had been before with fragments, set to work, with the small appliances he had at his disposal, to see whether these theories of Vitruvius were borne out by the facts, and he found they were. But he neither had suitable instruments nor was the whole place clear. There was a great controversy about this, and Mr. Penrose offered to go, and the Dilettante Society, to whom they owed so much for publishing works on Greek architecture, furnished him with the means of going out with his instruments; and with his knowledge of architecture, and with his mathematical attainments, he showed for all time that these delicate curves, and all these peculiar variations which make the Parthenon so beautiful to look on, existed. It was mentioned in the newspapers that Dr. Gallon stated—he did not know on what ground he based the opinion—that he believed the Greeks were as superior to the present inhabitants of Europe as the inhabitants of Europe were to the negro. Be that as it might, Vitruvius said that the sense of hearing amongst the Romans was much less acute than that of the Greeks, and that they were obliged to use Greek terms, because many of those variations in music were so slight that they could not be appreciated by Roman ears. He did not know a more eloquent description of the buildings at Athens than that given by Ernest Renan. He went out there, and said that he had often heard and read and dreamed of perfection, but he never saw it until he went to Athens. That showed that one of the great literary men of the day was capable of judging of the extreme elegance, carried to the last pitch of refinement, which the Greeks were enabled to reveal. They would all be glad to have amongst this excellent collection of pictures the fine work of Mr. Sargent. He was sure that everybody must be grateful to him for giving so admirable and striking a portrait of their late President, with all those refinements which so marked the man of science and the man of art.

Mr. Sargent having briefly returned thanks, a vote of thanks was accorded to Mr. Alma Tadema for unveiling the portrait.

Mr. Woodward remarked that Mr. Pennethorne, so closely identified with the discovery of the optical refinements in Greek architecture, was Mr. John Pennethorne, the brother of the architect, Mr. James Pennethorne.

Mr. J. D. Crace then read a paper, entitled "Heraldic Drawing and its Adaptation," of which the following is an abstract:—

Mr. Crace said that in the drawing of heraldic devices, one leading principle applied—the necessity of recognising what has to be said, and how to say it simply and directly. The heraldic device was intended to appeal, not to the sensibilities or emotions, but to a simple intelligence, to be rapidly understood. The eagles, lions, roses, or fleurs-de-lis of heraldry were not to be thought of as pictorial illustrations of the animal or vegetable creation, but

as symbols. The conventional or symbolic representation of the heraldic "charge" conveyed certain limited information at a glance. Heraldry had been described as "out of date," "antiquated nonsense," but modern equivalents for the heraldic "ordinaries" might easily be found. The effigies painted on tavern signboards showed at once the name and purpose of the house; the colours of the jockey's jacket conveyed distinct information; flags, whether for signalling or for distinction, were heraldic. The lecturer cited instances of the ease with which facts about people dead centuries ago could be learned from the heraldry displayed on relics associated with them which had come down to the present day. In decorative heraldry, whether architectural or other, extreme clearness of expression is required; the more so that frequently the examples are distant from the eye, or in positions where other forms more important to the composition must be so rendered as to claim the first attention. The details have also sometimes to conform to cramped and difficult spaces.

Allusion was made by the lecturer to the close relationship between the symbolic design of heraldic charges, and the less direct forms used in expressing ideas by writing. Looking back to the remote times of Egyptian art, each of the kings and queens of the various dynasties could be distinguished by the "cartouche" bearing the symbols of that sovereign. That "cartouche," repeated on the cornice of a temple, was almost as heraldic as the shield repeated on the cresting of an English monument, and its object was virtually identical. The animal devices used as symbols on Egyptian monuments of 3,000 years ago had never been surpassed, and should be well studied by the heraldic draughtsman. Though used to convey the sense of words or sounds, they were also used to convey certain information even when writing came into general use. For monumental purposes the well-recognised symbol conveyed the idea more promptly. It is of primary importance that the object representing the idea should be so drawn as to be promptly recognised; and the art of conventionalism is the art of selecting the most characteristic points, leaving details to be filled in or not, according to circumstances.

Having shown under what conditions it was permissible to multiply or omit details, and when "naturalism" or fanciful treatment might be indulged in, provided the object represented was as far as possible unmistakable, the lecturer went on to speak of heraldic draughtsmen of the last fifty years who had successfully grasped the problem of sound conventional drawing as applied to heraldry, selecting for mention the names of those deceased—Willem, Pugin (some of whose original drawings for the heraldic glass in the Houses of Parliament were exhibited in the Meeting-room), John Powell, James West, Clement Heaton, and William Burgess, all in their several ways real artists. So far as heraldic art was concerned, Pugin was *facile princeps*. In point of design and arrangement his heraldic glass at Westminster was without equal. The lecturer then dealt with the relations between the helm, the crest, the wreath or torse, and the mantling, describing and explaining the origin and purpose of the various parts, and some methods of treatment.

Touching heraldry abroad, the Germans, he said, had always maintained a love for heraldic device; and the principal front of the new Parliament House in Berlin is ornamented with two fine heraldic panels, in which the shields are combined with sculpture of very high artistic merit. In Spain heraldry was freely used for the decoration of architecture—there were notable examples at Burgos and Toledo. Magnificent cloths of State, embroidered with the arms and badges in gold and colour on silk or velvet grounds, were also in use in Spain. Such decorations, the lecturer considered, might be introduced into municipal and other public ceremonies in our own days. A really fine heraldic cloth would make a much more imposing background to a Royal or municipal group than the extemporaneous and tawdry finery ordinarily the expedient on such occasions, and the cost, in the long run, be less than what is now expended spasmodically on temporary rubbish. As examples of the valuable decorative effect of heraldry in architecture, the lecturer instanced the blazoned shield in the boss at the intersections

of rib-vaulting, or on the hammerbeam of a timber roof, or in some of the high chimney-pieces illustrated in Mr. Gotch's paper. Having summed up the essentials necessary to good heraldic designing, the lecturer, in conclusion, read some notes furnished for the paper by Mr. George W. Eve, author of the recently published work on "Decorative Heraldry." These touched upon the influence of architecture on heraldic designs in book-plates, perceptible from the very earliest examples; the value of the panel as a basis of design, shown in the works of Sebald Behem, Virgil Solis, and others; the extensive use of architectural details in the armorial work of Albert Dürer and his school, and in the elaborate compositions of Jost Amman; and the modifications in treatment the armorials have undergone by the influence of the sculptures and coats-of-arms represented in high relief.

Mr. J. A. Gotch, in proposing a vote of thanks to Mr. Crace, observed that it was a far cry from the Parthenon to the drawings they saw upon the walls—from the mathematical niceties of the Greek building to the infinite variety of line which they saw around them in that room—and yet one of the most suggestive things which might be noticed was the wide interest that attached to all architectural subjects. There had been of late years a considerable spread of the desire for heraldry, and for the use of heraldry. Whether heraldry was native to the nineteenth century, with all our pushing ways and our commercial aspirations, was, to his mind, a question; but, at any rate, there was an increased desire for heraldry, and it was most desirable that architects should be in a position to draw heraldry well. The interest of heraldry, to his mind at any rate did not consist, as it did to some, in the multiplicity of quarterings. That appeared to him to be a vain desire of self-gratification. It consisted in the beautiful rendering of the simplest forms of family arms, so that they did not get a mass of unintelligible decoration such as Mr. Crace mentioned, but that they did get a design which was suitable to the place it occupied, and which was easily read at a distance. Of course they were now, as they always had been, largely in the hands of the officials of this particular form of art, namely, the Heraldic College, and it was with very great satisfaction they saw what greatly improved methods were being followed in that institution. Some ninety years ago the kind of arms which they granted were absolutely impossible of decorative interpretation. When they had an elaborate battle scene, how could they represent that, with its vast amount of detail, decoratively? Or again, if they had the well-known instance of that threepenny piece on which a gentleman had contrived to represent the Lord's Prayer, and which was such a singular event in his life, that when he had a coat of arms granted to him, that formed the principal charge; how could they possibly represent the Lord's Prayer in the size of a threepenny piece, and in a decorative manner? So that they were really very largely in the hands of the Heraldic College in this respect; but he was very glad to know that many officials there had not only a desire for better forms, but the ability to present them, and in the course of time he imagined, when the control of these things evolved and developed in high places—because after all it was those in high places in the institution who actually gave the official design in the matter—they would get even greater improvements than they had at the present time. There was one quality of heraldry which was necessarily inherent in it, and that was vigour, because the whole of heraldic living creatures belonged to the male sex. They never saw a lioness, for instance; they always saw lions. The only female animal—if female animals it could be called—represented in heraldry was a mermaid; and Spenser drew the distinction between things which were mortal, imperfect, feminine, and things which were perfect, immortal, masculine. There was another aspect of heraldry which was also of considerable interest, and that was how to impart interest to commonplace objects. Of course they might say it was comparatively easy to draw an interesting lion or an interesting pig. One of the designs by Pugin, which was illustrated in Mr. Crace's paper, was a pig of most interesting kind. But when one had to draw a porridge-pot, or to draw a wheel even the thing was not quite so easy; and in illustration of the way that difficulty was got over—in one instance at any rate—they had that Spanish cloth before them, and in the lower

artering, on the left-hand side, was the wheel represented in perspective, and represented in a very simple and striking and very graceful manner; and to represent a wheel in perspective would not strike at first sight as being a very easy thing to do in anything but a very commonplace manner. With regard to the mantling, there are several examples on the screen which showed the system of which the old designers ruled themselves. They always recognised that mantling had two sides of different colours, and in the strips into which they divided their white and the other colour balanced each other in a satisfactory manner, and that was an important thing to remember in dealing with mantling in heraldry. Then with regard to book plates, there had been a vast number of designs in recent years, and there had been a very considerable tendency, owing to the facility with which they had found these plates designed, to rather sacrifice the first object of a book plate to the secondary object of making it beautiful. The first object of a book plate was that the name of the owner should be at once intelligible. Now in many of the book plates which he had been really the last thing one was able to ascertain. The man's occupation, his favourite hobbies, have been portrayed in things which, of course, were of interest to him, but not necessarily of interest to the world at large, and his name possibly had been found some obscure corner after a great deal of fumbling. That seemed to the speaker to be an important thing to be preserved in book-plates. With regard to what Mr. Crace had said about the way of treating heraldry, it was useless, or a harmful, whether in ornament or heraldry, to multiply detail where it was itself lost and used the form, and that the best design that which best fulfilled its purpose as a sign—with that he thought they must all sufficiently agree. Throughout his paper it seemed to him that Mr. Crace had struck the right note with regard to heraldic design, and in the present day, if they followed the advice which he gave, they would be able to design heraldry which would be not at all a relic of medieval heraldry, but quite distinct, and very peculiar, as it were, to the nineteenth century, and having as much vigour and as much interest as anything which had gone before it, and that could only be obtained and achieved by doing as Mr. Crace had said, by bringing thoroughly familiar not only with elementary laws of heraldry, but also with anatomical forms of the animals and the objects which had to be portrayed.

Mr. W. H. St. John Hope, in seconding the motion, said he hoped on a future occasion Mr. Crace would embark further upon the question of heraldry, especially that portion of which related to badges and their treatment. There were some very good examples of heraldry placed for their edification upon screens, in English heraldry the artists of old times showed in their treatment of badges. Those who had been fortunate enough, as he had been, to read many old wills, inventories, and documents, considered by some people to be dusty, could not fail to have been struck by the very full way in which badges were used by way of decoration on church vestments, cloths and hangings, and in every possible way in domestic work, from the great hangings of the hall to the pavers of the floor, on the carvings of the wainscoting, in the glass, on the bosses of the roof. Pugin was one of those who in recent years realised that to fill, and some of the panels exhibited, which he supposed formed a portion of a book of Royal Arms and supporters, when he was singly did duty perfectly well for badges, there were other examples of them in cartoons. In other drawings they saw how the shields were used in places to form an important part of the design. Mr. Crace had made very just remarks as to the shocking way in which artists disregarded the proper treatment of crests, helmets, and mantlings, and to what he thought might be added the treatment of coronets. He did not think it was the fact that coronets were restricted to persons of noble rank, because many of the designs on the walls showed that persons who were mere knights used coronets on their shields for the crests to rise out of, and a study of ancient seals would show that even esquires used the same thing. These coronets were, however, treated with an infinite variety which

was utterly foreign to the modern artist, who had no other idea of a coronet than the wretched things which were drawn for him in books of reference, whereas a very slight reference to ancient authorities showed that coronets were treated with the utmost freedom. There was a beautiful seal, for instance, of the Lady Margaret Beaufort, who founded St. John's College, Cambridge, in which her coronet was partly formed of fleurs-de-lys and roses, and even when it came to such simple things as crosses and fleurs-de-lys, the mediaeval artists were able to make beautiful things of them. The other day he was shown a design which emanated from a school of art in the provinces, in which a Royal Crown formed the principal part, but the fleurs-de-lys were as poor as could be seen, and the crosses were perfectly contemptible. Probably it was not his fault. He had not studied old examples, and was not aware that as the old men played all sorts of games with their heraldry, so when it came to such details as coronets they did the same thing. If any one wanted to see a grand specimen let him look at those gorgeous crowns which surmounted the badges in King's College Chapel, Cambridge. Each one of them a masterpiece in its way; no two alike, and yet each one a Royal Crown of England. Particoloured fields played a part in some of the drawings used by Mr. Crace. A reference to old documents brought to one's mind that the hallings, as they were called, that is, the hangings round the hall, were very often built up of a series of striped fabrics powdered all over with badges, and made to look very splendid. He hoped Mr. Crace would give them a further edition of heraldry from that point of view, because he was eminently capable of reproducing on paper the heraldic furniture referred to in old documents, and showing what beautiful things they were, and their entire applicability to modern requirements.

Mr. W. A. Lindsay, the Windsor Herald, said that although by no means an authority upon the question of descriptive heraldry, he could admire what others explained so well. His chief reason for speaking was that he thought the lecturer and Mr. Gotch unwittingly had been rather hard upon the College of Arms, for though in the last century, no doubt, absurd grants of arms had been made, it should be recollected that whatever faults the then members of the College of Arms committed were chiefly due to their assenting too readily to what the public asked for. For instance, a coat-of-arms which he had often contemplated with horror represented that very great and distinguished gentleman, the late Sir James Scarlett, with two supporters, one a black Lifeguardsman's horse, and the other a Lifeguardsman in red. But no herald ever designed that coat of arms and supporters, and it must have been done at the earnest request of Sir James himself. He had himself been asked to propose arms which he considered as objectionable, and had refused; but it was not always possible when dealing with a public body, to altogether refuse to do what the public body asked. When heraldry was used for minor forms of decoration, such as book-plates, he regarded decoration as the principal object instead of being a mere accessory, for he must altogether demur to the observation that the name of the person to whom the book-plate belonged should be made a prominent object in the book-plate.

The Chairman thought that heraldry was one of the most becoming subjects that could be treated of in an institute of architects, for Addison, in his translation of Marshall's advice to a man who was anxious to bring up his son to a lucrative employment, says,

If of dull parts the stripling you suspect,
Make him a herald, or an architect.

Mr. Wm. White said that as he understood it, it was quite a modern invention to introduce the name at all. The names which appear beneath the banners in the "National Record" of the Knights of Windsor did not appear on shield or crest of those who fought in tournament or battle in the days of old. The difficulty which was caused by the ill representation of heraldic forms, heraldic devices, and heraldic principles, had arisen from the absolute neglect of the school of heraldry, as was a little while ago the case with the school of architecture; and the only way to revive a true knowledge of heraldry was by popular lectures and explanations, so that people might understand what heraldry really was.

Mr. Crace, in returning thanks, said that he entirely agreed with Mr. Gotch's view that

vigour was a very essential element in heraldic drawing, and he was very glad that Mr. St. John Hope had called attention to the importance as a distinct subject of that division of heraldry which came under the head of badges—a subject quite deserving of an article by itself. The decorative use of badges was very extensive, and was often perhaps more easily applied than more absolutely heraldic forms. Particoloured backgrounds and striped hangings might also very well occasionally occupy the attention of those who were concerned with internal decoration. In reference to the remarks of the Windsor Herald he would say that in his paper he had endeavoured to avoid any appearance of criticising the Herald's College otherwise than as sharing with the general public that decadence of taste from which not even the Royal Institute of Architects had been wholly free, and he hoped that if the Windsor Herald had the patience to read his paper afterwards he would find that he had specially remarked that the College of Arms only shared that lapse of taste which was somewhat conspicuous during the first half of the present century, and not altogether unknown in the second half. With reference to Mr. White's remark about the use of the name with the shield being a modern invention, he was afraid that view could not be supported, for there were in that room a selection from the Windsor stall plates, and so far from being a modern invention, it would be found that the very oldest of these stall plates had not only the arms of the distinguished persons who were made Knights of the Garter, but their very distinguished names were in a great number of cases, though not in all, under the arms themselves.

The Chairman announced that the next meeting would be held on the 4th prox., when M. G. Harmand, Avocat à la Cour d'Appel, Paris, would read a paper on "Artistic Copy-right."

The meeting then terminated.

THE SURVEYORS' INSTITUTION.

An ordinary general meeting of this Institution was held on Monday in the temporary premises of the Institution, Savoy-street, Victoria Embankment, when Mr. Harvey M. Grellier read a paper on "Tithes Rent-Charge Recovery." The paper does not come within our province to report.

THE CENTRAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

At a meeting of the Council of the Central Association of Master Builders of London, held on the 21st inst., at the offices, 31, Bedford-street, Strand, W.C., Mr. Benjamin J. Greenwood (Messrs. Holliday & Greenwood) was unanimously elected President of the Association in succession to Mr. Wm. Shepherd, whose year of office had expired. Mr. Thomas Gregory and Mr. Charles Wall were re-elected, and elected vice-presidents respectively, and Mr. H. H. Bartlett (Messrs. Perry & Company) was elected treasurer.

A vote of thanks to Mr. William Shepherd for his services during the past year terminated the proceedings.

COMPETITIONS.

ALTRINCHAM (CHESHIRE) PUBLIC OFFICES.—In the competition for this building, to cost 4,000l., twenty-six architects sent in designs. The Council appointed Mr. John Ely, President of the Manchester Society of Architects, as assessor, and his award gave the first place to the design "Vox Populi," by Messrs. Chas. A. Hindle and H. Davenport, of Moncton, near Manchester. The second place was given to "Altrincham," by Mr. J. Macnamara, of Altrincham. Before opening the assessor's award, the Council passed a resolution deciding to adopt the design placed first. This is an excellent procedure, and would give confidence to competitors if more generally adopted. The designs are to be exhibited in public.

PROPOSED CIRCUS, YARMOUTH.—It is stated that the British Circus Syndicate, Limited, having provisionally secured a site in close proximity to the Drive, at Great Yarmouth, will shortly proceed with the erection of a circus building, to seat between 2,000 and 3,000 persons. The architects for the building are Messrs. Bottle & Olley.



Sketches of London Street Architecture.—No. XXIV. The Freemasons' Tavern, Great Queen-street. The late Professor Cockerell, Architect.

SKETCHES OF LONDON STREET ARCHITECTURE.—XXIV.

This is an example from an earlier period of the century than the other modern street buildings of London which we have illustrated, and represents the taste of another generation, but it deserves recognition as the work of an architect of exceptional ability and accomplishment in regard to the modern application of

Classic architecture—the late F. P. Cockerell, and is in itself a very well-proportioned and dignified piece of Academic design.

ENLARGEMENT OF RUGBY CONGREGATIONAL CHAPEL.—Messrs. Linnell & Son have secured the contract for the extensions at the Congregational Chapel at Rugby. Accommodation will be provided for about 160 additional sittings. Mr. J. T. Franklin is the architect.

THE MUNICIPAL CONTROL OF BUILDINGS.

At the Carpenters' Hall, London Wall, on Monday evening, Dr. Longstaff, L. lectured on "The Municipal Control of Buildings." Sir Arthur Blomfield, A. presided.

The lecturer said the difficulties in the way of municipalities attempting to control the

is depended upon a great variety of circumstances. In London and other old cities they rise from the extremely complicated conditions which had been inherited from bygone years. He would undertake to draw up the perfect Building Act that the wit of man could devise for a prairie city. In beginning to build a city to-morrow, as was often done in America, they would be easily able to foresee exigencies that would arise, and to draw up a plan that would meet them. Take the difficulties which beset London. No two streets are laid out on the same principle, nor were they in the same way by the community. One might be devoted to private residences, and other to business purposes, and those business purposes might be varied—warehouses, stores, shops, counting-houses, and offices, having different requirements and being differently circumstanced. Since the larger portion of our population had become dwellers in towns, our responsibility as members of a community had increased. A striking instance which happened when there was no municipal control of buildings occurred in Liverpool, when, for the first time, there was an enormous development in the woollen industry in the West-riding of Yorkshire and in the cotton trade in Lancashire. This led to an immense migration to Liverpool of people from the country districts. The Irish famine followed in 1847, and so great was the influx of immigrants from across St. George's Channel that in Liverpool, as well as Glasgow, there grew up large Irish colonies. These people had been accustomed to live in hovels, by which they suffered but the inconvenience, seeing that they were engaged in such healthy occupations as farming and fishing, which kept them in the open air all day. When these people arrived at Liverpool they were not particular in what sort of dwelling they lived—they went into anything they could find. But the conditions of existence in Liverpool were far different from those in Ireland; hence it became a most unhealthy city. Their rapid influx led to the building of what was curiously called the Scotland ward of Liverpool. The lecturer, by a sketch on the blackboard, illustrated the principles upon which this quarter was originally built. He showed that small back-to-back houses were built round close courts with large privies hidden in the centre, without any regard being given to the necessity for light or air. The buildings, on the whole, formed a shocking example of what builders could do when not controlled by by-laws. Putting aside the year—1849—of the cholera epidemic, when the death rate was over 60 per 1,000 of the population, the lecturer pointed out that for ten years the death rate averaged 36 per 1,000—an enormous mortality. By-and-bye the Liverpool Corporation woke up to the fact that their city was at the top of the list of unhealthy towns, and made superhuman efforts to get rid of the slums which abounded, or rather which comprised the Scotland ward. They spent immense sums, with the result that in forty years they lowered the death-rate from 36 to 16 per 1,000. That meant a saving of something like 4,000 lives yearly in Liverpool.

The lecturer then proceeded to throw upon the screen limelight views to illustrate his arguments. He first gave as a preliminary, some views of the slums of Old Hamburg. Dealing then with the necessity for making statutory provision for the stability of buildings, he threw upon the screen the picture of a building which had fallen during the process of erection. The Dangerous Structure Department of the London County Council dealt annually with several thousand buildings, which, for one reason or another, were not secure. In two instances the buildings collapsed while the department at Spring Gardens was taking steps to get the structure made secure.

Coming to his second point—that of fire-resistance—he remarked that he did not believe absolutely fire-resisting buildings could be built. Winchester House had the reputation of being one such, and he believed though several fires had occurred in it none had spread beyond the room first affected. He himself had, however, come to the conclusion that from the point of view of building construction, the most inflammable materials were iron and stone. In the recent great fire at Cripplegate it would be remembered that the great iron floors fell into shapes suggestive of boiled macaroni. At the same time, brick-work stood fairly well. It seemed to him that a staircase built of solid oak would offer more resistance to fire than stone. On the other

hand, marble was the worst material. His father witnessed the great fire in New York. Although the thermometer stood below zero and the fire-engines were frozen to the ground, the marble columns of the Exchange were calcined to quicklime. As to the question of providing escape from fire in buildings, he ventured to believe that the London County Council had done good work. In fact, so exacting had the Council become in this, that it was very difficult to get a place of amusement put up, except at a heavy cost. Salutary steps had also been taken to insist upon the provision of ample means of escape from factories. This was illustrated by the plan of a factory in which eighty females and six males were employed on an upper floor, the only means of access to which was a wooden step-ladder 2 ft. 1 in. wide. The Council had insisted in this case on two fire-resisting staircases. In the case of the premises of Messrs. Waller & Brown, Hamsel-street, in which the Cripplegate fire broke out, the Council had insisted upon a means of escape from the upper floor to a flat roof. At the fire inquest Mr. Brown stated that he and thirty-eight women in his employ escaped by that means, and but for it there must have been great loss of life.

After touching upon such sanitary requirements as dry walls, and stating that regulations as to drainage should be in general terms, so as not to discourage inventions, Dr. Longstaff proceeded to deal in greater detail with the question of open space about buildings, without which means of ventilation were of little use. Plans were thrown upon the screen to illustrate the growth of slums by the erection of buildings upon back gardens. Others illustrated the overshadowing of one building by another. In the extreme case of some dwellings in Sardinia-street, a number of rooms erected in accordance with the old Building Act had been almost immediately closed as unfit for human habitation under the Housing of the Working Classes Act. The lecturer then exhibited diagrams illustrating the way in which the open space at the rear of buildings is dealt with under (1) the Model By-laws, (2) the Liverpool By-laws, and (3) the London Building Act, 1894. While he gave his preference to the Liverpool method, he stated that London stood alone in having special provisions to regulate the dimensions of internal court-yards and well-holes.

Dealing with the width of streets, the lecturer incidentally expressed his strong disapproval of the removal of such ancient landmarks as St. John's Gate, Clerkenwell, and the Church of St. Mary-le-Strand. There was, on the London County Council, a strong party calling for the demolition of the latter, partly because it was old, and partly because it was a church. Coming to the aesthetic side of the question, he remarked that there were many reasons for affirming that architecture was by far not only the greatest of the arts, but by far the most important, and would be in future by far the most precious. As he showed at the commencement of his lecture, the larger proportion of the population of this country were residents in towns, where the works of nature were destroyed by the hands of man. Was it not, therefore, of transcendent importance that the work of men's hands should be beautiful? It was a valuable education for a toiler to pass through streets of buildings upon which he could bestow his admiration. They owed great debts of gratitude to such organisations as the Kyrle Society, the Commons Preservation Society, and the Society for the Preservation of Ancient Buildings, the National Trust, and, in no less a degree, to the Edinburgh society—the Cockburn. A committee of taste had often been suggested, but appeared to the lecturer to be full of dangers. In his day no doubt the notorious Wyatt would have been a member of such a committee, had there been one. Yet, as was well known, Wyatt did his best to deface two of our greatest and most precious national monuments—the cathedrals of Durham and Salisbury. The lecturer instanced the London, Chatham, and Dover Railway girder bridge at Blackfriars as another instance of how the aesthetic side of London life had been neglected. From the Blackfriars Bridge only the dome of St. Paul's was observable.

The quaint building opposite Chancery-lane, known to have been the palace of Henry VIII. and Cardinal Wolsey, was disfigured by a tradesman's board which could not but give the Cardinal a fit of indigestion were he now alive. As to sky-signs, the lecturer was glad

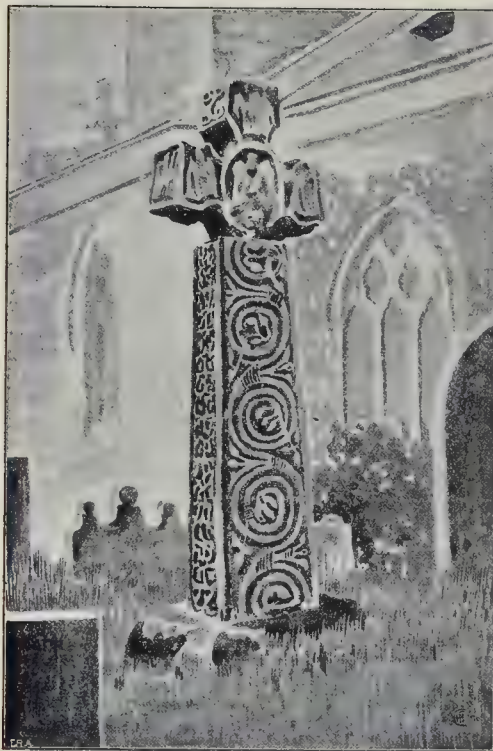
to say that the death-knell of these hideous erections had been sounded by the Sky Signs Act, towards the passing of which he was glad to say he took a humble part. There was yet a phase of this advertising nuisance which was not dealt with by the Act. A notable instance as to how far this abuse could be carried was to be seen on the south-western quarter of Ludgate-circus, where a certain article was advertised in a way quite unjustifiable. He (Dr. Longstaff) was waiting for the citizens of London to tell the County Council that they must get rid of such a hideous defacement. He compared with this distressing picture the view presented by Regent-street, which, thanks mainly to the wise official supervision of Mr. Arthur Cates, representing the Woods and Forests, the ground landlords, was devoid of unsightly advertisements.

The Chairman, in moving a vote of thanks to the lecturer, referred to the Westminster clearance scheme, which, he said, he cordially supported, and held strong hopes that the Bill would pass through Parliament.

The vote was adopted with acclamation, and Dr. Longstaff briefly replied.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The eighth meeting of the session was held at the rooms in Sackville-street, on the 16th inst., Mr. C. H. Compton, Vice-President, in the chair. Mrs. Collier submitted for exhibition an unusually fine example of a coin of Magnentius, found in College Green, Worcester, also coins of Charles III. of Spain and Louis XIV. of France, together with a token of Horne Tooke. The Rev. H. J. D. Astley, Hon. Secretary, exhibited photographs of old engravings of two large family pictures now at Melton Constable, one illustrating the tournament at Paris in 1438, between Sir Jacob Astley and Sir Gerald Massey; the other a combat at Smithfield in 1441 between the former knight and Sir Philip Boyle, in which they are represented fighting on foot. On either side of the two principal pictures are grouped several smaller views, depicting various scenes in the history of the tournament. From the costumes, armour, and accessories, the date of the paintings would appear to be the sixteenth century.—The paper of the evening was by Mr. Allen S. Walker, on "The Screen of All Hallows the Great." The neighbourhood of Thames-street and the river bank is, said Mr. Walker, one of the most interesting spots in London, and may be called the "cradle of the City," as the earliest place of commerce was at Queenhithe. Ever since the time of the Normans, the customs have formed a source of revenue, and here in 1250, Henry III.'s brother—Richard, Earl of Cornwall—had jurisdiction over weights. In the Steelyard, the site of which is now occupied by Cannon-street Station, the Hanseatic merchants were established and had their Guildhall, their charter of Liberty being granted in 1259. They, however, possessed no chapel, but worshipped in the Church of All Hallows the Great. They beautified the church by presenting windows and founding altars, and at length endowed a chapel therein. Edward IV. gave to the Hanseatic League the absolute property of the Steelyard. Here they erected warehouses and other buildings, but, although the League was suppressed in 1560, the Steelyard remained the property of the League until it was purchased for the Cannon-street improvements in 1853. The church was entirely destroyed in the Great Fire in 1666, with the exception of the tower. After the fire the parishes of All Hallows the Great and Less were united, and the church was rebuilt by Sir C. Wren, the cost of the fabric being defrayed out of the coal dues, and amounted to 5,640l. The parishioners, however, raised a rate for the sum of 500l. for the interior fittings. The Master of the Steelyard at that time was Jacob Jacobson, a very rich and benevolent man, who gave 10l. to the poor of the parish and rebuilt the Guildhall; he died in 1680. There is a curious legend to the effect that the famous screen was made in Hamburg and was the gift of the Dutch merchants; but the researches of Mr. Walker into this matter, which have extended over three years, apparently quite dispose of this tradition, for it appears to have been put forward by Malcolm in 1803, 125 years after the rebuilding of the church. It has also been said that Jacob Jacobson gave the screen, but



Eyam.



Bakewell.

Ancient Crosses in Churchyards at Bakewell and Eyam. From Sketches by Mr. F. H. Cheetham.

he died in 1680, and the church was not ready to receive any fittings until 1683. The truth seems to be that the parishioners had always desired to have a screen, but they were in want of money, and could not pay for it. Mr. Theodore Jacobson, who had succeeded his brother as Master of the Steelyard, had given the pulpit to the church, and thereupon came forward and presented the screen. An interesting comparison between the screens of All Hallows and of St. Peter's, on Cornhill, the only other London church with a screen, strongly confirm the belief that both are of English design and workmanship. They only differ in design by some small details, the measurements of both are identical, the cost of each was about the same, and there are other entries in the parish books as to the charges for the screen; and, finally, it is known that the screen of St. Peter's was carved by Englishmen. Some beautiful photographs of both the screens illustrated the paper. The screen is now at St. Margaret's, Lothbury.

CROSSES AT BAKEWELL AND EYAM.

Of the two crosses of which sketches are here given, that at Bakewell stands in the churchyard, close to the east wall of the south transept. It is 7 ft. 10 in. high, the width narrows from 23 in. at the base, to 18 in. towards the top, and it is 14 in. in thickness. The side now facing east, shown in the sketch, has at the top a mutilated figure of a man riding, which is supposed to represent Christ entering Jerusalem. The shaft is sculptured with a scroll springing alternately right and left from a cornucopia. At top of the scroll is a somewhat nondescript animal nibbling at a bunch of fruit, supposed to represent a squirrel, which, the Bishop of Bristol has pointed out, was, according to the Northmen, the messenger between the gods and the earth, its pathway being the sacred tree known as the "world-ash." "I suggest," he says, "that the animal on the Bakewell Cross recalls this early

belief . . . In this case we should have a combination of the Christian and the Teutonic religious beliefs, the Christian tree of life and the pagan messenger of the gods in its topmost branches." The shaft is most likely embedded some distance in its present pedestal-stone, and the figure at the bottom is rather difficult to understand, though generally described as a hand extending a bow, with an arrow pointing upwards. The sides of the shaft are likewise sculptured with a scroll pattern, while the west side, facing the wall of the church, bears a series of sculptures, which, however, are so defaced as to be quite unintelligible. One antiquary tells us that they represent the birth, crucifixion, entombment, resurrection, and ascension of Christ, whilst another assures us that they are intended to represent the twelve apostles! This was, no doubt, originally, the front of the cross, which, when set up in its present position, was placed with its best preserved face to the east. The head of the cross is missing, and the arms are very short, though, I think, complete, as their ends are panelled and covered with scroll work, and the incised moulding of the shaft is carried round them.

The cross at Eyam, which also stands in the churchyard, is in some respects a finer example than that at Bakewell. The east side of the shaft shown in the sketch is ornamented with a scroll like that of Bakewell, and on the head and arms of the cross are figures of four angels. The west face, which is in a far more perfect state than that of Bakewell, is covered, in the lower portion, with knot-work, above which are sculptures representing the Virgin and Child, whilst on the head and arms are again four angels. The sides of the shaft are covered with knot-work. The height of the cross is about 8 ft., but a piece is missing between the stem and the head. For a long time, it is said, these two fragments used to lie among the docks and nettles of the churchyard. They were set up in their present position about sixty years ago.

Dr. Cox has come to the conclusion that these crosses may safely be assigned to the eighth or ninth century. The Bakewell Cross he assigns to the eighth century, and the one at Eyam perhaps a century later. Scroll work is sometimes, though rarely, found in Norman work, but he is satisfied from the style and finish of these two crosses that they are undoubtedly monuments of the Anglo-Saxon period.

F. H. CHEETHAM.

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. T. McKinnon Wood, Chairman, presiding.

The Twenty-mile Radius.—Mr. F. Smith presented a petition from the London Building Trades Council, asking the County Council to return to its original policy of applying the London Trade Union wages and hours of labour to a twenty-mile radius. The petition was referred to the General Purposes Committee.

Labour Bureaux.—Mr. N. Robinson presented a memorial from the St. Pancras Vestry asking the Council to take steps to legalise Labour Bureaux throughout London. The memorial was referred to the General Purposes Committee.

The Building Act Committee.—The Special Committee of Selection appointed last week to arrange the *personnel* of the new Standing and Special Committees presented their report containing the names of the proposed members. The following gentlemen form the Building Act Committee:—Sir Arthur Arnold, E. Bond, W. Davies, G. Dew, Lieut.-Col. C. Ford, R. W. Granville-Smith, Sir John Hutton, C. Jerome, G. B. Longstaff, R. Parker, A. Penfold, G. H. Radford, H. R. Taylor, D. S. Waterlow, and E. White.

Telephones.—An adjourned report of the Highways Committee with reference to the

graph Act, 1892, and the National Telephone Company's underground works was light up. The Committee recommended:

That the Council do approve of the insertion in draft agreement between the Council and the National Telephone Company, prepared in accordance with the resolution of the Council of June 17, of the following clause, and of the schedule therein referred to: The Company shall not during time this agreement shall be in operation, without the previous consent in writing of the Council, charge to subscribers for telephone supply or other any amount larger than the amount of the annual subscription which would be payable by subscribers to the Company within the Metropolitan area of the Company according to the general statement of tariffs contained in Schedule C hereto. Schedule C: General statement of tariffs in the Metropolitan area: On five years' agreement, first section, 12s. per annum; second and additional sections, 10s.; private houses, 8s. On a yearly agreement, first connexion, 12s. per annum; second and additional connexions, 12s. 10s.; private houses, 10s.

N.B.—These tariffs include an area of 600 square miles, which comprises the towns of Dartford, Erith, Redhill, Croydon, Epsom, Richmond, and Sutton on the south side of the Thames, and Epsom, Woodford, Romford, Epping, West Ham, and Ealing on the north side of the Thames.

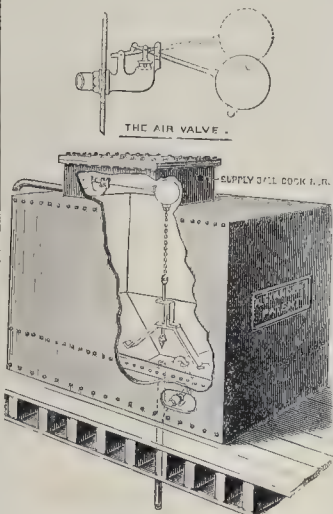
Mr. Benn moved: "That the recommendation be referred back, with an instruction to report to the Council the terms imposed on the National Telephone Company in leading provincial cities for the protection of the streets, for securing reasonable charges to the telephone subscribers." The amendment was seconded by Sir John Hutton, and carried on a division.

The Council, having transacted other business, adjourned at seven o'clock.

ALEXANDER'S PATENT CISTERN AND AIR VALVE.

THIS is one of the most useful improvements in water cisterns which we have seen for a long time. Its chief object is to exclude dust and dirt from the water, so that the latter shall be delivered to the consumer in the same state as it is received in the cistern from the water supply. It is quite impossible for mice to enter this cistern, for the top is firmly closed down and the only access to the water is by means of an air valve, although, of course, part of the top screws off to permit inspection in case of necessity. Another improvement is a device for warning the householder when the water is cut off from the main. The whole may be described as follows:—The cistern is constructed so that the bottom has rising sides; the top is furnished by an air-chamber which rises above the general level; this chamber may be opened from above for inspection purposes. Inside is an ordinary ball-cock so adjusted as to admit of an air-space in the upper part of the air-chamber. Apart from this is an air-valve, actuated automatically (according to the height of the water in the cistern) by an ordinary ball-float. On some water being drawn from the cistern, this float sinks with the water level, and this movement is communicated to the valve, which is thus caused to rise, and air, corresponding in bulk to the quantity of water drawn off, is admitted. When water is on at the main the depression of water level in the cistern also affects the ball-cock in the usual way, and water is admitted. As this rises it carries the ball-float with it, and the air-valve is closed at the same time as the water ceases to run in from the main. In the event of the ball-cock getting out of order, and the water rising beyond the normal top level in the cistern, the float of the air-valve rises with it, and, by a reversing motion, the valve is opened, permitting the water run through it, thus converting itself into a waste-pipe. Another part of the invention consists in giving warning when the water is cut off at the main. On the sloping sides of the floor of the cistern a metal framework is fixed in such a manner that two holes, one directly above the other, but a few inches apart, are directly in vertical alignment with a hook affixed to the under side of the ball-float of the air-valve. To this hook a chain is fixed, which in turn is joined to a vertical rod working in the two holes mentioned, and which actuates the valve. To the lower end of this rod a handle valve is fixed, which fits into the aperture of the outflow pipe beneath. This apparatus works as follows: As the water is drawn off, and the float of the air-valve

descends, the vertical rod descends also, until when the water reaches a certain level the spindle valve alluded to fixes in the aperture of the outflow pipe, and thus prevents any more water from running out of the cistern. This can only take place when the water is cut off from the main, as otherwise the inflowing water preserves the water level in the cistern in such a manner as that it is impossible for it to be low enough for the spindle valve to act. People below finding no water running know that there is yet a good supply left in the cistern.



Alexander's Patent Cistern and Air-valve.

and in order to get it, one must go up to the cistern and open a by-pass. By this warning, the remaining water (say three-quarters the capacity of the cistern) may be used as economically as possible.

As we said at the commencement, this invention is a very useful one, and we shall be greatly surprised if it is not very rapidly recognised. Already the East London Water Company has approved the use of the cistern and appliances in their district. We have seen the inventions at work, and can testify to their effectiveness.

THE NORTHAMPTON INSTITUTE, CLERKENWELL.

THE Northampton Institute, or City Polytechnic, was opened on the 18th inst. by the Lord Mayor and the Lady Mayoress. The land upon which the Institute stands is roughly one and a quarter acre in extent, and is triangular in shape, the apex of the triangle resting upon Northampton-square and the base upon St. John-street-road. The block of buildings in St. John-street-road contains the main entrance in the centre, with the large hall on the north, and on the south a four-story building, chiefly, but not entirely, consisting of rooms devoted to the social and recreative work of the Institute. The northern side of the triangle, extending from St. John-street-road to Northampton-square, along Lower Charles-street, consists of the buildings which contain the bath and the gymnasium, each of which is 120 ft. long. The former has dressing-rooms beneath, and the latter has over one end of it a three-story building devoted to educational work. These buildings enclose an internal triangle or courtyard, from which the inner rooms and corridors derive their light. On two of the floors the corridors run completely round the building, the other floors having corresponding corridors as far as the limits to which they extend. The various floors are reached by three staircases placed at the angles of the triangle formed by the courtyard. Over the main entrance there is a tower supporting a bracket clock, and containing in the belfry a peal of bells intended to act as the chiming and hour bell of the clock.

Broadly speaking, the new institute in Clerkenwell is to provide the recreative and technical side of a complete polytechnic. Attention has been paid to the immediate requirements of Clerkenwell, and the educational work of the Institute has been divided into the following departments:—(1) Mechanical Engineering and Metal Trades, (2) Artistic Crafts, (3) Applied Physics and Electrical Engineering, (4) Horology, (5) Electro-Chemistry, (6) Domestic Economy and Women's Trades. For the present

the non-metal sections of the building and furniture trades are grouped with the mechanical engineering and metal trades.

In this department the engineering workshop is at the north end of the basement corridor in the front, or St. John-street-road, building. The workshop is equipped on the two long sides with hand-benches fitted with various kinds of vices. Down the centre of the room there are the machine tools. Across the other end of the shop are the grinders. The whole of the power for the machine tools is derived from three different electric motors, so that only the small amount of shafting connected with the tool in use need be run at any one time. On different nights of the week classes are held in this shop for fitters and machinists, cycle makers, tool makers, die sinkers, and press tool makers. The next room is the smithy, and on the opposite side of the corridor will be found rooms devoted to carpentry and wood work generally. Other rooms in this department are a boiler house, power room, electrical engineering laboratory, plumbers' shop, metal plate workers, mechanical and building trades laboratory, plastering and brick-cutting room, instrument workshop, and drawing offices. The drawing offices are on the first floor, at the east end of the building in rooms Nos. 76 and 77. The rooms have been fitted with specially designed tables and conveniences for workshop drawing. A special feature of the rooms is the system of lighting, which is that of inverted electric arcs. The Applied Physics and Electrical Engineering Department will comprise (on the first floor) an electrotyping room, a laboratory for metallurgical chemistry, and (on the second floor) an optical laboratory, near the south-west staircase; junior physical laboratory (also used for physical work in connexion with the engineering and building trades sections); senior physical laboratory; heavy electrical engineering laboratory (in the basement), and, on the second floor, the electro-chemistry laboratory.

Lecture and class rooms are provided on the first floor, but, as the bulk of the instruction is given in laboratories, workshops, drawing offices, &c., the provision of this kind of accommodation is not so extensive as might, perhaps, be expected in so large an educational building. There are two large lecture-rooms, one at each end of the corridor.

The horological department consists of the watch-makers' room and the clockmakers' room.

The work taken up in the artistic crafts department differs from the ordinary art work pursued in similar institutions, in that it is wholly aimed at reaching the artistic industries of the Metropolis. The department is accommodated with two large studios, embracing the greater part of the top floor of the educational side of the building, and has in addition other rooms devoted to special crafts. Design and Modelling are taken in the large studios, the design classes which involve working on paper being taken in room No. 122, and those which involve working in plastic material being taken in room No. 121. Accommodation is provided for silversmiths' work, chasing and enamelling, wood carvers, goldsmiths, engravers, and painters and decorators.

The domestic economy and women's trades department is situated at the east end of the top or third floor on the educational side of the building. The domestic economy school consists of three rooms, viz. the kitchen, the dressing-room, and the laundry. In the women's trades room classes are held in which attempts are being made to bring technical instruction, as distinct from domestic economy, within the reach of women engaged in various trades.

The provision for the work in the social and recreative section includes (1) a large hall for entertainments, (2) a gymnasium, (3) a swimming bath, (4) social and club rooms for men and women, with refreshment rooms attached, (5) library and reading rooms, (6) rooms underneath the hall suitable for music classes. The large hall is capable of seating 1,400 people. The body of the hall is 100 ft. long by 67 ft. wide. The platform extends about another 24 ft. backwards, and upon a low gallery over the back of the platform is an organ. There are four direct exits from the hall into the street from the ground floor and three from the gallery level. Cloak rooms are provided at the north end upon both floors. The gymnasium is 120 ft. long by 50 ft. wide, with a gallery for spectators running round three sides of it. Underneath one end are dressing rooms, baths, and lavatories for the accommodation of the male members, and at the same end on the ground floor there is similar accommodation for the women members. The swimming bath is also 120 ft. long and 50 ft. wide. The pond is 100 ft. long by 35 ft. wide, and lined with white marble. It is surrounded on three sides by the dressing boxes, seventy in number, and to a less extent by a gallery for spectators.

The social and club rooms comprise a women's social room, room for the lady superintendent, and the suite of refreshment rooms consisting of one for the men, and the other for women, with a servent between them. At the far end of the men's refreshment room is a room which has recently been furnished as an extension of the social room accommodation for men.

The library and reading rooms are on the second floor on the front side of the building. The library

is a room about 52 ft. long by 22 ft. wide. Rooms for music classes are underneath the large hall.

For illustrations of the building and for further particulars, see the *Builder* for April 15, 1893; June 30, 1894; and June 8, 1895. The builder was Mr. Walter Wallis, and, as most of our readers know, the architect was Mr. E. W. Mountford.

DRAWINGS FOR THE ROYAL ACADEMY.

As usual, we shall be glad to receive and deliver at the Royal Academy all drawings intended for the Architectural Room which are sent to us in time to be photographed for publication before sending in.

The last day for receiving drawings at the Academy is Monday, March 28, and we can receive none at this office later than 12 noon on Saturday, March 26.

Every drawing must have two labels giving the title of the work and the name and address of the author, one affixed to the back of the drawing, and the other attached by a string so as to hang over in front of the drawing, and must be accompanied by a letter to the Secretary of the Royal Academy, giving also the title of the work and the name and address of the author. If more works than one are sent they must be numbered, and referred to by the corresponding numbers in the letter to the Secretary.

Gilt frames only are admissible at the Royal Academy.

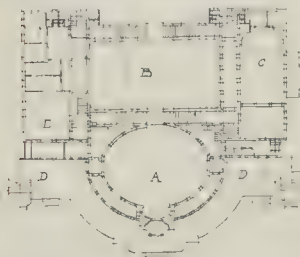
We cannot provide labels for drawings which are sent without them.

Illustrations.

THE PEOPLE'S PALACE AT ZURICH.

THE new People's Palace (or "Tonhalle") at Zurich, fulfils the modern requirements of a Continental town in combining different classes of concert halls, assembly rooms, &c., with a restaurant, some club rooms, &c., as well as a large garden for use in summer. The accommodation necessary at Zurich is extensive, on account of the large number of tourists who constantly pass through the town. Its position, overlooking the lake, and backed by the mountains, was primarily selected to meet the wishes of the sightseer; the facilities for approach are very convenient for him, as the frontage of the garden is towards the main embankment of the Zurich Lake, and near the principal hotels and the theatre.

The architects of the building are Messrs. Fellner & Helmer, of Vienna, whose commission was the outcome of a competition which at the time caused much bad feeling. As a matter of fact, there were three competitions, and two of the assessors in the second competition actually competed for the com-



The People's Palace, Zurich. Plan.

A.—Pavilion. B.—Grand Concert Hall. C.—Small Concert Hall. D.—Terrace. E.—Restaurant.

mission, in the third, utilising the ideas of the unsuccessful candidates.

The requirements comprised the provision of a principal concert hall, with seating capacity for 1,500, an orchestra of eighty, and a chorus of 350; a large assembly room to accommodate 1,000 visitors; and a small concert room suitable for the presentation of stage-plays for an audience of 500. The necessary restaurant, club rooms, and offices had to be provided for on a large scale, whilst particular stress was also laid on the facilities of cloak-room accommodation, the cloak-rooms, as a matter of fact,

taking up the whole of the space on the ground floor, which is directly below the two concert rooms.

As regards the general arrangement of the building, the large assembly room takes the principal position with a view on to the lake, and there are terraces in front of this part of the building, with flights of steps down to the garden. The large concert room is at the back, and the smaller concert room at the side, but they have been so placed that they can be easily used together for public functions, and also, if necessary, used in combination with the assembly room and the terraces, which are all on one level.

The treatment of the building, though not of any considerable architectural merit, is happy in the expression of the plan, for all the principal halls are clearly indicated on the elevation according to their importance. There are two towers at either side of the large assembly room, so arranged as to give an excellent view of the scenery, and at the same time to form important features in the grouping of the block.

The work was carried out in a comparatively short time, though considerable difficulties had to be contended with in the foundations.

THE PORTAL ST. SAUVEUR, DINAN.

DINAN disputes with Morlaix the distinction of being the most interesting town in Brittany to the architect. To say nothing of its quaint, overhanging houses, the Church of St. Sauveur is very impressive, both inside and out. The west doorway, here sketched, is an excellent example of Romanesque; and the east end, which is much later in date, is a lesson in the art of buttressing and weathering, outside and inside it is apsidally vaulted very beautifully.

C. A. NICHOLSON.

CHURCHYARD GATEWAY, ST. JEAN DU DOIGT.

ST. JEAN DU DOIGT is a secluded little village reached by diligence from Morlaix, lying in a wooded valley running down to the sea. Its church, which is supposed to contain the finger of St. John, from which flows a miraculous stream, is quite one of the most picturesque collections of buildings in Brittany. The churchyard is entered by the gateway here sketched, and contains a magnificent fountain, the lower part of which is stone, the upper of elaborately modelled lead, representing the baptism of Christ. The churchyard also contains an open chapel of Renaissance character, with a carved wood roof.

C. A. NICHOLSON.

DESIGN FOR A SMALL COUNTRY CHURCH.

AN attempt was made in making this design to get away from the hackneyed type of country church, and also to keep well within the limitations of the material to which it was restricted by the conditions of the Grissell Medal Competition, for which it was prepared.

A certain air of quaintness combined with simplicity has been aimed at, and the author is inclined to believe, from the charming results in some of the quaint church towers of Surrey and Kent, attained by a similar treatment, that the design would not be unpleasing in execution.

H. MACINTOSH.

MEMORIAL TO THE LATE COUNTESS OF DUCIE.

THE monument illustrated is to the memory of the late Countess of Ducie, and stands in the beautiful churchyard of Tortworth, Gloucestershire. The sculpture was by Mr. F. W. Pomeroy of Chelsea, the builder's work being carried out by Messrs. Cornish & Gaymer, of North Walsham.

The complete memorial to the late Countess consisted not only of this monument but of the removal of the organ to a more fitting place in the church, two very fine Elizabethan tombs, which it formerly completely obscured, having been thus brought into view. It has been set in a teak case, with a memorial inscription in repoussé copper, and two stops have been added to the pedal organ. The tone of the instrument, formerly too powerful and oppressive for the church, has been greatly improved by the new conditions. The work was executed in 1895.

W. D. CAROE.

"BRIARCOURT," HUDDERSFIELD.

THIS house is built of local stone, the quarry being chosen because it yielded stone having variety of colour, as opposed to the usual ideal of each stone being exactly the same tint. The mason joints are also broad. The roof is of stone slates. The interior woodwork was yellow pine, three of the rooms being panelled. The total cost, including 130l. for balustrades, was 3,500l.

EDGAR WOOD.

Correspondence.

To the Editor of THE BUILDER.

TYPHOID AT MAIDSTONE.

SIR,—My attention has been drawn to criticisms in your issue of March 19 relating to my report on the Maidstone water supply and the typhoid epidemic, published in the *Public Health Engineer* on March 5.

You accuse me of suppressing evidence, and, apparently, ground that accusation on my manner of dealing with Dr. Washbourn's contributions to the Local Government Board Inquiry. The cardinal fact in the Maidstone epidemic is that, although a bacteriologist was fetched to Maidstone very early in the day, and although the Water Company afforded every facility for investigation, and although many examinations were actually made, there was total and absolute failure to discover the presence of the typhoid bacillus in any part of the water supply.

The Tutsham in Field spring, which is supposed to have been the worst source of the disease, was, indeed, subjected to bacteriological examination on September 21, October 19, November 5, December 11 in the year 1897, and on each of these occasions manifested its entire freedom from the typhoid bacillus.

Now the most natural explanation of this cardinal fact is that, throughout the epidemic, the Maidstone water has been devoid of typhoid bacilli; and I believe that is the true reading to be adopted.

Dr. Washbourn's assertion, which you quote—"that no importance can be attached to this failure to detect the bacillus"—I did not consider worthy of notice. It is a curious eccentricity, the counter-part of which has often been heard when my scientific brethren have met with results which do not square with preconceived notions.

I pay more attention to the actions of Dr. Washbourn than to his words; and, inasmuch as he too, the trouble to seek the typhoid bacillus, I am inclined to believe that he did attach importance to the result of that search.

If Dr. Washbourn did really believe that the typhoid bacillus was incapable of being found in the drinking water—as he appeared to hint when he gave evidence before the Local Government Commission—why did he not decline to make that search which he knew was foredoomed to failure? You seem to accuse me of another suppression, because I paid no attention to that passage in Dr. Washbourn's report, which runs as follows:—

"The Tutsham in Field spring was undoubtedly contaminated with animal excreta on both occasions on which it was examined."

To that I reply that, inasmuch as that assertion of Dr. Washbourn's was based on his finding no typhoid bacilli, rather more coldly than he thinks ought to be present in water, I attach very little importance to it. And my favourable opinion of the quality of the spring is confirmed by Dr. Sims Woodhead, who failed to find coli bacilli at all in that water. And, finally, the early chemical analysis of Mr. Gregor and Dr. Adams are quite conclusive. The remarkable absence of free ammonia in this spring, demonstration of the absence of that sewage contamination upon which the serious charge against the Water Company has been made to rest.

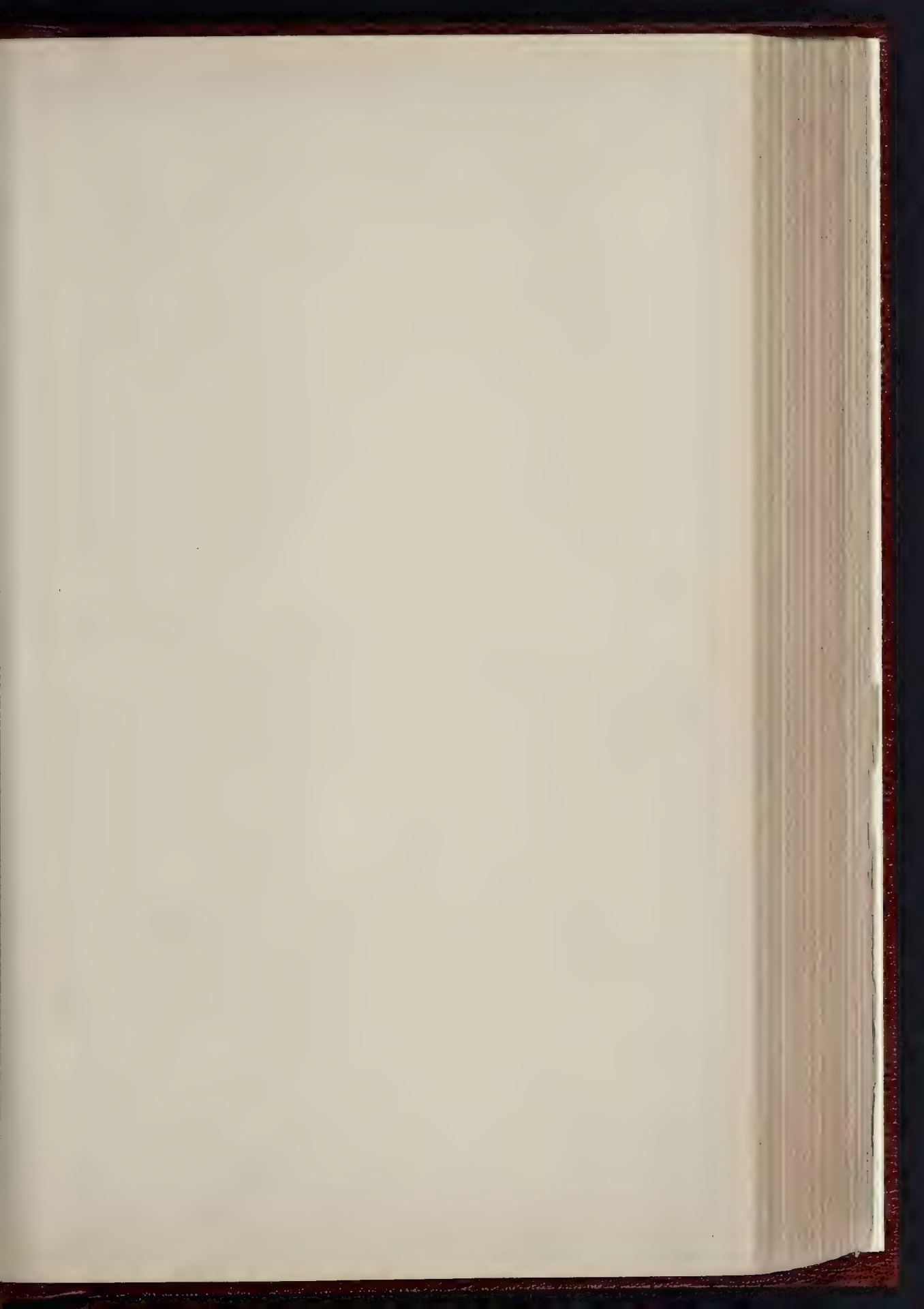
J. ALFRED WANKLYN.

* * Unless Professor Wanklyn means to impugn either the veracity or the ability of Dr. Washbourn—and we find no trace of this in the foregoing letter—the latter's evidence as to the contamination of some portion of the water must be taken into consideration by all impartial inquirers, and we can only repeat that its suppression by Professor Wanklyn in his article on the subject was "unscientific." Perhaps it may be pertinent to ask if the typhoid bacillus has been discovered? Professor Wanklyn in progress from the cesspool on which he evidently lays the blame, to any of the infected houses.—ED.

THE ACCIDENT AT MESSRS. CRACK & SONS.

SIR,—I had a similar accident some years since, and found the way the gas and air mixed in certain relative proportions automatically, very interesting. An ordinary three-light hydraulic pendant had been pulled down sufficiently to unseat the dip-pipe and the burners were left alight and the room vacant for three hours.

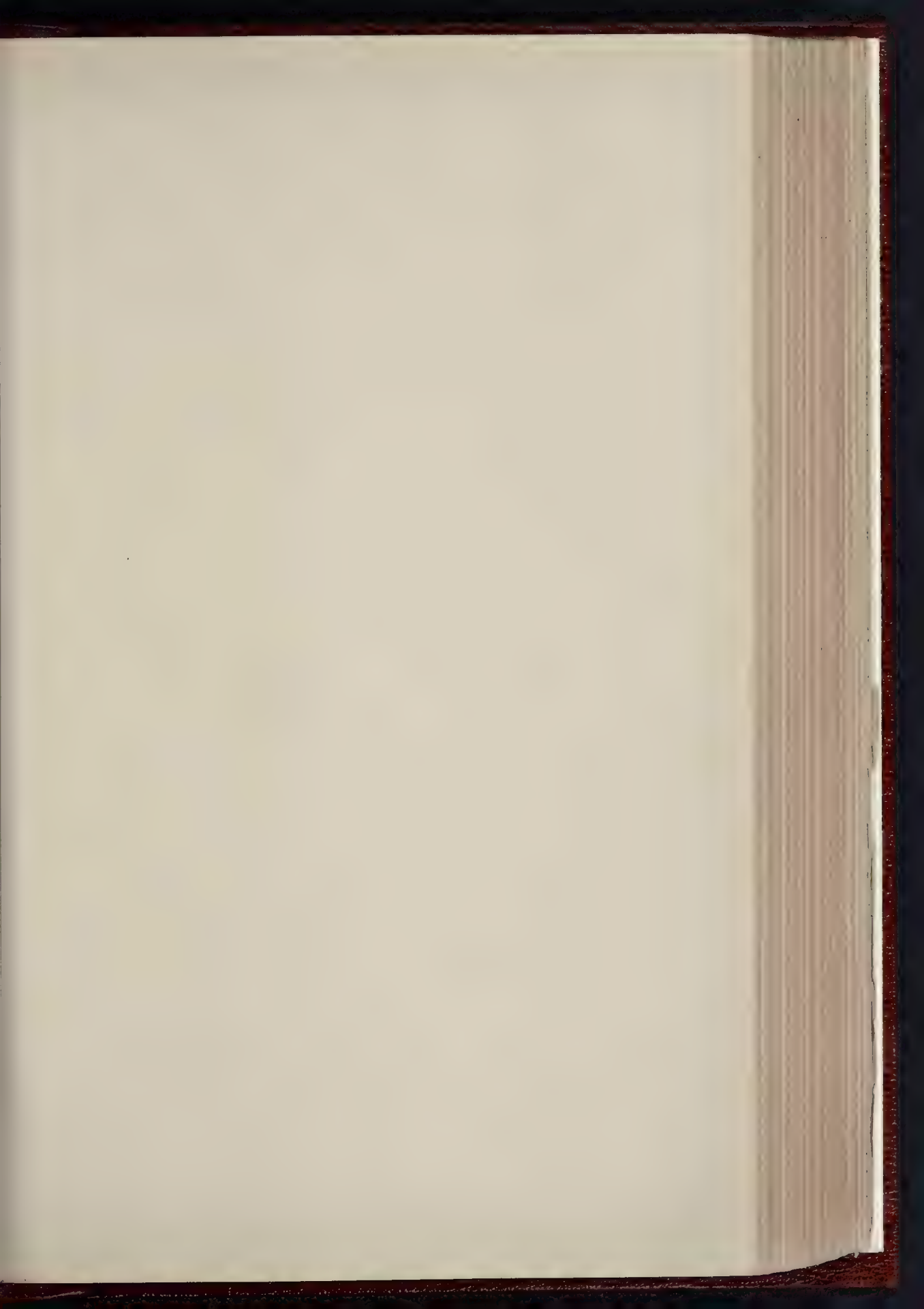
An explosive mixture of gas and air had formed against the ceiling, and was descending (as





PEOPLE'S PALACE, ZURICH.—



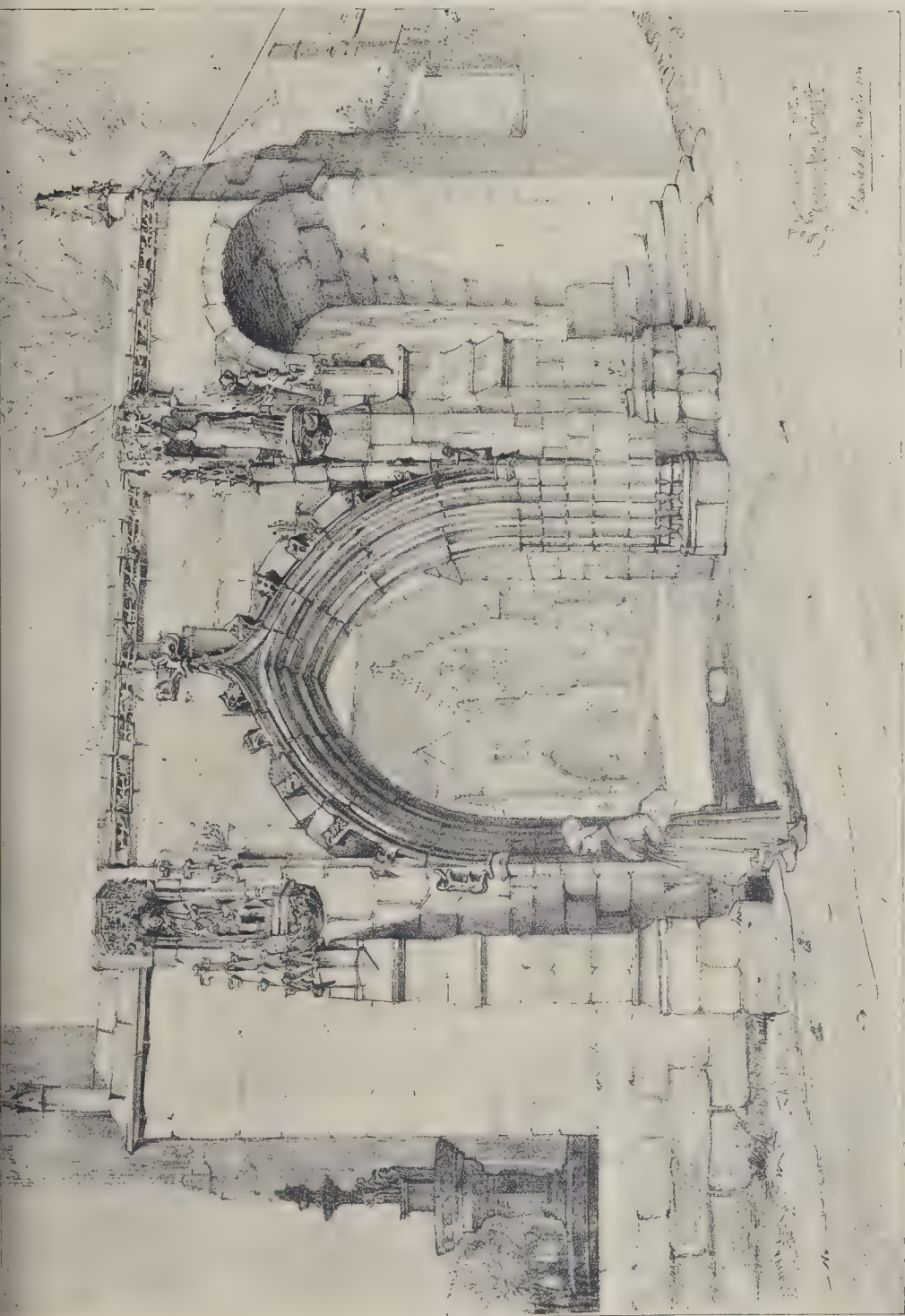


THE BUILDER. MARCH 26, 1918

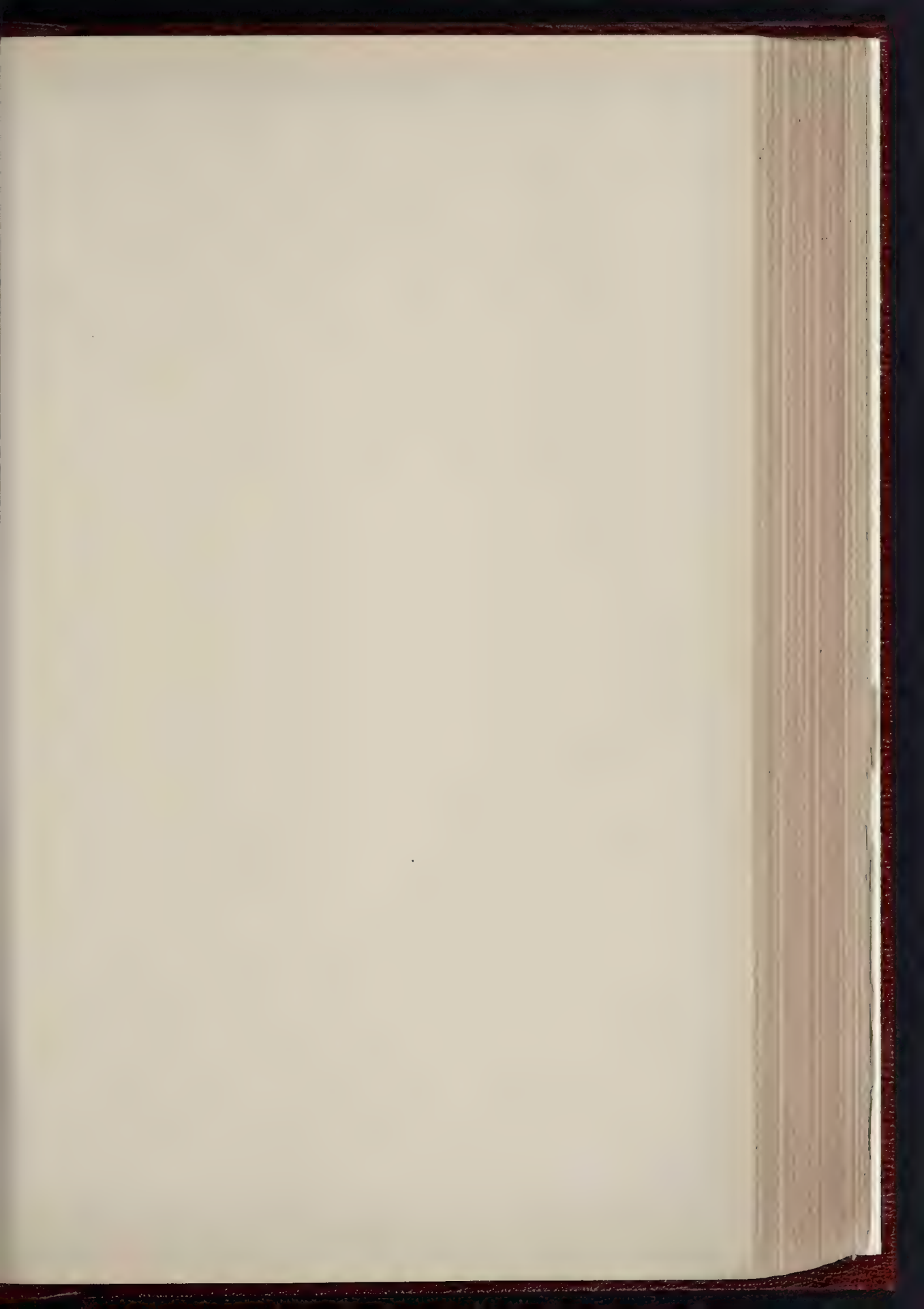


PLATE 10
THE BUILDER
MARCH 26, 1918

PLATE 10
THE BUILDER
MARCH 26, 1918



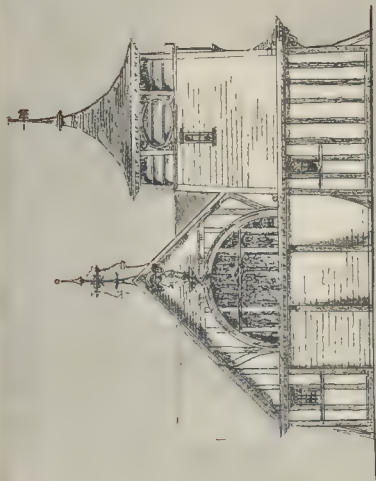
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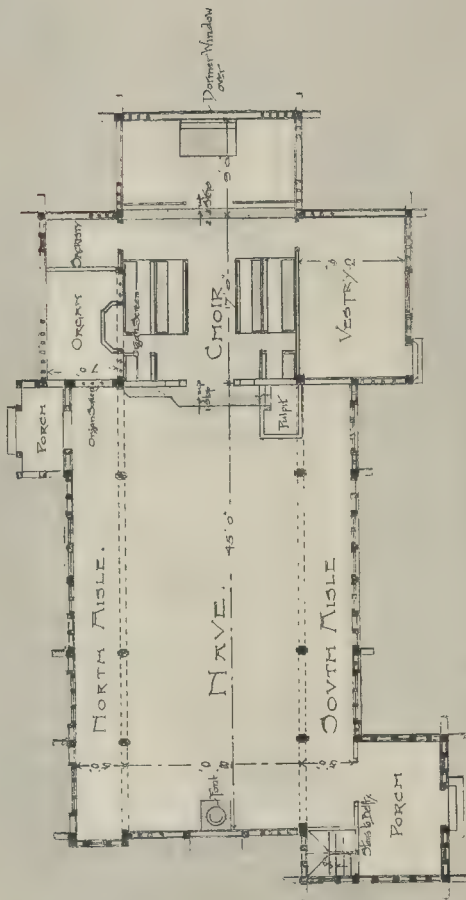
THE BUILDER, MARCH 26, 1898.



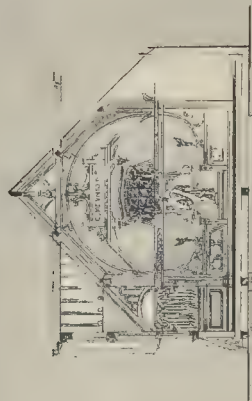
SOUTH ELEVATION.



WEST END ELEVATION.

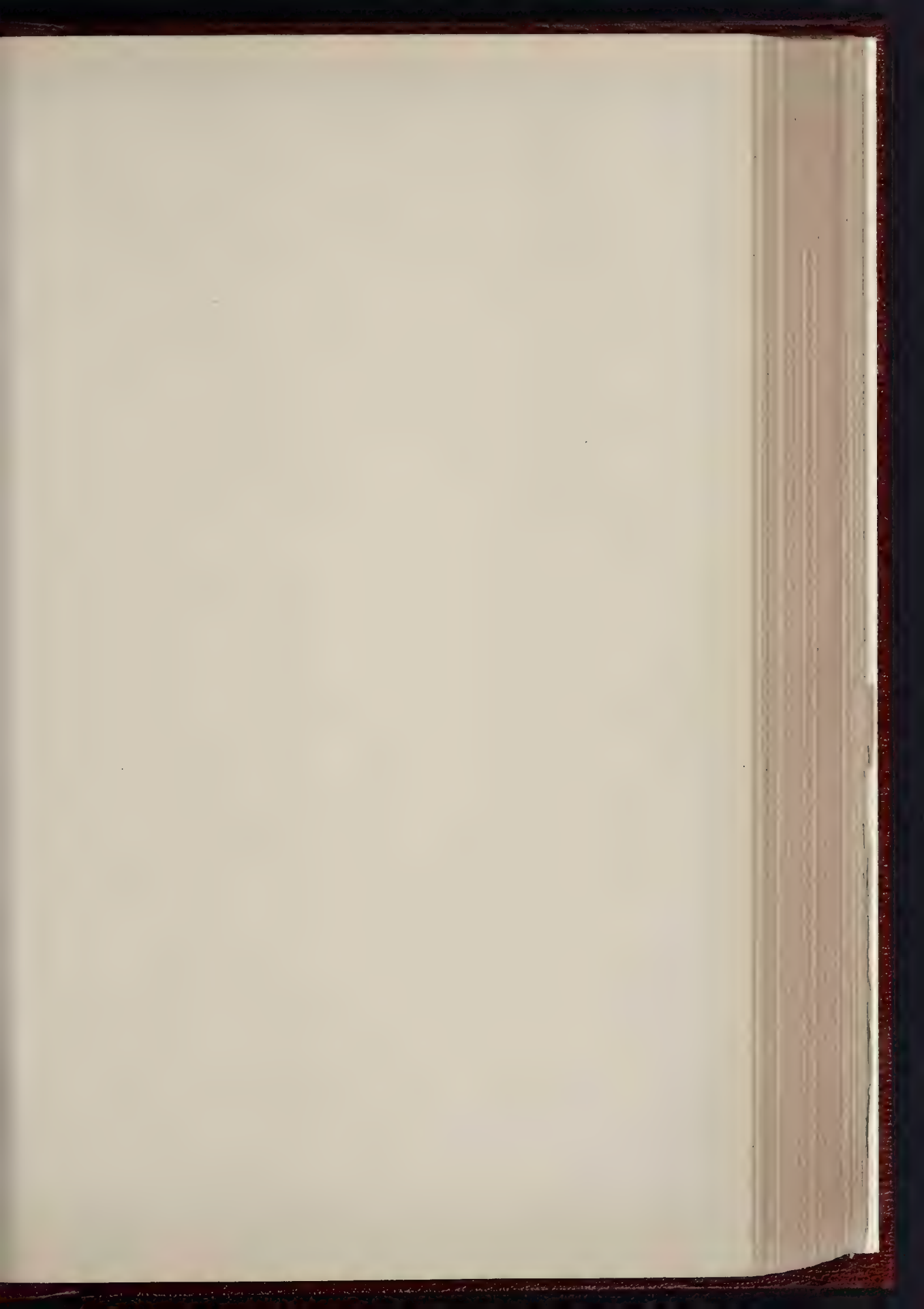


FLOOR PLAN.

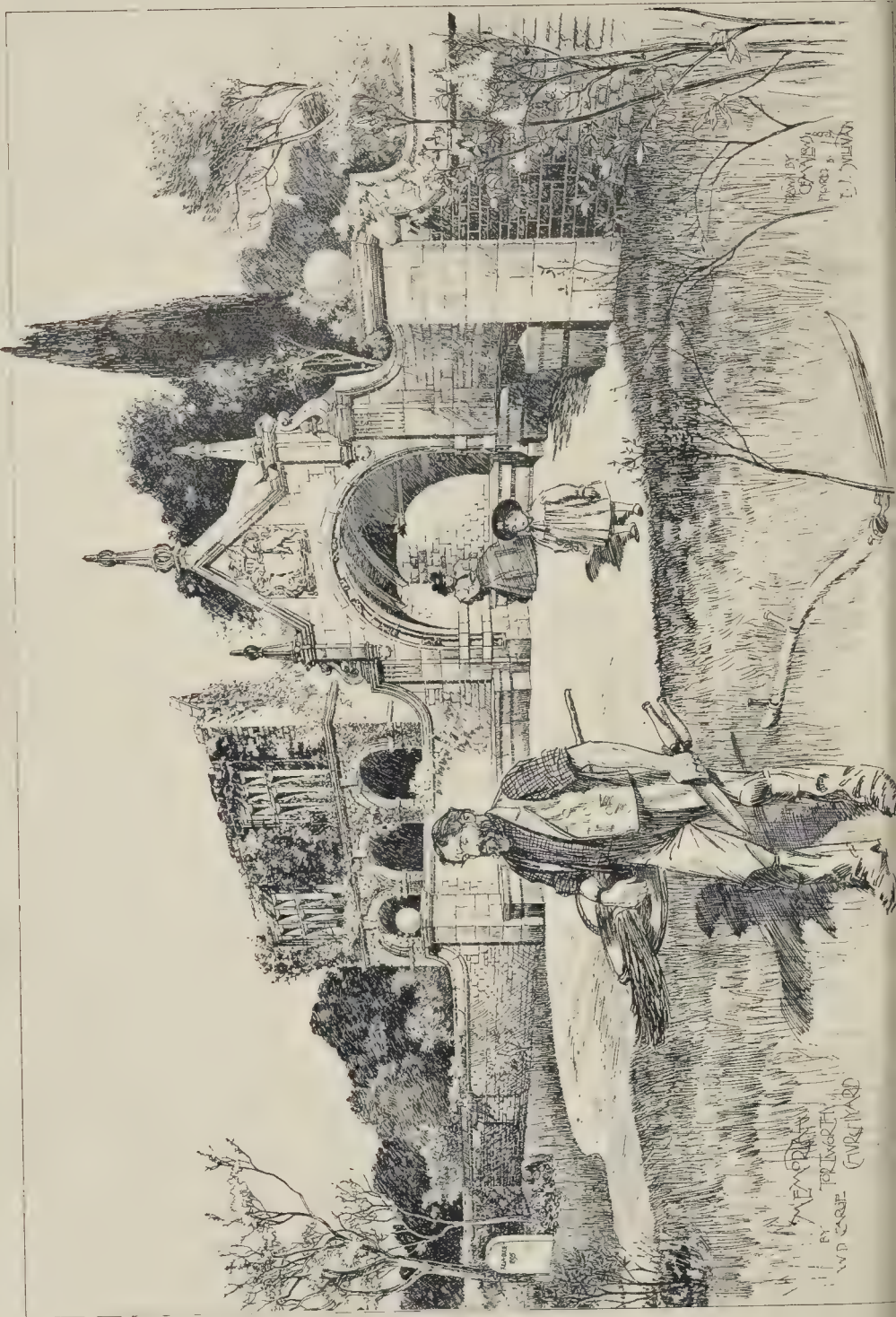


SECTION.

T.M. 101



THE BUILDER. MARCH 26, 1898



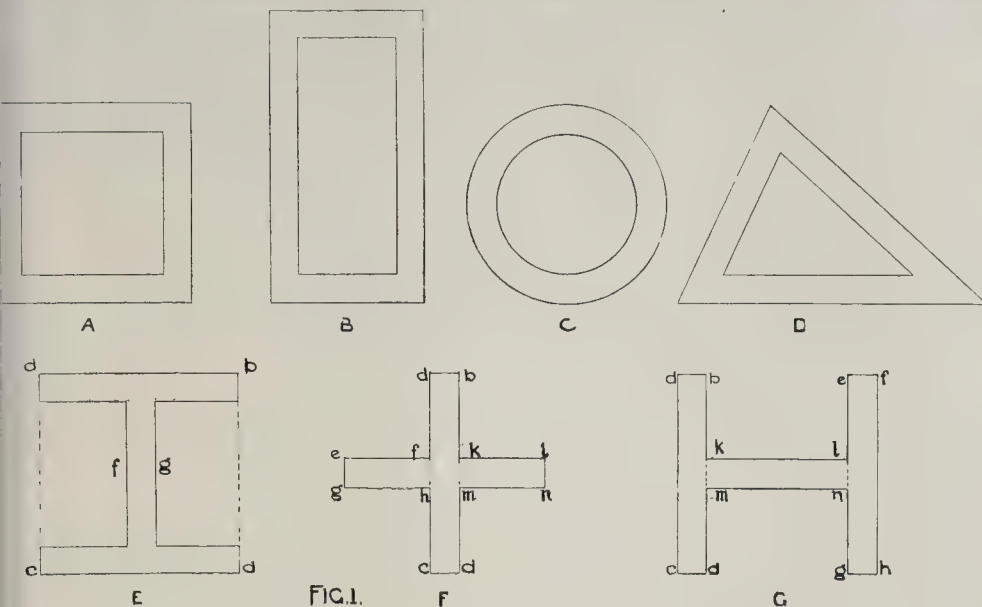


FIG. 1.

ned) towards the floor; in this case it had shed about 4 ft. downwards from the ceiling. A person entered the room, pushed the pendant wards, and as soon as the lights reached the loose mixture, there was an explosion—a bay down blown into the street, and the room rocked.

The remedy is simple and inexpensive. If a ventrator is inserted in the chimney breast discharging to the flue, the explosive mixture will not reach the flame but escape into the flue.

ROBERT PHILLIPS
(County Surveyor, Gloucester).

THE ANCIENT PRIORY, BANGOR.

SIR,—In a short paragraph in the *Builder* of day, describing the recent discoveries at Bangor, it is given to me, together with Mr. Gregory and Professor White, of considering "the so-called stone pavement" to be "the pavement of one of the walls of an ancient building."

I should be much obliged if you would give me the opportunity of stating that "the so-called stone pavement" I always considered to be part of a bible wall. It was constructed with massive sea boulders.

In forming the new roads the ancient foundations have been cut through at a few points only. They are sufficient, however, to give us an idea of the site of the Priory, with the positions of the Church and conventual buildings.

Of the sepulchral slabs discovered, one is of the most perfect design of any in this neighbourhood. The heraldic device on a second renders it of especial interest.

The roads are being laid out from the plans of Mr. Shearson Gregory, of Bangor, who has kindly given me every facility to examine and take notes of his discoveries.

A full report will probably be published by Mr. Gregory and myself in "Archæologia Cambrensis."

HAROLD HUGHES, R.C.A.

Bangor, March 19, 1898.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XIII.

FROM the consideration of beams built up of plates and angle irons rivetted together, with which we dealt in the last chapter, we may now go on to those in which the web is represented by an iron framework or trussing. As in the case of rivetted beams, the flanges may be considered as resisting the whole of the longitudinal compressive or tensile stresses; and, as before, the strength of the flanges to resist the tensile or compressive stress must be examined in the same way as in the case of rivetted beams.

The bending moment or moment of rupture in the case of beams of this character is, of

course, exactly the same as for any other beam loaded in a similar way, inasmuch as it depends upon the load and its position with respect to the points of support, and is in no way influenced by the character of the beam; but the resisting moment of the beam does depend upon the form of the beam and the arrangement of the material of which it is composed.

With such beams as we are now considering, the moment of resistance of the beam is clearly made up of the longitudinal resistances of the flanges measured by their moment about the neutral axis. It therefore equals the longitudinal compressive resistance of the upper flange multiplied by its leverage about the neutral axis, plus the longitudinal tensile resistance of the lower flange multiplied by its leverage about the neutral axis. This equals the sum of the longitudinal resistances of the two flanges multiplied by half the depth of the beam. Or if we assume that the longitudinal resistances of the flanges are, as they must be, equal, then we may see that the moment of the resistance of the beam is equal to the longitudinal resistance of one of the flanges multiplied by the whole depth of the beam.

We said that the longitudinal resistance of the two flanges must be equal, and this is true as long as the beam is safely sustaining its load. But it does not necessarily follow that the longitudinal strength of each of the flanges is equal, although, if the beam is well and scientifically designed, both the ultimate strengths and the resistances of the flanges will be equal. And since, as the proverb has it, "the strength of a chain is that of its weakest link," so in a beam, if one flange be weaker than the other, the beam will fail when the strength of that flange is too small to resist the portion of the whole stress which comes upon it. And, inasmuch as we have seen that the moment of resistance of the beam is the longitudinal resistance of either flange multiplied by the whole depth, it follows that the flange will fail when its resistance is less than the bending moment divided by the depth of the beam.

The web of a rivetted girder, and, indeed, of all iron girders, is far more likely to fail by buckling than by shearing, and their ability to resist this is calculated in a similar way to that of a column or strut, for they may be regarded as flat columns or struts, the thickness being the least diameter; and the following formula may be used for estimating the buckling load:—

$$BL = \frac{14}{d^2} \cdot I + \frac{1000}{1000} b^2$$

where BL is the buckling load in tons per

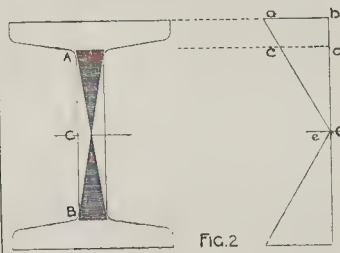


FIG. 2.

square inch of vertical cross-section of web, b is the thickness of the web, and d is the depth of the girder.

The safe load will be the proportion of the buckling load that the factor of safety dictates.

In rolled iron or rolled steel girders the web is, for practical reasons of manufacture, considerably thicker in proportion to the flanges than in the case of rivetted or lattice girders. It is, therefore, hardly fair, although it is well within the limits of safety, to regard the flanges only as resisting the compressive and tensile strains. In the diagram fig. 2, ACB is a rolled iron joist, showing, in the hatched portion of the web, the relative resistance actually afforded to compression and tension by the part of the web. Assuming that the upper flange is resisting a compressive stress of 5 tons per square inch by drawing AB, as in the diagram, to represent 5 tons to scale, and drawing AE to the neutral axis, we should have at C D the amount of compressive stress resisted by the top fibres of the web, and the triangle C D E would therefore give us the amount of stress resisted by the upper half of the web, and a similar triangle that resisted by the lower half of the web. In assuming the moment of resistance of rolled iron joists, we should therefore take the moments of these triangles, acting at their centre of gravity, about the neutral axis, in the method which we have already explained in dealing with the general principle of moments of resistance.

For rough calculations, although not exactly accurate, the strength of beams not of a precisely square and solid form may be approximately calculated as follows:—

With hollow beams of the forms A, B, C, D, in the diagram, fig. 1, the thickness of the beam being taken as equal throughout, a tolerably close approximation to the real strength may be obtained by finding the strength as a solid

beam, and then that of a beam of the size of the organ, and deducting this from the former. With beams of the forms shown at E, F, G, the approximate strength will be for E (its top and bottom being of equal size) the strength of a rectangular beam $a b c d$, less that of two beams corresponding to the hollows deducted at f and g .

In the figures F and G we should find the strengths of three separate beams $a b c d$, $e f g h$, and $i k l m n$, and add them together to obtain the approximate strength of the form shown.

Triangular beams vary in their relative and actual strength according to the results of various experimenters, this variation being probably due to the difference in various materials, and even in the same material between the tensile and compressive strength. Thus, according to Barlow's experiments with fir, triangular beams with the base up will carry one-sixth greater loads than with the base down. Tredgold, on the other hand, came to the conclusion that the position of the beam makes no difference to the strength, and that the strength of the triangular beam is one-third that of a rectangular beam of the same base and perpendicular height. A triangular beam is therefore not an economical one, as with half the material of a rectangular beam, it has only one-third the strength. Hodgkinson, experimenting with cast-iron beams with the base up, found that the strength was one-third that of a rectangular beam of the same base and height. Rennie, on the other hand, found that with the base uppermost his results agreed with those of Hodgkinson, but with the base down he made the strength about $\frac{1}{6}$ of a rectangular beam of the same base and height.

The truth seems to be that within the limit of elasticity of the material it does not matter whether the base or apex of a triangular beam is uppermost; but when the elastic limit is exceeded, then the difference between the tensile and compressive strength of the material affects the result.

The calculation for the strength of stone beams may be made in a similar way to those for timber beams, using the formula

$$W = \frac{C B D^3}{L}$$

and assuming the constant for the breaking load of good granite to be 1 cwt.; for good slate on bed, 3 cwt.; for good sandstone, $\frac{1}{2}$ cwt.; for marble, 1 cwt.; for limestone of the nature of Portland, $\frac{1}{4}$ cwt.; of the nature of Bath stone, $\frac{1}{4}$ cwt. The safe loads for stone beams should not exceed one-tenth of the breaking load, by reason of the very great variation in different specimens, and the liability to want of uniformity in their structure and composition.

BOOKS RECEIVED.

NORTON-SUB-HAMDON, in the County of Somerset, By Charles Trask. (Taunton: Barnicott & Pearce.)
ARCHITECTURAL PHOTOGRAPHY. By G. A. T. Middleton. (Hazzell, Watson, & Viney.)

GENERAL BUILDING NEWS.

NEW CHURCH, ABERDEEN.—Separate tenders are to be procured for the proposed new Established Church (800 sitters) at Mid Stockert-road, Aberdeen, and for the chancel and vestry. It is not intended meantime to expend much above 4,500l., but when the funds permit, a hall, &c., will be added. Mr. W. Kelly, Aberdeen, is architect.

RESTORATION OF FALMOUTH PARISH CHURCH.—Some works of restoration at this building have just been carried out by Messrs. Rickard, of Plymouth, under the supervision of the architect, Mr. Edmund Sedding, also of Plymouth. The total cost of the alterations and additions has been about 3,000l.

WESLEYAN CHAPEL, HALIFAX.—A new Wesleyan Chapel is to be erected at the top of Pellon-lane, opposite the end of Queen's-road. This will consist of a chapel at first, to be followed by a schoolroom, for which land is reserved. The architects are Messrs. Uley, Hebblethwaite, & Co., and the cost of the edifice, exclusive of site, will be over 3,000l.

WESLEYAN CHAPEL, PRESTON, HULL.—On the 17th inst. the foundation stones of the new Wesleyan chapel at Preston were laid. The chapel is being built on the Hedon-road, at the entrance to Preston village. Mr. Leonard Sharp is the architect.

BAPTIST CHAPEL, OADBY, LEICESTERSHIRE.—A new Baptist chapel is being erected at Oadbey. The building is in the Gothic style, and when completed will accommodate about 400 worshippers. Below the chapel is a school-room for Sunday-school purposes. At the west end of the chapel there is a

recess, where it is hoped to shortly place a new organ, and at either side of this are the vestries. There is a gallery in course of erection at the east end of the building. The total cost will be over 2,000l. The architect is Mr. G. Brown.

CONGREGATIONAL CHURCH, PANTEG, MONMOUTHSHIRE.—The memorial stones of the new Congregational Church now in course of erection at Panteg, Ystalyfera, were laid recently. The church is being built of native stone. It will accommodate 1,000 sittings, and the cost is estimated at 3,000l. The architect is Mr. W. Williams, Swansea, and the contractor, Mr. J. R. Williams, Ystalyfera.

SCHOOL, CADOXTON-BARRY.—The sanction of the Education Department has just been obtained by the Barry School Board to the erection of a school on a site in Barry-road, Cadoxton. The new school will cost about 4,000l., and the architect is Mr. H. Budgen, Barry and Cardiff.

SCHOOL, YOKER, NEAR GLASGOW.—The new school which has been erected in Elgin-street, Yoker, by Old Kilpatrick School Board, was opened on the 17th inst. by Lord Overton. The new school is three stories in height, the ground floor being all school, the upper two for department and Standard I, the other standards being arranged on the first and second floors. The head master and mistress have their private rooms on the ground floor in close proximity to the respective boys' and girls' entrances. There are also rooms provided for male and female teachers on each floor. On the upper floor a portion is to be utilised for a cookery-room, cloak-rooms and lavatories are provided on each floor. There are separate entrances for the boys and girls, as also playgrounds and latrines, which are detached and placed at some distance from the school. There will be provided a detached house for the janitor and caretaker. The contract for the school completed is estimated at about 13,000l., and the building will give accommodation for about 1,250 scholars. The contractor was Mr. Mason, Mr. David Winton, Dalnair; Wright, Mr. Alexander Ferguson, Glasgow; plasterers, Messrs. H. & J. Williamson, Clydebank; plumbers, Messrs. Speirs & Sons, Glasgow; slater, Mr. John Anderson, Glasgow; painter, Mr. Alexander Anderson, Glasgow; heating appliances, Messrs. Reans & Wardrop, Glasgow; master of works, Mr. John Moffie. The architect was Mr. Henry Higgins, Glasgow.

INTERMEDIATE SCHOOL, LLANERNIS.—Plans for this school are being prepared by Mr. Rowland Lloyd Jones, architect, Carnarvon.

PROPOSED NEW THEATRE, BIRMINGHAM.—It is proposed to erect a new theatre for Birmingham on the site now occupied by the circus in Corporation-street. The Corporation-street frontage will be devoted to eight shops, with either residential chambers or offices above. The property on the Dalton-street side will be utilised as warehouses and business premises. The stage, at the James Watt-street end of the site, will be 70 ft. wide by 45 ft. deep, with the necessary dressing-rooms, scene-dock, dynamo-room, &c. The pit, which will be on the floor level, will provide accommodation for 800 persons, with 150 stalls in front, the incline of the house, together with the sweep of the circles and gallery, being so arranged as to command an uninterrupted view of the stage from all parts. The pit entrance will be in Ryder-street, a covered recess being provided. The dress-circle will be reached by a vestibule and staircase in marble and mosaic, opening out at the corner of Corporation-street and Ryder-street. The private boxes will be placed at the extreme back of the circle. The dress-circle will seat 275 persons. The scheme of decoration will be Moorish throughout. Mr. Francis Maicham is the architect.

THEATRE, DUDLEY.—The contract for "Dudley Opera House," the new theatre to be erected in Birmingham-road, Dudley, by Mr. J. Clement, has been secured by Messrs. J. H. Whittaker & Co., of Dudley. Mr. Abraham Ramsell, of Dudley, is architect, and Mr. Bray, Smethwick, clerk of the works.

THEATRE, BODESLEY, BIRMINGHAM.—Plans have been prepared by Messrs. Owen & Ward, of Birmingham, for a theatre to be built at the corner of Clyde-street, Bodesley. The building will have a frontage to High-street, Bodesley, of 100 ft. The stage will be 70 ft. by 45 ft., and the auditorium, 70 ft. by 65 ft., will accommodate 2,700 persons. Above the pit there will be two tiers—dress circle and gallery—and these are to be erected on the cantilever principle.

PROPOSED PRINCE'S THEATRE, NORWICH.—Plans of the proposed Prince's Theatre, Norwich, have been prepared by Mr. Sidney Stott, of Oldham. The main entrance to the proposed building will be in Prince of Wales-road. The theatre will contain from 2,000 to 3,000 seats—pit, dress circle, and gallery. A covered corridor will run from Prince of Wales-road right through into Greysfriars-lane.

BANK, KINGSWOOD, NEAR BRISTOL.—Bank premises are being erected at Kingswood, on a site close to the entrance to Kingswood Moravian Church in Regent-street. Plans were prepared by Messrs. Henry Crisp and Co., of Oldham, and the construction of the new building was placed in the hands of Messrs. W. Cowlin & Sons. The room on the ground floor, to be used for general banking purposes, is 24 ft. by 23 ft. in extent. To the left of it is the manager's office, adjoining which is a fire-proof strong room. A book-room and other premises

for the bank's business are provided, and there is residential accommodation for the manager.

HOTEL, OLDHAM.—At a recent meeting of the Oldham Licensing Justices, a plan for the alteration and extension of the "Duke of Edinburgh" King-street, was submitted by Messrs. Wild, Collins, & Wild, architects, and approved by the justices.

CHURCH OF ST. PATRICK, GALWAY.—The Church of St. Patrick, Galway, has just been rebuilt. The architect was Mr. William Hague, Dublin, and the contractor, Mr. Lydon, Galway. The church, which has been built in the Gothic style, is divided into nave and chancel, with side porches, sacristy, and an organ loft at the end of the chancel. Immediately behind the altar the church is lighted by a large tracery window of cathedral glass variously tinted.

POST OFFICE SAVINGS BANK.—The House of Commons have agreed to a vote of 45,000l. for the purchase of a site near Olympia, West Kensington, for the erection thereon of a new Western Savings Bank. The proposed buildings will cost, it is estimated, 180,000l., and will serve in lieu of the once-contemplated further extension of the buildings in Queen Victoria and Knightrider streets, which, it is expected, are eventually to be devoted to postal purposes.

BUSINESS PREMISES, BRADFORD.—With the erection of the block of new buildings by Mr. George Newby, the improvement of Union-street, Bradford, is now practically completed. The block is 207 ft. in length, 73 ft. from front to back, and 67 ft. high, and its erection has been accompanied by a widening of the street from 12 to 14 ft. to a uniform width of 18 yards. The new building is five floors in height, divided into five warehouse blocks, for each of which will be provided a crane worked by electricity, and the premises will be lighted with the electric light. The structure is of stone, with brick lining, and the roofs are of slate and iron. The architects have been Messrs. James Young & Co., of Bradford. Messrs. A. Braithwaite & Co., of Leeds, have been the contractors for all the work except the carpentry and joinery, which has been carried out by Mr. W. G. Bogg, of Bradford.

PROPOSED ADDITIONS TO LOWESTOFT SANATORIUM.—The Corporation of Lowestoft having applied for leave to borrow 1,400l. for the erection of an additional pavilion to the Infectious Diseases Hospital, Dr. Mivart, one of the Local Government Board inspectors, held the usual inquiry recently at the Town Hall. The plans were explained by the Borough Surveyor (Mr. G. Hamby).

TECHNICAL SCHOOLS AND FREE LIBRARY, MIDDLEWICH.—On the 17th inst., the foundation stone was laid of the custodian's cottage in connexion with the new technical schools and free library which are being erected at Middlewich. Mr. Worth is the architect, and Messrs. Clarke & Son are the builders.

COTTAGE HOMES, STYAL, CHESHIRE.—The cottages and houses of which the new housing operation of the Board of Guardians is erecting in the neighbourhood of the village of Styal are approaching completion. The architect is Mr. J. B. Broadbent. Altogether the Guardians have expended about 50,000l. upon their scheme, apart from the cost of the land.

HOTEL WELLINGTON, TUNBRIDGE WELLS.—This building has been altered and enlarged under the superintendence of the joint architects, Colonel Edis, F.S.A., of London, and Mr. W. Barnsley Hughes, of Tunbridge Wells, Mr. W. H. Cauty acting as clerk of the works, whilst Mr. John Jarvis was the contractor. A lift has been erected by Messrs. Waygood & Co., London.

THE HORNUM MUSEUM, DULWICH.—A few weeks hence work will be begun upon the Hornum Free Museum, which its founder, Mr. Frederick J. Hornum, M.P., intends to present to the inhabitants of Dulwich. The new building will consist of two galleries, each upwards of 100 ft. long, lighted from the top. In addition, there will be a lecture hall, having a seating capacity for 300 persons. Altogether the museum, including the administrative block, will be some 300 ft. in length, its front being constructed of stone, with a clock tower over 100 ft. in height. The galleries will be divided into various courts. The architect of the new museum is Mr. C. Harrison Townsend.

HOTEL ADDITION, DEESIDE, ABERDEENSHIRE.—A large extension is to be made at the "Lerney Arms" Hotel, Torphins. The architects are Messrs. Jenkins & Marr, Aberdeen, and the contractors are: Mason, J. Burgess & Son, Aboyne; carpenter, W. Duguid & Son, Ballater; slater, Andrew Davidson, Banchory; plasterer, Geo. Merson, Banchory; plumber, A. E. Robertson, Aberdeen.

CHURCH OF ST. ANDREW, BURSELEM.—A new block of buildings, including both schools and chapel, has been erected in Hall-street, Burslem. The schools occupy the lower story and comprise a mixed school with places for 224 children, with separate entrances and cloak-rooms for both sexes; an infants' school with places for 130 children, with cloak-rooms, &c. The church is on the upper floor, and provides accommodation for about 380 persons, and has a gallery for choir at one end, and a sanctuary, with priest and choir sacristies, and two staircases. This church is only temporary in its use, as when the permanent church is built on the site adjoining, the upper floor will be used to

side additional school accommodation, for which use it has been planned. The builder is Mr. Ian Cooke, of Burslem, Messrs. Barlow & Son doing the gasfitting and painting under him. Heating is by the high-pressure small-bore system, executed by Messrs. John King & Co., of Liverpool. Messrs. R. Scrivener & Co. are the architects.

OTELS, DUBLIN.—Members of the Architectural Institute of Ireland visited recently two buildings under erection and renovation for the Central Hotel Company, Limited, Dublin. The members called at Eschequer-street at 2.30, and were invited and conducted over the building there by clerk of works, Mr. F. Hayes. The work is being done by the contractors, Messrs. M. Meade & Co.

The exterior is faced with red Portlannock stone, having Portland stone cornice and dressings. The party next proceeded to D'Olier-street, where they looked over the Central Restaurant. The constructional work has been carried out by Mr. Egan, and the decorations by Messrs. Gibson & Co. Both these buildings have been designed by Hotel Company's architect, Mr. William M. Hell, R.H.A.

ELIC HALL, PITSEA.—A public hall to seat 450 is now in course of erection at Pitsea, Essex. Work is being carried out by Mr. Joseph Bayliss, of Crest Gate, E., from designs by Mr. Arthur T. Power, of London.

PROPOSED PUBLIC HALL, BRIGHOUSE.—It is proposed to erect a new public hall, to be known as "Victoria Hall," in Huddersfield-road, Brighouse. The structure will be composed mainly of stone, but a stone front facing Huddersfield-road is intended.

The centre of the lower story of the building is divided into two parts. The pit, or stage, is below the level of the road, and is approached by a special entrance on the north side of Huddersfield-road. The dimensions of the space are about 57 ft. square, and seating accommodation will be found for about 900 persons. A dress circle, on the second floor, is reached by a staircase at the south corner of the building. Behind the dress circle, and on separate sides, are located the ladies' and gentlemen's lavatories and cloak-rooms, and between, and over the three previously-mentioned shops, a sloping gallery is placed, with a promenade in front. It is calculated that 700 persons can find sitting room here. The stage is 48 ft. wide by 25 ft. deep, with a proscenium of 28 ft. Dressing-rooms for lady and gentlemen artists are also connected with the stage. The building has been prepared by Messrs. Sharp & Waller, architects, Brighouse.

VITARY AND ENGINEERING NEWS.

SEWERAGE SCHEME, SWANAGE.—A Local Government Board inquiry was held at Swanage on the 19th inst. by Mr. H. H. Law, one of the Board's officers, concerning the application of the Urban Sanitary District Council to borrow a sum of £8,500 for sewerage purposes. Mr. Francis Newman, the engineer, laid the plans before the Inspector and explained their details.

BRIDGE WELLS WATER SUPPLY.—The High Surveyor (Mr. E. Mellor) has just submitted to the Waterworks Committee of the Town Council a scheme for new filtration works at Wapping, where the reservoirs are situated. The estimated cost of the scheme will be about 20,000l., before the next meeting of the Council Mr. Mellor, engineer, is to be consulted.

BOARD'S NEW WORKS, LIVERPOOL.—In accordance with the requirements of Parliament, the House of Commons, through the Secretary of the House, has sanctioned the expenditure which will have to be incurred by the Mersey Docks and Harbour Board in the event of the present session. The total cost of the new works is put down at 3,051,204l., and is divided into the following:—Enlargement of Wapping Dock, 148,380l.; two branch docks on the site of King's Dock and the warehouses adjoining, 451,017l.; a new and enlarged passage between Wapping Dock and Queen's Dock, 82,236l.; widening and deepening of Queen's Dock, 112,217l.; new graving dock and wharf, 159,133l.; widening of the dock on the sites of the northern portions of Queen's Graving Docks, the south quay of the Half-tide Dock, and the shipbuilding yards on the graving dock and the river Mersey, 441,000l.; a second branch dock on portions of the Trafalgar Dock and Eagle Basin and the shipbuilding yards mentioned, 285,067l.; a new enlarged cut from Queen's Dock to Coburg Dock, with swing bridge, 83,244l.; deepening of Coburg Dock, 5,678l.; alteration of Coburg Dock, 142,125l.; widening of Union Dock, together with enlarged passage between it and Brunswick Dock, with swing bridge, 158,310l.; new graving dock on the site of the Western Brunswick Dock, 155,403l.; new entrance from the Mersey into Brunswick Dock, with locks,

396,190l.; a river wall from the Eagle Basin to the North Pierhead, including the raising of the existing wall in front of the shipbuilding yards between Queen's Graving Docks and the River Mersey, 49,192l. In addition to these works, known as "the Southern Works," the estimates include the following proposed "Northern Works":—Widening of Huddersfield Dock and the construction of a branch dock therefrom, 482,783l.; widening of the Half-tide Dock and the construction of a graving dock therefrom, 202,813l.; a branch dock on the site of the southern portion of the Sandon Dock, 199,738l.—*Liverpool Courier.*

WATER SUPPLY, DOUGLAS.—The Water Committee of the Douglas Town Council have under private consideration the report of Mr. George H. Hill, water engineer, just received, on a scheme of increased water supply for the town of Douglas. Kerrowdhoo, the last reservoir of the company, with a storage capacity for about 25,000,000 gallons, was completed about five years ago. Mr. Daniel Cregeen, the Manx engineer, at that time advised a large scheme of engineering. Mr. Hill's report, now under private consideration, is for a new reservoir in West Baldwin at a point lower on the river than Ingebreck, having an area of about twenty-five acres, and to contain 300,000,000 gallons. The reservoir must be this size if compensation water is to be provided for mill works in Douglas river, and the cost will be 50,000l. but if compensation is given in money instead of water, a reservoir with a capacity for 180,000,000 gallons will be sufficient, and will cost about 8,000l. less. The supply from the larger reservoir, after allowing ample for water compensation, will be 1,500,000 gallons per day, which, added to the present gravitation supply, will give a total supply of 2,500,000 gallons per day. If a compulsory Act for the carrying out of the work is obtained for promulgation in July, the reservoir may be ready for use for the fourth season from now. The scheme will shortly come before the Council in public discussion.

PROPOSED NEW BRIDGE, HADDINGTON.—It is proposed to erect a new bridge over the Tyne at Haddington, the construction of which Messrs. Beilfrage & Carr, C.E., who have been consulted on the subject by the Town Council, have recommended.

NEW DOCK, LLANELLY.—The first sod of a new dock for Llanelly, to be constructed by the local authorities, has just been cut. For the last dozen years the Harbour Commissioners have been engaged in the work of improving the seaway channels. This work has been carried on at the cost of over 20,000l., and it is still proceeding under the direction of Sir Alexander Rendel, as consulting engineer. The new dock is on property belonging to the Commissioners. It is skirted by the G.W.R. trunk line, and the wharves will be in communication with a number of local railways. The dock contract has been entrusted to Mr. Nott, his portion being estimated to cost about 60,000l. The area of the dock will be 9 acres; length, 1,000 ft.; breadth, 400 ft.; quayside, 1,200 ft.; depth on sill, 27 ft.; width of entrance, 50 ft. The work will be conducted under the supervision of Sir Alexander Rendel and Mr. Colin P. Fowler, resident engineer.

DRAINAGE SCHEME, KINGSWOOD, NEAR BRISTOL.—On the 17th inst. a meeting of Kingswood Urban Council was held with a view to receive reports from Mr. Lomax (engineer) and Major Tullock respecting the district drainage scheme. The Chairman explained that they not only wanted to borrow sufficient money to carry out the sewerage scheme, but also to borrow some 6,000l. or 7,000l. for their electric lighting. Mr. Lomax (the appointed engineer for the scheme) said he had been through the whole of the sewers with Major Tullock with the object of putting on one side for ten or fifteen years that portion of the scheme which was not absolutely necessary for the present time. Their object in preparing a large scheme was so as to arrive at an idea of what would ultimately be carried out—one in fact that they might work up to. The Council, after going over the ground, had decided that there were certain of the sewers which might be left out for a time. That reduced the estimate from 60,000l. to about 51,000l. He suggested, after consulting with Major Tullock, submitting the whole scheme, and only to ask sanction for that portion of the work which might be immediately necessary. Mr. Lomax then went on to detail certain other alterations which would reduce the cost for the time being to 38,150l. Various questions were then put to, and answered by Major Tullock and Mr. Lomax.

SHERBORNE SEWERAGE SCHEME.—On the 15th inst. Mr. Walter A. Ducat, Local Government Board Inspector, held an inquiry into the application by the Sherborne Urban District Council for sanction to borrow 8,000l. for works of sewerage and sewage disposal. Mr. Thomas Farrall, the Council's Engineer, gave evidence as to the new outfall and other sewers to be constructed. The sewage on leaving the 2 ft. outfall sewer passes into screening and detritus chambers, then to mixing chambers, and thence into two Candy circular precipitation tanks, 23 ft. in diameter by 1 ft. deep, fitted with automatic sludge-removal apparatus, and finally on to the oxidising and aerating polarite filter-beds. The two precipitation tanks have a capacity of 40,000

gallons each, and are capable of efficiently treating upwards of 400,000 gallons per day, and the four polarite filters, each of 135 square yards, will effectually purify 500,000 gallons per day. The Engineer stated that on account of the small tank and filter-bed area required for the "International" process, the system was the most economical, it being much cheaper than those methods which involved the use of very large areas of tanks and filters.

MANCHESTER SEWAGE EFFLUENT TREATMENT.—The report of the Effluent Sub-Committee of the Manchester Rivers Committee was considered by a special meeting of the Committee on the 18th inst., and was practically adopted. The City Surveyor submitted estimates for various sections of the work, which amount together to about 127,000l., for covering thirty-five acres with bacteria beds. The Committee decided to begin operations with an area of four acres only.

THE WATER SUPPLY OF BIRMINGHAM.—On the 18th inst. Mr. C. E. Mansergh, C.E., delivered a lecture at the Royal Institution, Albemarle-street, on the bringing of water from Wales to Birmingham. Mr. Mansergh said the area of the city of Birmingham was 12,000 odd acres, and the limits of the supply covered over 83,000 acres, or 10 per cent. in excess of that of the county of London. The district varied very considerably in elevation, being 270 ft. above sea level in one place, and 800 ft. above sea level in another. The population was now about 700,000. In 1859 he was called in by the Corporation, and it was on his advice that the Corporation promoted the Bill of 1862 for the utilisation of the waters of the rivers Elan and Claerwen, tributaries of the Wye. The collecting area was 45,562 acres. Taking the mean of three dry years, the rainfall in one year would leave available 105,000,000 tons. He was satisfied they could obtain 75,000,000 gallons daily for their supply. The length of drought guaranteed against was 180 days, which necessitated a storage of 18,000,000,000 gals. A unique feature in the scheme was the provision of a submerged dam, to be built across the Cabanloch Reservoir, a mile and a half above the main dam, the chief object of which was to hold the water up behind it high enough to charge the aqueduct conveying the water to Birmingham. The scheme was such that it could be carried out in instalments, reservoirs being made as required. When the Caban dam was finished the total pressure against its exposed face would be 60,000 tons. Each dam when completed would be practically a monolith, only removable by some great convulsion of nature. In the lower parts of the valleys there was some cultivated land, which would for the most part be occupied by reservoirs, roads, and railway. The old manor house of Nantgwilt and Cwm Elan House, for awhile the residence of Shelley, with other buildings, would be "drowned."

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, MOSELEY.—At the Oxford-road Baptist Church, Moseley, a new memorial window in the chancel was recently dedicated. The window consists of two lights and tracery. The subject illustrated in the first light is the finding of Christ in the Temple. In the second, Christ is receiving and blessing little children. The work was entrusted to Messrs. J. Hardman & Co., of Birmingham, and carried out under the personal supervision of Mr. D. J. Powell.

FOREIGN.

FRANCE.—The death of M. Gignat has left vacant the place of Professor in one of the ateliers of architecture at the Ecole des Beaux-Arts. The candidates for the post are MM. Scellier de Gisors, Blayette, Deglane, Redon, and Chedanne. The Sevres manufactory has received the commission to execute a frieze in coloured stoneware for the façade of the large palace at the Champs Elysees. M. Joseph Blanc is to make the design. M. Falguere has been commissioned to execute a statue of the celebrated Dr. Charcot, to be erected at the place adjoining the Hospital of the Salpêtrière.—M. Mercier has just completed the statue of Alfred de Musset, but it is not settled yet where it is to be erected.—The Municipality of Paris is carrying on the works for the construction of a new Lunatic Asylum in the district of Ville-Evrard, near Paris. It will include twelve pavilions for men and eight for women, and will provide for 1,200 patients. This will be the fifth new establishment of this kind, and will be completed by 1900.—The French Government proposes to rebuild, on a larger scale, the National Conservatoire of Music. In the meantime the school will be temporarily transferred to the Caserne de la nouvelle France, near Rue Lafayette.—At Louin, near Poitiers, a funeral cave or sepulchre has been discovered, of the end of the fourth century, containing stone sarcophagi in which have been found various objects of considerable archaeological interest.—M. Loret has discovered, at Thebes, the tomb of Amenophis II., as well as a number of sepulchral objects—statues, vases, &c.—The death is announced of M. L. G. Coffiniers, of Nordeck, landscape painter, and a pupil of Meissonier, who also exhibited at the Salon Algerian subjects and genre pictures, as well as studies of mediæval life and

costume showing a good deal of research.—The death is also announced, at Limoges, of M. Louis Charles Gery, a former pupil of the Ecole Centrale des Arts et Manufactures, and who was architect for a good many churches in the Departments of La Creuse and Haute-Vienne. He also restored various religious edifices in the Limousin, especially the churches of St. Valere and St. Joseph at Limoges. He held the post of Diocesan Architect in that town, and assisted in the works at the cathedral and at the churches of Dorat and Solignac, which are classed as "monuments historiques." He was fifty-four years old. He had been, since 1894, a member of the Société Centrale des Architectes.

AUSTRIAN JUBILEE MONUMENTS.—The Jubilee fever is at present affecting Austrian architecture, as in 1887 and last year it affected the architecture of Britain. An imposing monument of the Imperial Jubilee is to be erected at Olmütz, in Moravia, with the sculpturing of which Professor Brenek, of Vienna, has been entrusted. At his suggestion it has been decided to adapt a monumental fountain beside the town hall, as the background to the memorial; an angel's figure is to be added, symbolising the advancement of the town of Olmütz; the figure is to point to the statue of the Emperor, indicating him as the author of the town's progress. An inscription is to be placed on the plinth of the fountain.

WORKING CLASS DWELLINGS AT THE PRAGUE EXHIBITION.—The universally-felt need for these buildings is to receive practical attention at the exhibition of architecture and engineering to be held this year at Prague. Section III. of Group A is to be devoted to the subject of homes for artisans, farmers, and officials, and is to consist of an exhibition of sketches, accompanied by clear explanations. To encourage the sending of these sketches, an open competition is announced, according to the *Wiener Bauindustrie-Zeitung*. Our contemporary, however, does not publish the details.

BOTANY.—At a recent meeting of the Botany Council the aldermen had under consideration the choice of a set of plans for a town hall, which they propose to erect on a site recently purchased by them, with a frontage of 100 ft. to the main road, and a depth of 350 ft. to a street at the rear. The site is in the centre of the borough. About a dozen designs were sent in, and the Council decided to award the first premium to Mr. B. Hadley, architect.

CALCUTTA.—A new block of buildings in connexion with the Calcutta General Hospital, and in its immediate vicinity, in course of erection. The designs of the new building were prepared by Mr. W. Banks Gwyther, A.R.I.B.A. Under Secretary, Public Works Department.

AUSTRIA.—The town of Korneuburg, Lower Austria, is to be lit with electric light. The development of the use of electricity in Austria is at present very remarkable; every week brings the announcement of new electric railways, cranes, light installations on a large scale, &c.—The site for the new theatre has been chosen at Graz.—New military buildings are to be erected in Marburg.—It is proposed to demolish the old lock-up in the Bartholomäusgasse at Prague, leaving only the interesting tower (a relic of the ancient fortification of the city). On its site a new lock-up, and other buildings for the use of the Department of Public Safety, are to be erected. Careful attention is to be paid to sanitation and to the complicated requirements of the department. The designing of the work is entrusted to Herr Ferdinand Havlicek and Herr Cjervinka, the former of whom will be occupied with the technical details, the latter with the superintendence of the works. Messrs. Fischer & Dvorjak are the contractors. The estimated cost is 110,000 florins, exclusive of site and fittings. It is expected that the building will be ready for its purpose in use of next year.—The town of Aussig is about to be enlarged. A considerable extent of ground is to be acquired for building sites, and a committee has been appointed to raise and administer a fund for the necessary works.—It is proposed to quarter an Infantry regiment at Hohenmauth, Bohemia, on October 1 next. For their reception an entirely new set of barracks is to be built. An orphanage is about to be erected in the same town under the management of the Convent of Notre Dame in Horazdovic.—It is proposed to build a new central porchhouse in Buda-Pesth, and the selection of a site is at present being discussed.—The plans for the proposed Agrarian Barracks have been finished by the architect, Herr Josef Holjac, and have been submitted to the municipal magistrate. The magistrate must now summon the joint committee, whose duty it is to pass or reject the plans. When their approval is ratified by the Minister of Public Defence the work will be put in hand at once. It is expected that the building will be roofed in next summer.—An exhibition is to be held in Steyr, Upper Austria, between August 18 and September 18, devoted to the industries of Upper Austria. The machines used in various departments of human activity will be shown. This exhibition will be held in connexion with the opening of the museum of arch-history and the permanent crafts exhibition in the new Industrial Palace.—The last date for receiving exhibits for the Brux Exhibition has been postponed from March 1 to April 1.—The quay at Linz is to be lengthened, and the

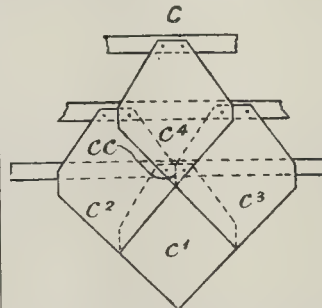
erection of two warehouses (one of them the property of the Danube Steamship Company), together with an electric crane, is to be proceeded with at once.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—In consequence of the late offices of the Metallic Paving and Artificial Stone Company, Limited, 86 and 87, Strand, W.C., being required for the performance of the duties of the new office of Sanitary Inspector, Amherley House, 12, Norfolk-street, Strand, W.C. **SANITARY INSPECTORSHIP, EDINBURGH.**—A sub-committee of the Public Health Committee of Edinburgh Town Council had under consideration on the 11th inst. the regulations to be enacted by the Magistrates and Council, as the Local Authority under the Public Health Act, for the performance of the duties of the new office of Sanitary Inspector. It was agreed to recommend that the salary attached to the office should be £400 per annum. In addition to the duties imposed by statutes and by orders issued by the Local Government Board, it is stipulated that the officer to be appointed shall perform any other duties which may be attached to the office by statute, by orders of the Local Government Board, or by order of the Magistrates and Town Council. Among other things, it is proposed that the new officer shall carry out the provisions of the Act of Parliament relating to common lodging-houses, the inspection of dairies, the sweeping, washing, ventilating, and painting of common stairs and passages, the provisions of the City Acts in regard to small dwelling-houses, and the provisions of the Shop Hours Act.

BUILDING TRADES FEDERATION, ROTHERSAY.—A meeting of the recently formed Bute Building Trades Federation, Rothersay, has just been held, Mr. William Stewart presiding. The report of the committee appointed at the last meeting was presented, and the constitution and rules adopted. The following are the office-bearers:—President, Dean of Guild McBride; Vice-President, Mr. William Hunter; Executive, John Lyle, William Lauder, W. M. Leckie, Matthew Duncan, Daniel Cunningham, John Cruickshanks, jun., and Wm. Stewart; Secretary and Treasurer, William McIntosh. The objects of the Federation as stated in the constitution are to encourage and maintain cordial relations between employers and operatives, and adjust differences that may from time to time arise; to secure united action in dealing with restrictive conditions sought to be imposed on the building trades; to secure recognition by architects, measurers, and others of a fair and reasonable form of contract between contractors and their customers; to secure the adoption of suitable rules for measuring work and the prompt and satisfactory adjustment and settlement of contractors' accounts.

NEW METHOD OF LAYING SLATES.—The Dublin Slating Company send us a copy of the patent specification for their method of laying slates, patented about two years ago, but hitherto apparently used only in Ireland. The diagram, with a quotation from the specification, explains the method and the advantages claimed for it. The slates are prepared by removing a part of the slate at two of the opposite angles (see diagram). "C1" is first placed in position and secured by nails as shown; C2 and C3 are placed side by side meeting at C4. C2 and C3 are likewise secured; C4 is then nailed. Thus where each C4 occurs, as at C4, a slate or tile is fixed under, as C1, and one over, as C4; the entire surface covered with the slates or tiles is then perfectly staunch and waterproof. The width of lap given to the slates can be varied as desired by



altering the size of the angles removed. The slates or tiles can be fixed either on laths or sheeting, and the position of the nail holes adjusted as desired. If the tiles are laid on laths, they are hung on laths by ordinary nubs and then nailed. The following example illustrates the saving in materials effected by the invention. In ordinary slating having a 3 in. "lap" 12 by 12 slate has a "cover" of 54 square inches; by using this invention a 12 by 12 slate with a 3 in. "lap" has a cover of 81 square inches. Thus there is a large saving in materials and conse-

quently much less weight to be sustained than in ordinary slating or tiling." We have not tested the calculation as to the area acquired, but the method certainly seems likely to make a compact roof with a strong bond for the slates. The cutting of the corners, however, is of course an item in the cost of labour which must be taken into account.

ARBITRATION IN ENGINEERING AND BUILDING CONTRACTS.—The Town Clerk of Dundee reported to a recent meeting of the Works Committee of Dundee Town Council that, as instructed, he had written to Edinburgh, Glasgow, and Aberdeen inquiring whether a neutral person was appointed to act as arbitrator, or whether the Burgh Surveyor or Engineer was appointed sole arbitrator, in engineering and building contracts for work to be executed for the Corporation. He read letters from the Town Clerks of Glasgow and Edinburgh, which stated that it was the practice to have a neutral person acting as arbitrator on all engineering and building contracts of importance. The Committee resolved that no arbitration clause should be inserted in any contract.

LEEDS STREET IMPROVEMENTS.—The Local Government Board have granted a Provisional Order for the construction of a street from Brigate through the Shambles into Vicar-lane, parallel with Kirkgate. The street, it is stated, is one whose cost, estimated at £100,000, is to be defrayed by the Leeds Estates Company, on account of the enhanced value the new thoroughfare will put upon their adjoining property. The only cost it will entail on the Corporation is 1,000l., the amount of sewerage and flagging.

THE LONDON COUNTY COUNCIL'S MONEY BILL.—The Council wide apart to Parliament in the following (with other) purposes:—To acquire a site for and to provide a Council Chamber and offices; provision of workshops, buildings, machinery, &c., for technical schools, precipitation, and other works at pumping stations and outfalls; sewerage works, including new main and relief sewers, sites for new building and enlarging lunatic asylums; purchase of White House, Hackney Marsh, the freehold of Fair-stead House, Waterlow Park, and of property for improving the eastern approach to Lambeth Bridge, and the northern approach to Tower Bridge, and widening the Strand and the south end of Tottenham Court-road; stations and sites for the verification and stamping of weights and measures, and the provision of standards and appliances; sites for Coroners' Courts; the acquisition and planting of open spaces; improvement of Evelyn-street, Deptford, Wood-lane, Hammersmith, Ben Jonson-road, and Blackstock-road, Islington; Highgate Archway, Barking-road Bridge and approach, and the reconstruction of the Isle of Dogs bridges; purchase of tramways; providing sites for stations, buildings, piers for river stations, new boats, and plant for new stations, and hydrants for the purposes of the Fire Brigade Act 1865.

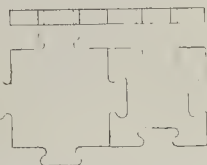
"AUTOGRAPHIC" COPYING PROCESS.—The Autographic Company (London and Middlesex) have produced what seems a new and useful process for the multiplication of writing, which can also be applied to drawings of a simple kind, hand sketches of detail, &c. The writing or sketch is done with prepared ink on a chemical paper, and faced down on a plate with an inked surface; the chemical of the paper "draws" the ink except where the line have been drawn, and the number of about 300 copies off on ordinary paper. The process is taken off on ordinary paper, and the number of about 300 copies off on ordinary paper. The process is taken off on ordinary paper, and the number of about 300 copies off on ordinary paper.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The usual monthly meeting of this Society was held at the library at the Museum, Queen-street, Edinburgh, on the 14th inst. The first paper, by Sheriff Mackay, LL.D., Q.C., F.S.A.Scot., was entitled "Notes on Queries on the Custom of Gavelkind in Kintyre, Ireland, Wales, and Scotland." In the second paper Mr. David Macritchie, F.S.A.Scot., discussed the question of the frequent occurrence in British topography of the words "man," "maen," "maiden," principally in place names applied to stones and rocks, and assigned the origin of these names in the majority of cases to the Cymric words "man," "men," or "mēdn," signifying a rock or stone. In the third paper Mr. A. G. Keir, F.S.A.Scot., Auchtermadar, gave an account of the state of the ruins of the Abbey of Inchaffray in 1789, compiled from the correspondence of General Hutton with Mr. John Dow, then the tenant of the Abbey. When Mr. Dow wrote, the only part of the Abbey remaining was the north gable of the house where the clergy lived. On the east and north-east side of the area stood the church and steeple. The latter fell in the end of the reign of Charles II. On the south-east side of the church was the burial ground. On the south side of the church was the house and the Abbots' house, to which water was conducted in leaden pipes from the Laxwell. On the west side were the houses of the clergy, and beyond them a fruit garden. The walls of the buildings were surrounded by a wall of ashlar work, and outside the wall by water. The access from the south being by a bridge over the Pow, a on the north by a stone causeway 60 ft. broad. The different parts of the monastery were pulled down at different times to supply material for

der buildings. In the fourth paper Mr. J. T. ne, F.S.A.Scot., gave descriptions of some sepulchral cairns discovered by the blowing of the sand, the sands of Bracon, in North Yell, Shetland, and a sculptured stone discovered at South Garth, the island of Yell, and subsequently lost. The s of the cairns were first made visible in 1862, Mr. Irvine made plans and partial excavations in 1863. In 1897 Mr. Irvine again visited the cairns, digging them further exposed to the depth of several ft., and made rough plans and notes to place the s on record, as the sand is beginning to creep er them again, and they will soon be covered up d forgotten. The sculptured stone found at South rth upwards of forty years ago was seen by Mr. omas Irvine at the peat bank where it was found, d is described by him as covered on both sides th figures of men and ornament.—*Scotsman*.

NORMAND'S "PARALLÈLE DES ORDRES."—The published copies of this book, referred to in our bond article of last week's issue, can be obtained m M. Thézard fils, 36, Grand Fitchfield-street. SURVEYORSHIP APPOINTMENT.—Mr. George een, recently Assistant Surveyor to the Islington stry, has been appointed Surveyor to the parish St. Martin-in-the-Fields, in succession to Mr. arles Mason, who resigned his appointment.

INTERLOCKING RUBBER TILES.—These tiles, of hich a sample consisting of a square of nine tiles t together has been forwarded to us, are appa- ntly an American patent, and are in very exten- ve use in the States, more particularly on railway tatforms and for the cabin floors of large steamers. e have received a comparative schedule of test- is and other flooring materials for wearing alities, as tested on rubbing wheels, and which gives a very high efficiency in that respect. We cannot course accept as conclusive a result of tests made x rle and in the interests of the patentees; but we are vertheless of opinion, from the examination of the



specimen submitted to us, that this is an exceptionally ood flooring material for the kind of purpose to hich it has been hitherto most applied. It combines hard and smooth surface with a remarkably good foothold; it would in fact be almost impossible to lip on it, while at the same time it appears to be washable like ordinary tiles. The diagram shows he manner in which the tiles are put together; hey can be made of various colours, and patterns an be wrought in them. It is a material which cer- ainly is worth the attention of English architects nd engineers. Mr. A. L. Gibson, of the Folding ate Company, is the agent in England for these les.

BRIGHTON BUILDING BY-LAWS.—At an ordinary meeting of the Brighton Town Council, held at the Royal Pavilion, on the 17th inst., the Improve- ments and Buildings Committee, in a special report, submitted a draft of amendments to the by-laws made by the Council on September 2, 1886, relating to new streets and buildings, and recommended that the same be approved by the Council and forwarded to the Local Government Board for their pre- minary approval. The Committee's recommenda- tions were as follow:—Sites and Foundations: 1. From and after the confirmation of these by-laws, the by-law numbered 17 of the series relating to new streets and buildings, confirmed by the Local Government Board on September 2, 1886, shall be repealed. 2. All mould shall be removed from the site of a domestic building, and the whole surface of such site shall be properly asphalted or covered with a layer of good cement or lime concrete rammed solid, at least 6 in. thick, provided that if the subsoil of such site be either solid chalk or solid concrete rock, it shall not be necessary to lay any such asphalt or concrete of greater thick- ness than 4 in. In this by-law the word "site" includes the whole surface of the ground which any building is intended to occupy or cover. Height and thickness of walls: 3. From and after the date of the confirmation of these by-laws, the by-law numbered 25 of the series relating to new streets and buildings, confirmed by the Local Government Board on September 2, 1886, shall be amended by adding to sub-section (b) of such by-law the follow- ing proviso, namely: Provided that where the top- most story comprises only a room in the roof extending over not more than two-thirds of the area of the floor of such roof, every external and party-wall of such building shall be 13½ in. thick below the first floor, and 9 in. thick for the rest of its height. Roofs: 4. In every building in which a room is constructed in the roof, such roof shall be close boarded, and covered with felt above the rafters, before the slating or tiling is put on. 5. Every person who shall offend against the foregoing by-laws shall be liable for

every such offence to a penalty of 5l., and in the case of a continuing offence to a further penalty of 40s. for each day after written notice of the offence from the Council. Provided, nevertheless, that the Justices or Court before whom any complaint may be made or any proceedings may be taken in respect of any such offence may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this by-law.—The ex-Mayor said he was sorry the Com- mittee did not see their way clear to go a little beyond what they were offering the Council that day. He quite approved of all they asked, but thought it would have been very much better if the whole of the by-laws had been gone into and many other very important improvements drawn up at the same time for the Council's approval. The report was adopted.

CAPITAL AND LABOUR.

THE STRIKE OF PLASTERERS, FLEETWOOD/ LANCASTRE.—The Fleetwood masters have agreed to give the advance applied for by the plasterers, and pay rod, per hour in future. The men asked that the rules shall not be altered under a two years' agreement, but the masters demurred. They contended that in case bad trade came it would be a hardship on them to have to pay the full rate of wages, say, for twelve months. They thought three months sufficiently long. The men, however, would not budge from the two years' agree- ment, and as several of the masters have important jobs to finish for the season they eventually gave in, and the strike is therefore at an end.—*Fleetwood Express*.

ABERDEEN PLASTERERS.—The operatives having threatened to strike on the 21st inst., the employers, considering the present position of contracts, con- ceded the demand of the men for a rise of 3d. an hour in wages. The whole dispute is now at an end.

JOINERS AND GRANITE WORKERS, ABERDEEN.—The parties in the dispute in the joiner trade have failed to agree on the terms of a reference to the Conciliation Board. The masters object to the demand for an eight-hours day and for an advance of wages from 8d. to 9d. per hour being included. The workmen will, however, carry the whole case before the Conciliation Board, but the employers re- serve power to act as they may consider necessary, whatever the finding may be. The offer of an in- crease in standard rate of wages from 6½d. to 7d. per hour, as from May 2, has been accepted by the stone-cutters in the monumental granite trade. It has also been agreed that granite polishers shall work only fifty-one hours per week, the same as stonecutters, and all questions as to the system and rate of payment for polishing are mean- time held in abeyance.

TREATED STRIKE OF LIVERPOOL JOINERS.— There is every likelihood that within two months Liverpool will be the centre of an exceedingly serious industrial dispute. The house joiners of Liverpool have just issued notices to the employers that unless on and after May 1 their rate of pay is increased from 9d. to 9½d. per hour they will "come out." A feeling of antagonism has been created between the men and the masters, and it is authoritatively stated that the latter will notify their intention of reducing the present rate of remuneration to 8½d. per hour. Alto- gether there will be close upon 8,000 men affected if the dispute attains an acute stage: while a number of building enterprises of great compass will be delayed, and probably injured. Within the past two years hundreds of houses have been built in the south and south-east extremity of the city, and have become exceedingly popular. In view of that fact many property owners and builders have this year already commenced to construct upon open land innumerable houses. House joinery has consequently become a most favourable industry, and the men now realise the opportunity has come of pressing a claim which has for some time been under contemplation.—*Liverpool Courier*.

PAINTERS' STRIKE, AYR.—The operative painters in Ayr have come out on strike. It is stated that the men demand an advance of 3d. per hour on the present rate of wages, and also that a revision be made as to the charges when working in the country.

STRIKE OF BLYTH PAINTERS.—On the 15th inst. Blyth painters came out on strike to resist the intro- duction of a new code of working regulations which the Masters' Association gave notice would be put into force. There are several points in dispute, but the chief objection is taken to the number of apprentices proposed to be allowed. The question of wages is not involved in the dispute.—*Newcastle Chronicle*.

BUILDING TRADE DISPUTES IN BLACKPOOL.—The building trade of Blackpool is again seriously threatened. The plasterers have been out on strike for three weeks, demanding a rise from 9d. to 10d. per hour. The employers have yielded owing to the pressure of contracts. Bricklayers are getting 9d. but want 10d. They come out on May 1, and the employers are determined to hold out. The position is very serious, as there are scores of houses in course of erection, besides the Alhambra Buildings.—*Liverpool Mercury*.

LEGAL.

INFRINGEMENT OF ANCIENT LIGHTS AT NEWMARKET:

CASE IN THE COURT OF APPEAL.

THE case of *Golding v. Wm. Reilly & Co.* came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Rigby and Vaughan Williams, on the 22nd inst., on the appeal of the defendants from a decision of Mr. Justice Stirling in the Chancery Division. The action was brought by the plaintiff, the owner of certain premises in High- street, Newmarket, occupied by Mr. Wm. Cresswell, a milliner, to restrain the defendants from inter- fering with the plaintiff's ancient lights, the alleged obstruction by the defendants being due to their erection of certain new buildings on the site of the old "Greyhound Inn," at Newmarket. The light said to be obstructed had access, prior to the erection complained of, to (first) a dwelling-house and shop facing the High-street, and (secondly) to a slant- ing roof and shop in the rear, and (thirdly) to a house still further in the rear, now converted into a shop. In the course of 1896 the defendants began to pull down the "Greyhound Inn," and in October of the same year began to build the new hotel, which was the building complained of, with the result that the walls facing the plaintiff's pre- mises had been raised 59 ft. from the ground. Mr. Justice Stirling, after hearing the evidence, came to the conclusion that the plaintiff's light had been sub- stantially affected, and granted a mandatory injunc- tion. He directed that the defendants must pay the costs of the action, except so far as they had been increased by the issue raised as to a small window at the back of the warehouse which costs the defendants would have as a set-off.

Upon the case being called on Mr. Butcher, Q.C., appearing as counsel for the appellants (the defend- ants), after consulting with Mr. Macnaghten, Q.C., counsel for the respondent (the plaintiff), stated that it had been arranged that the injunction should be dissolved, and that the defendants should pay his learned friend's client a lump sum for the obstruc- tion of light, such sum so paid to cover the costs both in that Court and in the Court below.

Their lordships assented to this, and an order was made accordingly.

THE ALLEGED INFRINGEMENT OF ANCIENT LIGHTS IN TUDOR-STREET, E.C.

THE case of the *Christian Herald* Company, Limited, v. Knight and others, which was reported in the *Builder* of the 19th inst., was again men- tioned to Mr. Justice Romer in the Chancery Divi- sion last week. It will be remembered that the case came before the Court on a motion by the plaintiffs for an injunction to restrain the defendants from building so as to injure or obstruct the plaintiffs' lights at their premises in Tudor-street, E.C., and his lordship granted an interim injunction restrain- ing the defendants over the 18th inst. from building so as to obstruct the light to six windows shown on the plan.

Counsel for the defendants now said that his clients were not ready with their evidence, and it had been arranged that the interim injunction should be continued over another week, the plaintiffs' undertaking in damages being continued, and the defendants also undertaking to file their evidence within a reasonable time.

Order accordingly.

BUILDING DISPUTE AT EAST FINCHLEY.

THE case of *Brown v. Ball* was mentioned to Mr. Justice North in the Chancery Division on the 18th inst.

Mr. Swinfen Eady, Q.C., said the case came before the Court on a motion by the plaintiff to restrain the defendant from erecting, or permitting to be erected, any building upon his land in Huntingdon-road, Bedford-road, or the Great North- road, East Finchley, in contravention of a covenant.

His Lordship: Is it a question of ancient lights? Mr. Vernon Smith, Q.C. (appearing for the defend- ant): No, my lord; it is with regard to a covenant as to the building line. I am willing to give an undertaking, without prejudice to any question, to abide by the covenant until the trial, costs to be reserved.

After some discussion, this undertaking was accepted, and the matter upon that undertaking stood for trial.

MEETINGS.

FRIDAY, MARCH 25.

Architectural Association.—Mr. T. C. Cunningham on "Constructional Steelwork." 7.30 p.m.
Royal Institution.—The Dean of Canterbury on "Can- terbury Cathedral." 9 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. H. O. Eulich on "Internal Governor Friction." 8 p.m.

SATURDAY, MARCH 26.

Architectural Association.—Spring visit to Lord Windsor's house, Mount-street. 3 p.m.
Royal Institution.—Mr. Lionel Cust, M.A., on "Portraits as Historical Documents; Portraits as Monu- ments." 1. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.

Edinburgh Architectural Association.—Visit to the Museum of Science and Art, Chambers Street.

Perth Architectural Association.—Second visit to Congregational Church, Kinross-street. 2.30 p.m.

MONDAY, MARCH 23.

Society of Arts (Lecture).—Professor W. N. Hartley, F.R.S., on the "Thermo-Chemistry of the Bessemer Process." III. 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Inspection at the Metropolitan Cattle Market, York-road, N. 3 p.m. Dr. Joseph Priestley on "Ventilation, Warming, and Lighting." 8 p.m.

TUESDAY, MARCH 23.

Institution of Civil Engineers.—Mr. E. W. Stoney on "Extraordinary Floods in Southern India; their Causes, and Destructive Effects on Railway Works." 8 p.m.

Society of Arts (Applied Art Section).—Sir Edward Maunde Thompson on "English Art in Illuminated MSS." 8 p.m.

Auctioneers' Institute.—Mr. Douglas Young on "London Traffic Problems, and their Solution." 8 p.m.

WEDNESDAY, MARCH 30.

Society of Arts.—Professor Silvanus P. Thompson F.R.S., on "Telephony and Space." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of the Directors. 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Disinfecting Station, Lots-road, Chelsea. 3 p.m.

THURSDAY, MARCH 31.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. E. T. Hall on "Sanitary Building Construction." 8 p.m.

Society of Arts (Indian Section).—Mr. Henry Luttman-Johnson on "The Earthquake in Assam." 4.30 p.m.

Society of Antiquaries.—8.30 p.m.

Royal Institution.—Professor J. A. Fleming, M.A., on "Recent Researches in Magnetism and Diamagnetism." V. 3 p.m.

Institution of Civil Engineers.—Students' Visit to the Great Central Railway Works, including the Terminus. Assemble at 210, Marylebone-road. 2.30 p.m.

FRIDAY, APRIL 1.

Institution of Junior Engineers (Westminster Palace Hotel).—Mr. J. T. H. Burrell on "Mechanical Refrigeration." 8 p.m.

SATURDAY, APRIL 2.

Architectural Association.—Fifth Spring Visit, to New Public Baths and Free Library, Pittfield-street, Shore-ditch. 2.30 p.m.

Institution of Junior Engineers.—Visit to the Thames Ironworks, Blackwall. 11 a.m.

Royal Institution.—Mr. Lionel Cust on "Portraits as Historical Documents; Portraits as Monuments." II. 3 p.m.

British Institute of Certified Carpenters.—Annual Dinner at the Bridge House Hotel, London Bridge, at 6 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until May 2.

1567.] 4,668.—**WIRE FENCING STRAINER:** T. Andry. A spool tapering to one end between the flanges has square ends, outside the flanges, placed across one another; a key to fit over the square ends, and flat along one edge, is placed over the end when the wire is wound tight with its flat side against the post to prevent slackening.

4,638.—**ATTACHING DOOR-KNOBS TO SPINDLES:** G. Beck. The use of screws or washers is dispensed with by means of a T or cross-shaped pin and a slotted and holed plate fixed to a revolving rose on the knob, or a loose slotted and holed plate can be used for any ordinary knob-rose.

4,618.—**TEACHING MODEL DRAWING:** J. Tomlinson. The apparatus consists of a skeleton frame of metal or wire around whose edge is soldered a long spiral spring of small wire, instead of acting as a spiral spring it forms a succession of independent single springs, of which any two together may form a clip spring—thus a piece of string can be placed in any position across the frame and the model's outline can be delineated.

5,609.—**MANUFACTURE OF WHEELS, PULLEYS, &c.:** H. Malin. Two circular plates clamp the disc of which the wheel is to be formed, their outer edges being so shaped as to form together a circumferential groove of the section required for part of the wheel's rim, with a roller carried by a rotating frame and bearing against the edge of the disc, and caused gradually to approach the disc's centre and to roll or upset the required flange thereon as the plate carrying the upsetting roller rotates around the disc and clamping plates.

5,947.—**SINK AND KINDRED SANITARY PIPES:** E. Evans. The inventor provides the outlet end of a sink or other pipe with a flap-valve, or loosely-hinged cover or lid, secured thereby by an adjustable attachment band or clip tightened up by nuts and bolts.

6,060.—**SLIDING SHAW WINDOWS:** A. G. Rider and E. Russell. The contrivance relates to that class of sliding-shaw window wherein, when the window is closed, the upper shaw is superposed upon and in the same plane with the lower shaw; a part of the inside lining of the box frame is so made that it may be opened; in the upper shaw the cord on either side is fixed to the centre of the frame by a plate let into the edge of the shaw, in the lower shaw the cord is fixed to an angle-iron plate at the bottom corner of the rail, the plate moving up and down a groove in the pulley stile, instead of the ordinary wooden parting slip, a wrought-iron angle-iron is provided for the lower shaw, let in, and screwed to the pulley stile.

7,062.—**BURCH-MAKING MACHINES:** T. Parker. For feeding the clay in a continuous mass or stream through the brick die or delivery tube there is provided a revolving drum whose periphery fits against the feeding trough; the drum has carriers which turn either outwardly or inwardly, in combination with a stationary cam, or cams, all being so arranged that as the drum revolves the carriers are caused to project into the feeding trough and carry the

clay round and force it along the trough and through the die or tube, when the carriers reach the die or tube they turn inwardly.

7,169.—**ROUGH CLOSERS OR LATRINES:** J. Shanks. The bottom of the trough is flat and rounded at the ends. The flushing water is made to enter through a transverse horizontal slot. The end of the trough at which the discharge takes place and the bottom are made with two concavities meeting in a middle ridge, and so cause the water to enter by two inlets.

7,200.—**DRAIN CLEANSING MACHINE HEAD:** J. Ephraim. This consists of a spear-pointed metal end having a helical or screw-like washers (preferably concave on their inner faces) grip the brush or plunger upon the reduced end of the rod section which is screw-threaded to allow of the use of different sizes of brushes and plungers.

9,206.—**WATER-CLOSETS:** S. S. Hellyer. The inventor's object is to make a water-closet suitable for use in cases where it is desired to obviate the necessity of disturbing or penetrating the floor, e.g., a fire-proof floor; the basin, or pan, is of only such a depth as will afford room beneath it, and between it and the floor, for the valve-box and syphon-pipe or trap. The support of the pipe trap, together with its descending limb, are made circular in form, so that the relative position of the outlet end of the basin, and valve-box can be adjusted to suit the position of the soil-pipe.

10,021.—**PIVOTTED WINDOW SHAWES:** J. Mahinson. The shaw may be revolved upon a vertical axis running centrally through it. Trunnions are attached to the top and bottom bars of the shaw and rest in sockets in the frame, the sockets consisting of a bracket with a hinged cleat, which is secured by a screwed stud, and when opened allows removal of the window: the window can be kept open at any desired angle by a perforated quadrant, into which drops a hook or catch.

10,901.—**COLOURED OR DECORATIVE EFFECTS ON PAPER OR OTHER SURFACES:** S. C. Anon. A fluid of oil-soluble pigments, when drops of oil are sprayed upon the surface, presenting beautiful interference colours, which, however, soon disappear. This invention relates to means of fixing these colours, so that they resist rubbing or other rough treatment. A solution is made of about 10 per cent. of a judicious bitumen in crystallisable benzine, with the addition of a few drops of essence of lavender or spikenard; a drop of the solution is allowed to fall on water in a vessel having paper or other suitable receptive surface, the benzine dries, and gives colours which, on running off the water, become fixed on the paper or other surface; the paper should be coated with gum, such as gum tragacanth, previously immersed in a solution of ammoniacal zinc chloride and dried. The coloured pellicle can be formed more slowly if rectified benzine is used as a solvent, the addition of essence of turpentine will retard evaporation of the solvent; brilliancy of the colours is obtained by adding a little collophony dissolved cold, and kauri gum will increase the pellicle's elasticity.

25,454.—**LEVEL FOR USE IN CONSTRUCTING IRRIGATION WORKS:** J. P. Giddens. A level beam is jointed at one end to the frame, and carries at the other end an indicating plate which slides in a graduated part of one of the uprights of the frame, the beam and plate can be brought to the required degree by means of a screw or other device. The level is supported between two pieces of wood, of which one is fixed whilst the other oscillates in the longitudinal direction of the apparatus, and is held by a clip.

NEW APPLICATIONS.

For week ending March 12.

5,595. Gorse and Probert, a Wire Nail, 5,588. E. W. Richmond, Gas Fires or Stoves. 5,514. Job and Others, Machine for Bronzing Paper, &c. 5,515. G. C. Brown, Hinging for Sliding-window Sashes. 5,526. H. H. Hobsen, Ventilated Siphon-traps for Water-closets. 5,521. E. J. Coxhead, and 5,787. J. Markham, Chimney-tops and Cows. 5,523. Boddy and Davidson, Method of Slatting Houses and other Buildings. 5,535. C. H. Hobsen, Manufacture of Shaped Articles from Veneers. 5,538. L. J. Dedecker, 5,540. Schluter and Lidemann, 5,567. Clayton and Steward, 5,560. J. Main, 5,540. W. Rowbottom, 5,508. J. Main and 5,525. T. R. Water, Drain-trap. 5,569. F. J. Gibbons, Reversible-Window Fastenings. 5,596. S. Bergmann, Electric Arc Lamps. 5,612. L. Mondron, Decorating Glass Panels for Covering Walls, &c. 5,629. G. W. Belian, Manholes, Inspection, and like Coverings. 5,624. G. T. Moore, Electrical Arms. 5,628. Grimshaw and Barnes, Cover for Tanks for Sewage, &c. 5,630. Walker and Others, Machine for Boring Tapered Holes. 5,633. G. P. Mathewson, Drainage Spring Traps. 5,636. Lugs, a Hollow Spindle Lathe Head-Stock. 5,645. H. Lowe, Flues or Hot-Air Chambers for Oil Cooking-Stoves. 5,652. W. O. Bailey, for Shaping and Bevelling Wood. 5,653. G. P. Mathewson, Drainage Spring Traps. 5,656. Lugs, and other material. 5,666. G. Hyde, Drain Holes and Gratings of Sinks, Drains, &c. 5,664. Langs, a Screw-Cutting Arrangement on Lathe Saddles. 5,668. H. Becker, Folding Doors. 5,671. G. H. Hall, Moulding and Pressing Bricks. 5,679. D. J. Roche, Shoots and Buckets for Cranes, &c. 5,676. J. Russell, Ashes, Asham and Others, Grinding, Crushing, Pulverising, &c. 5,682. J. H. Hall, Smoke-prevention. 5,683. J. H. Hall, Smoke-prevention. 5,684. J. H. Hall, Smoke-prevention. 5,685. J. H. Hall, Smoke-prevention. 5,686. J. H. Hall, Smoke-prevention. 5,687. J. H. Hall, Smoke-prevention. 5,688. J. H. Hall, Smoke-prevention. 5,689. J. H. Hall, Smoke-prevention. 5,690. J. H. 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geston.—27, 28, 29, and 30, Dunston-rd., f. 1, 781.
ley.—41 to 49 (odd), Botolph-rd., u.t. 64 yrs., g.r. 171.
wood.—19, Gipsy-rd., f. r. 304.
ton.—20, 21, 22, 23, Gladys-rd., u.t. 64 yrs., g.r. 171.
ton.—47, Knowler-rd., u.t. 64 yrs., g.r. 57.
r. 324.
ton.—17, Netherwood-rd., u.t. 99 yrs., g.r. 101.
ton.—22, St. James-st., f. r. 144.
By ERNEST OWENS (at South Hampstead).
nstead.—11 and 13, Gladys-rd., u.t. 93 yrs., g.r. 167.
39, and 55, Agamemnon-rd., u.t. 87 yrs., g.r. 181.
181, 182, r. 177.
Achilles-rd., f. r. 424.
land 28, Ullyses-rd., u.t. 82 yrs., g.r. 117.
land 28, Ullyses-rd., u.t. 82 yrs., g.r. 117.
March 11.—By H. DUKE & SON (at Dorchester).
chester.—Charles-st., 32 plots of building land, area 2 a. 2 r. 39 p. f. 1.
By ANLEY & CO.
litham.—1, Mount Ephraim-rd., u.t. 56 yrs., g.r. 167, tithes 18s., e.r. 100.
155, 156, 157, 158, u.t. 54 yrs., g.r. 64.
r. 42.
am.—25 to 33 (odd), Walham-av., u.t. 86 yrs., g.r. 204.
By J. J. KELP.
isham.—34 and 36, Mount Pleasant-rd., f. r. 184.
ney.—Crozier-rd., f. r. 84, u.t. 64 yrs., g.r. 225.
craton.—174, Chalgrave-rd., u.t. 76 yrs., g.r. 24.
e Newtoning.—139, Albion-rd., f. r. 364.
lon.—24 to 30 (even), Cornet-st., u.t. 661 yrs., g.r. nil.
By MOSS & JAMESON.
ill, Sussex.—Station-rd., a freehold building estate, 151 a.
150 to 156 (even), Weston-st., f. r. 1,504.
By E. & S. SMITH.
well Hill.—Muswell-rd., "Shirley" and "Park" 150, f. r. 504.
bury.—23, Balfour-rd., u.t. 51 yrs., g.r. 78.
March 14.—By CLARKE & CO.
lington.—26, 28, 29, and 30, Castletown-rd., u.t. 82 yrs., g.r. 704.
By E. H. HENRY.
e.—27, Moss Leard, f. r. 324.
1.—Hford-lane, two blocks of building land, area 20 a. 3 r. 32 p. f. 1.
By G. RAVENSHEAR.
Hill.—1, 2, and 3, High-st., u.t. 67 yrs., g.r. 204.
By T. WOODS.
Holborn.—No. 166, f. r. 654, reversion in 33 yrs.
164, "The Two Towers," f. r. 84.
By FORTESCUE & BRANSON.
r.—Berrymead-rd., f. r. 204, reversion in 85 yrs.
hall.—49, Auckland-rd., u.t. 67 yrs., g.r. 64.
64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Cathorn-rd., f. r. 324, reversions in 55 and 56 4,830
Cathorn-rd., f. r. 664, reversion in 74 yrs. 1,375
Cathorn-rd., f. r. 547, reversion in 56 yrs. 1,630
Cathorn-rd., f. r. 547, reversion in 56 yrs. 1,630
Cathorn-rd., f. r. 547, reversions in 56 and 74 2,410
Melina-rd., f. r. 124, reversion in 56 yrs. 140
Melina-rd., f. r. 64, reversion in 74 yrs. 140
By J. J. KELP.
Walthamston.—Greenland-rd., "Malvern House," u.t. 984 yrs., g.r. 34.
Leyton.—8 to 12 and 16, Belmont Park-rd., u.t. 97 yrs., g.r. 357.
Finchley.—40, Park Hall-rd., u.t. 90 yrs., g.r. 34.
Crouch Hill.—18, Sparsholt-rd., u.t. 48 yrs., g.r. 34.
Watford, Herts.—87 to 97 (odd), Southern-rd., f. By MORISON RICHES (at Clapham Junction).
Wandswoth.—14, 16, 18, and 22, Huntsmoor-rd., u.t. 92 yrs., g.r. 24.
81, 89, 93, and 95, St. Anne's Hill, u.t. 93 yrs., g.r. 267.
Tonsley-hill, f. r. 304.
Clapham.—92 and 94, Elphinstone-rd., u.t. 95 yrs., g.r. 167.
By HEPPER & SONS (at Leeds).
Leeds.—11, 12, and 15, Kilkenny, also the "Golden Cook" Hotel, and warehouse, cottages, &c., adjoining, area 1,776 yds., r. 850.
By BENTLEY & SON (at Askern).
Askern, Yorks.—"Moor House Farm," 27 a. 1 r. 0 p. f. 1.
March 16.—By ROBSON & PERRIN.
Holloway.—1 and 2, Summerfield-rd., u.t. 74 yrs., g.r. 124.
Stoke Newington.—133, Park-lane, u.t. 83 yrs., g.r. 124.
Hoxton.—61, Rushton-rd., u.t. 37 yrs., g.r. 47.
Ball's Pond.—5, 5A, 6, and 7, Mildmay-av., u.t. 89 yrs., g.r. 357.
By H. E. FOSTER & CRAWFORD.
Regent's Park.—5, Huntsmoor-mews South, u.t. 23 yrs., g.r. 57.
St. Pancras.—10, Woburn-buildings, u.t. 20 yrs., g.r. 108.
Holloway.—284, 286, 288, and 290, Hornsey-rd., u.t. 33 yrs., g.r. 327.
2, Andover-rd., u.t. 53 yrs., g.r. 64.
60 and 62, Victoria-rd., u.t. 36 yrs., g.r. 124.
58, Victoria-rd., with a cab-yard and farrier's shop, u.t. 30 yrs., g.r. 204.
By W. J. ORCHARD (at Berkhamstead).
Berkhamstead, Herts.—222 and 224, High-st., and 2 of an acre, f. r. 1.
An enclosure of meadow land, 34 a. f. r. 1.
West Ham.—27 to 37 (odd), Ranelagh-rd., f. r. 121.
2, Chapel-rd., u.t. 83 yrs., g.r. 34.
Forest.—36, Orwell-rd., u.t. 65 yrs., g.r. 24.
By MATTHEWS & MATTHEWS.
Bow Hill.—1, The Glen, u.t. 62 yrs., g.r. 127.
West Smithfield.—Long-lane, "The Old Red Cow" p.h., f. r. 1204.
By STIMSON & SONS.
Kensington.—48, St. Mary Abbott-rd., u.t. 61 yrs., g.r. 134.
Notting Hill.—12, Cambridge-gardens, u.t. 65 yrs., g.r. 84.
Chiswick.—19, Ashburnham-rd., u.t. 72 yrs., g.r. 72.
27, Burnaby-rd., u.t. 72 yrs., g.r. 64.
Stoke Newington.—53, Palatine-rd., u.t. 72 yrs., g.r. 124.
Walworth.—84, 86, 88, and 90, Date-st., and 11 and 12, Beckford-pl., u.t. 43 yrs., g.r. 404.
Camden-rd.—79, Boyson-rd., u.t. 53 yrs., g.r. 34.
By H. J. BLISS & SONS.
Mile End.—71 to 85 (odd), Buxton-st., and f. r. 124.
Hackney.—49, Balcombe-st., f. r. 284.
13, 14, and 15, Minson-rd., u.t. 484 yrs., g.r. 204.
Kensington.—83, Willes-rd., u.t. 55 yrs., g.r. 64.
Dalston.—87, Greenwood-rd., u.t. 63 yrs., g.r. 74.
Kingsland.—44, Stanley-rd., u.t. 63 yrs., g.r. 34.
Stratford.—10, Wadley-rd., f. r. 1.
Mayville-rd., &c., three freehold building plots, u.t. 66 yrs., g.r. 204.
Ayr, &c., Scotland.—A perpetual rent charge of 1,600.
Bradfield, St. George, Suffolk.—Freehold rent charges, 444, 74, 84, 94, 104, 114, 124, 134, 144, 154, 164, 174, 184, 194, 204, 214, 224, 234, 244, 254, 264, 274, 284, 294, 304, 314, 324, 334, 344, 354, 364, 374, 384, 394, 404, 414, 424, 434, 444, 454, 464, 474, 484, 494, 504, 514, 524, 534, 544, 554, 564, 574, 584, 594, 604, 614, 624, 634, 644, 654, 664, 674, 684, 694, 704, 714, 724, 734, 744, 754, 764, 774, 784, 794, 804, 814, 824, 834, 844, 854, 864, 874, 884, 894, 904, 914, 924, 934, 944, 954, 964, 974, 984, 994, 1004.
March 18.—By BAKER & SONS.
Lambeth.—Whitgift-st., "Palace Buildings," C, r. 2704.
Whitgift, f. r. 204, reversion in 90 yrs. 1,250
Fulham.—79 and 81, Horder-rd., f. r. 494.
Horder-rd., f. r. 84, reversion in 98 yrs. 210
By HANCOCK & BRADLEY.
Greenwich.—15, Ashburnham-grove, u.t. 49 yrs., g.r. 34.
Dulwich.—37 and 39, Lordship-lane, r. 804, also f. r. 134.
City of London.—17, Finsbury-pavement, f. e. r. 4504.
Holloway.—8, Tallington-pl., u.t. 62 yrs., g.r. 174.
Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. r. for estimated; u.t. for unexpired term; p. for per annum; y. for years; st. for street; rd. for road; &c. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		TIMBER (continued).	
Greenheart, B.G.	8/0	Satin, Porto Rico	0/6
Teak, F.I., load	9/0	Walnut, Italian	0/6
Sequoia, U.S.F.C.	1/8		
Am. Canada, load	2/10	Iron-Pig, in Scot.	2/5
Birch, do.	2/10	land	2/5
Elm, do.	2/10	Bar, Welsh, in	1/0
Fr. Dautic, &c.	2/10	London	5/10
Oak, do.	2/10	Do, at works	5/10
Pine, Canada	2/10	in Wales	5/10
Do, yellow	2/10	Do, Staffordshire	6/10
Do, white	2/10	in London	6/10
Do, red	2/10	COPPER—British	55/0
Do, yellow	2/10	cake and ingot	55/0
Do, white	2/10	best selected	55/0
Do, red	2/10	Sheets, strong	6/0
Do, yellow	2/10	Chill bars	5/10
Do, white	2/10	YELLOW MET. B.	55/0
Do, red	2/10	L.R.A.D.—F.I.G.	55/0
Do, yellow	2/10	Spanish	55/0
Do, white	2/10	English	55/0
Do, red	2/10	Sheet, English	55/0
Do, yellow	2/10	5 lbs. per sq. ft.	55/0
Do, white	2/10	and upwards	55/0
Do, red	2/10	Pipe—English	55/0
Do, yellow	2/10	Z.I.C.—English	55/0
Do, white	2/10	sheet	55/0
Do, red	2/10	Mon.	55/0
Do, yellow	2/10	Spelter	55/0
Do, white	2/10	TH—Strals	55/0
Do, red	2/10	Australian	55/0
Do, yellow	2/10	English Ingots	55/0
Do, white	2/10	Banca	55/0
Do, red	2/10	Billion	55/0
Do, yellow	2/10	O.I.L.S.	55/0
Do, white	2/10	Lined	55/0
Do, red	2/10	Coconut	55/0
Do, yellow	2/10	Do, Ceylon	55/0
Do, white	2/10	Palm, Java	55/0
Do, red	2/10	Rapeseed, English	55/0
Do, yellow	2/10	Do, Brown	55/0
Do, white	2/10	Cottonseed ref.	55/0
Do, red	2/10	Do, Black	55/0
Do, yellow	2/10	Do, White	55/0
Do, white	2/10	TAX—Stockholm	55/0
Do, red	2/10	Lubricating U.S.	55/0
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Do, yellow	2/10	Do, White	

LONDON.—For the erection of seven houses and two
Woolwich, for Mr. J. Hobson, Messrs. Church, Quicke
Whincop, architects :—

Proctor	£3,659	Sanford
Kitley	3,690	Thomas & Edge.....
Ware	3,657	



WILLIAM-STREET—Erecting manual training and science rooms, erecting two class rooms to accommodate thirty-two each, providing additional water-closets for girls, and enclosing, draining and re-paving the additional land (Second competition).—

Extra for backwork in cement.	
W. Whiteley	£4,375 10
Lewis & Co.	4,374 12
B. E. Nightingale	4,365 0
O. Craske	4,356 0
J. Carmichael	4,341 0
C. Wall	4,273 0
Lathley Bros.	4,272 0
Stimpson & Co.	4,267 0
H. Wall & Co.	4,258 0
E. Triggs	4,251 0
Kirk & Randall	4,245 0
Johnson & Co., Limited ..	4,249 0

YERBURY-ROAD—Painting interior —
McConnick & Sons

Stevens Bros.	£534 0
W. Horne	584 0
T. Cuiwys	528 0

Supply of wheelbarrows on a running contract —
Each.

O'Brien, Thomas & Co., Ltd.	£1 0
Pyrie & Palmer	1 4
Northfield & Sons	1 0

TENDER BOX —
J. H. W. Martin

5 T. Cuiwys*	£10 0
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* Recommended for acceptance.
Painting the exteriors of the following schools:—

ADYS-ROAD —
H. Lenny

F. Chisley	£167 6	W. Hornett	£124
J. Simpson & Son	14 10	W. Chappell	110
Bristow & Eatwell	145 2	Marchant & Hirst	107
Wm. Whiteley	129 15	F. T. Chinchin*	205

BALDWIN-STREET —
E. Lawrence & Sons

J. Jackson & Son	109	A. W. Deady	12
J. F. Holliday	155	D. Gibb & Co.	12
A. White & Co.	245	G. Baker	1
J. Kybett	244	S. H. Confield*	8

BELL-STREET —
F. Chichey

Mt. Vernon & Sons	118	Gardner & Hazell	8
W. Silk & Son	95		

BETTS-STREET —
E. Jackson & Son

G. Wales	109 9
<hr/>	
"FORSTER":—	

CANONBURY-ROAD —
W. H. Wastell & Sons

"FOX":—			
"Unsigned".....	£218 0	W. R. & A. Hide	£73
Lathey Bros.	154 0	W. Brown	67

FAIRFIELD ROAD —
J. F. Hainley

GALLEYWALL-ROAD:-						
Johnson & Co.	£240	0	0	W. Banks	£175	14
A. White & Co.	235	0	0	E. Triggs	147	15
C. S. Jones	225	0	0	W. Brown*	135	15

"FORSTER" —
F. Britton

£131 0	Bristow & Tatwell	£133 13
Gardner & Hazell	124 0	Stevens Bros.
McConnick & Sons	140 0	

"FOX" —
"Unassigned"

TEAK, VENEER, and TIMBER MERCHANTS
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL
HATTON GARDEN, and 29, RAY STREET.

GALLEY-WALL-ROAD —
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The Architecture of our Large Provincial Towns.

XIV.—HULL.



HULL, or Kingston-upon-Hull, as it has been officially designated from the time when Edward I. took the place under his special patronage, is a town with a long and distinguished history, yet singularly lacking in anything which appears to attract the ordinary traveller. Among the large towns of England it is literally unique in being situated on an absolutely flat and alluvial plain, only just raised above the high-water level of the great river-mouth or estuary called the Humber. One very happy consequence of its open, wind-swept situation is that for a town numbering upwards of 100,000 inhabitants, and containing a good many manufactories—oil and colour-mills especially predominating—it is singularly clean and free from smoke. There is absolutely no appearance of the smoky pall which perpetually hangs over several of our great inland cities, and the streets as a rule are as clean as those of an ordinary little market town of a few thousand souls. Without extending the parallel too far, it is no exaggeration to say that that particularly tidy, cheerful, well-to-do look always associated with the towns of Holland, is also to a very large extent characteristic of Hull; and in spite of an unquestionable monotony, there is really much that is pleasant and to a considerable degree interesting about the place. The earlier importance of Hull as a seaport is to be traced to the convenient haven, for craft of former days, afforded by the narrow, but deep and slow-flowing river from which

it takes its name. The commonly-repeated story that the town was founded *de novo* by Edward I. is not strictly true. There was undoubtedly a village already existing in the angle between the two rivers, referred to in twelfth and thirteenth century documents as Wyke, Wyke-upon-Hull, and sometimes Hull only, as at present. This was the property of the monks of Meaux Abbey, from whom Edward acquired it by exchange in 1293, and immediately gave it the new title of Kingston-upon-Hull, making it a royal manor, under the administration of a warden and bailiffs, responsible only to himself. His object in this was to secure the absolute control of the port, both for military purposes and on account of the commerce which he rightly conceived might be developed there. But we cannot quite agree with the statement in Turner and Parker's "Domestic Architecture" (vol. ii., chap. v.) that Hull belongs to the class of towns specially designed and built by Edward I., like New Winchelsea and the *bastides* of Guienne. The Old Town, the original Hull, can never have shown the rectangular setting-out characteristic of those towns, and was not fortified until late in the reign of Edward II., and then by the inhabitants themselves, under an ordinary "license to crenellate." The line of these fortifications, which remained the boundary of the town until about a century ago (enduring two sieges in the Great Civil War, when, as at Leyden, the whole of the surrounding country was laid under water by the defenders), forms a prominent feature of the present town; the three oldest docks having been made by successively deepening and enlarging the original ditch, which stretched in a nearly semicircular curve from river to river, so that the Old Town is actually an island. In this island, now entirely a business quarter, and reminding one of the City in

the daily exodus from it at six o'clock, the only remains of mediæval Hull must be sought. They are not many: one large church, one small one, and a few neglected and perishing remnants of inns and private dwellings, practically form the list. The street-names throughout this district, however, greatly assist in picturing the former aspect of the town; it is comparatively easy to trace the gradual westward growth and filling up of vacant spaces, starting from the original Hull-street, afterwards called High-street, at first a single line of houses following the bank of the river, which for centuries remained the abode of the merchants, with their homes close to their wharves, while the more open region towards the landward walls was chosen for the foundation of churches, monasteries, and the buildings of the guilds. The Church of the Holy Trinity (see lithograph), which from its foundation (some time in the thirteenth century, and pretty certainly anterior to the reputed "foundation of Hull" by Edward I.) has always been the principal church in the town, is a large and dignified but not otherwise remarkable structure. It cannot, as some guide-books claim for it, be actually considered the largest parish church in England in spite of the recent elevation of some of the larger ones to cathedral rank, those of Yarmouth, Coventry, and Boston exceed it in area; but it is unusually lofty, both in nave and chancel, for a church of that class, and may fairly be called one of the most imposing in the country, in spite of some obvious weaknesses in its design. The actual history of the church is obscure, and this is hardly the occasion to attempt to unravel the archaeological puzzles connected with it, though one interesting fact is certain, that we may see in the walling of the chancel and transepts, built in all probability in the first half of the fourteenth century and of local materials, some of the earliest mediæval



Exchange Buildings. (Mr. W. Botterill.)

brickwork in England; the great flowing tracery windows of these parts of the church are well known, and have been often illustrated. Of the much smaller Old Town church, St. Mary's, the true history is also beset with uncertainty; what we see at present is clearly only a portion of the original building, and the most striking feature, the tower (see lithograph), which in its outline is suggestive of the tower of Magdalen College, Oxford, is an entirely modern work, designed by Sir Gilbert Scott.

As the most convenient starting-point for a general survey of the town we may take the Victoria Pier, the landing-place of the ferry-boats bringing passengers across the Humber, from Lincolnshire. This pier comes about midway in the line of docks which stretch along the banks of the river for about four miles, and is within a short distance of the confluence of the Hull and Humber, the probable site of the earliest beginnings of the town. The row of houses facing the broad quay is called Nelson-street, and presents nothing remarkable amongst the offices and hotels of which it is composed; though, turning up into Queen-street, the Pilot Office, at the corner on the left, with its look-out place on the roof, reminds one of the chief occupation of the place, with a feeling of regret that a building so suggestive in its character, should yet have about it so little of the picturesque. In Queen-street the first prominent building is the Corporation Market Hall, opened in 1887, the plans for which were begun in the Borough Engineer's Office, but the work carried out by Mr. W. A. Gelder. The street fronts offer plenty of variety, both of composition and materials, and the Corporation, who are said to have spent 20,000*l.* upon the building, may be credited with the desire of producing an interesting piece of street architecture; the general effect, however, somehow fails of being pleasing, chiefly from a coarseness and want of proportion pervading the details, which renders the description "designed in the Flemish Renaissance style," distinctly inappropriate;

nothing of like character was ever erected in Flanders, and it gives rather the impression of a *pot-pourri* of modern English work of the few years preceding its erection. Continuing along the Market-place, a fairly wide street, but not a *place*, or open space, in the ordinary sense, the site of the old market-cross, at the junction with Mytongate, is marked by a conspicuous equestrian statue of William III., by Scheemaker; the king appears in the guise of a Roman general, and both man and horse are brightly gilt from head to foot. Just beyond this the high east end of the church of the Holy Trinity rises sheer from the pavement, without any intervening churchyard; to enter, it would be necessary to turn down one of the narrow lanes, South or North Churchside; but the church having been already noticed, we now keep to the main street, soon coming to the Post Office, the work of Mr. Williams, and dating from 1877. This is of the usual official stamp, cold and commonplace modern Italian in design, and only too good and permanent in execution; Spinkwell stone, apparently, having been employed.

We now enter the region where the principal banks and commercial offices are congregated. At the corner of Lowgate (as the line of the Market-place here begins to be called, the other portion being anciently called Highgate), at its junction with Silver-street, the York City and County Banking Company have a large stone building with a corner entrance, designed by Mr. W. Botterill in 1870; the florid and rather coarse variety of Venetian Renaissance adopted is characteristic of the period of its erection, but it has, at all events, a thoroughly bank-like appearance. At the next corner, on the same side, the Royal Insurance Buildings, of much later date, by Messrs. Smith & Brodrick, show a more refined type of Renaissance, based upon French models; here all the string-courses and cornices are of small projection and delicately moulded, and the main cornice is altogether omitted wherever gables rise above

the general eaves-line; the whole treatment is well adapted to a narrow street, and is aided in effect by the pleasant colour of its creamy stone, as yet undarkened, and red granite plinth; a rather pretty oriel is corbelled out over the main entrance, which, as in a great many instances in the neighbourhood, is placed at the canted angle. Almost opposite, another kind of contrast is provided in the large block occupied by the Yorkshire Fire and Life Insurance Company and by the Hull Club. This, also the work of Messrs. Smith & Brodrick, is a Gothic building, partly early French, partly Venetian in its inspiration, and carried out in stone and red brick. The detail is less coarse and better subordinated to the scale of the building than is usually found in imitations of those styles, and the general aspect, rich, without becoming too "busy," is decidedly satisfactory. The Exchange, at the corner of Bowlalley-lane, built in 1865, by Mr. Botterill, is a large pile of buildings of greater commercial than architectural importance. Besides the Exchange proper, a large hall not indicated in the design of the exterior, it contains numerous offices of public companies and private firms, a restaurant, &c.; it is built of grey stone and white brick, has two longish fronts, the angle being turned into a quadrant with a prominent corner entrance, and, in general appearance, is heavy, dull, and respectable. Coming in this direction along Lowgate, the tower at the west end of St. Mary's Church, added by Sir Gilbert Scott, forms a strikingly picturesque object, standing out, as it does, in an unusual manner, right over the footway, which is carried through the open arches of the lowest stage; its effectiveness is much increased by the greenery of the little churchyard opening out from the street just before the tower is reached, and forming, with the church on one side, the vicarage (a Gothic building by Sir Gilbert Scott, mainly of red brick) on another, and the club just mentioned on the third, a kind of quadrangle. Of the church itself we have already spoken. A



Wilberforce House, High-street.



Old House, Dagger-lane.



Trinity House.



Custom House.

the way beyond, and rather hidden by the street, is the Town Hall (lithograph), by Mr. Brodrick, the architect of Leeds Town Hall; it is particularly badly situated for getting a general view of its exterior, as, although usually isolated and in plan rectangular, it has architecturally only one visible front, and that is part of the general line of a comparatively narrow street, without even a cross street from which the building could be seen in a distance. In spite, however, of this drawback, the Town Hall is by no means unimpressive, while it looks its character roughly. It does not command even the smallest quarter of the town in the manner that some municipal buildings dominate an entire city, but when it is once seen, its location is unmistakable. Not only in the exterior, but inside also, the general massing and modelling are far superior to the treatment of parts considered separately; it gives an impression of being the work of a man with a talent for the higher branches of design considerably above the average, but not in a bad school, so that a really notorious conception has been somewhat redeemed by the commonplace quality of details. Colour has entered to some

extent into the design; outside, the Portland stone hue of the general walling is relieved by ranges of red Mansfield pilasters and columns (unfortunately badly weathered and bleached to a pale, weak tint); while inside, besides the use of coloured stones and marbles, a very complete and on the whole satisfactory scheme of painted decoration has been carried out, embracing the entrance hall, the grand staircase, and all the principal rooms. These decorations were designed in the first instance by Mr. Lewis F. Day, nearly twenty years ago; some of his original work remains, and is, as might be expected, both interesting and appropriate; much of it, however, has lately been repainted, and although some effort has been made to follow the character of the older work, the general harmony has been somewhat marred. The marble statues of Edward I. and of eminent citizens of the town, by various sculptors, which adorn the hall and staircase, deserve mention, some being fairly successful works.

Rather behind the Town Hall, in Broadley-street, we may notice the Kingston Gas Office, by Messrs. Smith & Brodrick, an example of a favourite modern fashion of a profusion of low-relief plaster work, applied in this case

to a front of mixed red brick and stone, producing a result decidedly florid; and then may turn through Salthouse-lane into High-street, which runs almost parallel with Low-gate and the Market-place, between them and the River Hull. Though still, from a business point of view, an important locality, this street, the history of which has been noticed in describing the growth of the town, looks very different from the ordinary High-street of a provincial town. It is, in fact, a narrow lane, only just wide enough for two carts to pass at a walking pace, with the pavement represented in many places by a mere curb, and bordered on one side chiefly by warehouses, and on the other by offices; from it run off smaller lanes called "staiths," almost as narrow as the Yarmouth "rows." High-street, however, still teems with associations recalling the early history of the port, and the lives of the merchant-adventurers who built up the greatness of Hull; many of the dingy-looking offices contain splendid staircases and rooms adorned with excellent woodwork and plasterwork, showing them to have once formed part of dwellings which may fairly be called princely. One of the best-preserved of these has become a special show-place

from the circumstance of William Wilberforce having been born there, though the history of the house goes back for at least a century earlier. This is the building standing a little back, with a forecourt separated from the street by an old brick wall with high gate-piers; the house itself has curiously rusticated brickwork on its front, and a roof covered, like those of all the older buildings in the town, with red pantiles. There is good seventeenth-century panelling inside, and although now used as offices, the occupier, it ought to be said, is most obliging in the facility which he allows for its inspection. Nearly opposite, at the entrance to Bryant's-court, some half-timber houses, much be-plastered, appear to be of early seventeenth-century date. At Temple's Entry, a little further on, there is a fine half-timber front, belonging to what was once the King's Head, a celebrated inn; the timbering is still visible, and there are good carved brackets at the doorway, supporting an oriel. This house has a double projection of the upper stories, and was probably built in the fourteenth century. Several other remains of half-timbered houses exist up and down the street, but all in a much more damaged condition. No. 160, known as Maister's House, from the family of that name who formerly lived in it, is a really remarkable, and, on the whole, very well-preserved, example of a sumptuous town mansion of the time of George II. The exterior is severely unpretentious, but the richness of the interior is quite surprising. The central staircase, with its two tiers of surrounding galleries, and gracefully-designed octagonal lantern, could hardly be surpassed by any work of corresponding date; the iron balustrades, though somewhat singular, are full of character, and the whole of the woodwork is exceptionally fine. Most of the latter has, unhappily, been grained, and the effect of the delicate mouldings and carving nearly ruined thereby, but the general condition of the house appears so sound that it may be hoped that some one may think it worth while to come to the rescue with a judicious "restoration." Among other houses possessing good interior work of the seventeenth and eighteenth centuries may be mentioned Nos. 47, 49, and 66, while No. 44 has a noticeable brick front. Among modern buildings which attract attention are the Corn Exchange, by Messrs. Bellamy & Hardy, of Lincoln, with a heavy Corinthian front of dark stone; the Globe warehouse, by Messrs. Botterill, a strong, solid-looking, red-brick building of six stories, thoroughly "warehouse" in character without affectation; and Phoenix Chambers, by Mr. Jacobs, a corner block of offices with a canted angle, built of red brick and buff terra-cotta, and treated in a manner very suitable to its position in a narrow street.

Returning to the banking quarter, we find in the appropriately-named Silver-street the offices of the London and Midland Bank, a tall stone building, plain and substantial, yet not quite banklike in aspect, by reason of the smallness of the ground-floor windows, and the great prominence given to those of the first floor. Facing it is an arcade of shops, L-shaped in plan, and communicating with Lowgate at the other end. At the corner of the short street bearing the strange and apparently unexplained name of Land of Green Ginger, the London and Yorkshire Bank, by Messrs. Smith & Brodric, a rather striking building in red brick and stone, shows an adaptation of early French Gothic; it has a corner entrance, with the rounded angle of the upper stories corbelled out over. Just opposite the building of the Colonial and United States Mortgage Company, by Mr. R. Clapp, of florid modern Renaissance type, is prominent, but hardly pleasing; turning down Land of Green Ginger, No. 7, Messrs. Shackle's office, by Messrs. Smith & Brodric, claims notice as a piece of well-designed work; it is entirely of red brick, except some plain stone lintels over the principal windows, and treated



Royal Institution. (The late Cuthbert Brodric.)



Hull and Sculcoates Dispensary. (Messrs. Botterill, Son, & Bilson.)

simply and sensibly throughout, with proper regard to materials and situation; though a small and unostentatious house, it is one of the most interesting and satisfactory commercial buildings in the town. Bowlalley-lane contains some large office blocks of no special merit, and we turn back into Silver-street, where, at its junction with Trinity House-lane, is a large and costly-looking building, just completed by Mr. W. W. Gwyther, of London, for the Yorkshire Banking Company; Ancaster stone is used for the facing, dark red granite for the plinth, columns, and entrance-arch, and an imposing result was evidently contemplated; unfortunately, however, the entire design is hard, mechanical, and uninteresting, strongly recalling the work done by the Post Office surveyors. The Trinity House in the same street, at the corner of the open space before the west end of Holy Trinity Church, is a very pleasant specimen of mid-eighteenth-century architecture, built in 1753-4. It is very quiet in effect, a two-story building with simple dressings and quoins of dark grey stone, between which the walling is plastered

and painted cream-colour, all ornament being concentrated on a doorway of well-proportioned Roman Doric, and on the central pediment, which is filled with remarkably vigorous and appropriate carving, quite of the old man-of-war's figure-head type, representing the Royal Arms, supported by the stoutest, sturdiest, and most defiant-looking lion and unicorn ever seen, with Britannia and Neptune, equally boldly executed, in the angles; it is recorded that 100*l.* was paid for the carving of this pediment in 1758. Across the square is the venerable building which, for several centuries, was the Grammar School; it was built in 1578-83 (though the school had existed for a long time previously), and is entirely carried out in brick, even to the mullions and transoms of the windows. Several other examples of old brickwork, showing a free use of moulded bricks, still exist in this part of the town, such as the quaint little seventeenth-century house (now stuccoed over) in Dagger-lane. In Whitefriargate, the principal street leading out from the Old Town, and containing some of the best shops, we pass the office of the



Flour Mills. (Messrs. Gelder & Kitchen.)



Girls' Industrial Schools, Park Avenue. (Messrs. Botterill, Son, & Bilson.)



The Grosvenor Hotel. (Messrs. Gelder & Kitchen.)

House, some of the warehouses and mills are quite worth notice as works of architecture, notably Pool's warehouse, designed by Mr. J. King James, and the St. George's Mill. The view looking up the river from the North Bridge, where these tall buildings are seen rising sheer up out of the water, is really picturesque. Below the bridge Rank's Mill, by Mr. Gelder, is imposing from its huge bulk and immense chimney with head of glazed brickwork. An inn's sign near the bridge, "The Greenland Fishery," recalls the days when whaling was an important occupation of Hull seamen. In Witham, leading out to the eastern suburbs, the most striking building is a Wesleyan Chapel, with a tetra-style Ionic portico of vast dimensions, and built up of unusually large blocks of stone. A little Roman Catholic Church in Wilton-street, by Messrs. Smith, Brodrick, & Lowther, has some pretty features, but is practically ruined internally by its coarse and glaring painted decoration, applied in such a reckless manner as to seriously obscure the architectural design and to totally destroy all difference of quality in material. The Holderness-road is now entered on, a wide street with many new buildings rising along it; among these should be mentioned the James Reckitt Public Library, by Mr. Gelder; the Corporation Baths, designed in the Borough Surveyor's office, and still in progress; St. Andrew's Church, by Messrs. Adams & Kelly, commonplace in design, and almost inconceivably bad in detail, consider-



Higher Grade School, Craven-street. (Messrs. Botterill, Son, & Bilson.)

at it was built only twenty years ago; just off the main road, in Craven-street, her-grade Board school, by Messrs. Hill, Son, & Bilson, similar in general character to those already mentioned, but of a more effective external design, and without doubt, after, of course, Hymers & Co., the most satisfactory example of architecture in the town.*



The Manchester Arms.
Messrs. Smith, Brodric, & Lowther.)

NOTES.

ON Tuesday we had the subject of the Government offices again discussed in the House, Mr. Herbert Gladstone informed the House that it would be so much better if buildings were to be designed by the Office of Works, and cited the Gothic of the new portion of the Office as an evidence of Sir John Lubbock's ability to do better than any of the architects of the country. It would seem that First Commissioners of the House (for Mr. Gladstone at one time held the office) are selected specially for their sense of architecture. The good sense of the House was contributed by Mr. Bryce, who drew attention to the great importance of building in the new Public Offices for the various departments, such as would be the several departments—a suggestion which we hope will not be forgotten, Sir F. Powell, who seemed fully to appreciate the importance of the completion of the new Kensington Museum.

THE following letter appeared in Wednesday's *Times* :—

NEW GOVERNMENT BUILDINGS.

To the Editor of the *Times*.

I, the undersigned, who follow various branches of art, are naturally anxious that the building schemes proposed by the Government should result in something that would represent the architectural ability of the

country, and, therefore, heard with dismay the statement in Parliament of the First Commissioner and the leader of the Opposition. Their criticism of Mr. Norman Shaw's New Government Office seems to render it almost hopeless to expect anything from the present scheme but another architectural failure.

A series of illustrated articles was begun in our issue of November 26, 1896. A list of those towns already visited, and particulars of future arrangements, will be found on page xvi.

We desire to place on record our admiration of Mr. Shaw's building, and our opinion that of the public buildings erected by Government in London during the present generation it is the one of which London may be most justly proud.

Your obedient servants,

T. G. JACKSON, R.A.	H. H. ARMSTEAD, R.A.
L. ALMA-TADEMA, R.A.	J. C. HORSLEY, R.A.
ARTHUR W. BLOMFIELD, R.A.	FRANK DICKSEE, R.A.
W. BUTTERFIELD, F.S.A.	VAL. C. PRINSEP, R.A.
E. ONSLOW FORD, R.A.	G. H. BOUGHTON, R.A.
JOHN BELCHER	ERNEST CROFTS, R.A.
THOS. BROCK, R.A.	J. MAC WHIRTER, R.A.
PHILIP WEBB	BRITON RIVIÈRE, R.A.
JOHN S. SARGENT, R.A.	WALTER W. OULESS, R.A.
W. R. LETHABY	ERNEST GEORGE
HAMO THORNYCROFT, R.A.	JOHN FULLEYLOVE, R.I.
WALTER CRANE	WALTER CAVE
JOHN F. BENTLEY	J. T. MICKLETHWAITE
GEORGE FRAMPTON, R.A.	PHILIP NORMAN
	HALSEY RICARDO
	BASIL CHAMPNEYS

It seems rather a pity, while they were about it, that the signatories did not say a word as to the general principle of the manner in which Government deals with architecture, instead of merely confining themselves to repudiating the judgment passed on the Scotland Yard building. Still, this is what may be called a good "test case"; members of Parliament have committed themselves to abusing a building which the majority of architects and artists of the day would point to as the best public building of the last fifteen or twenty years; and the perusal of the list of names at the foot of the letter may perhaps persuade even Sir William Harcourt and the First Commissioner that they have been pronouncing judgment on matters they do not quite understand.

Electricity and the Metropolitan Railway.

THE clause in the Bill of the Metropolitan Railway Company for the purpose of enabling them to use electricity has been passed by the Select Committee of the House of Commons. The only opposition to it was from the Great Western Railway Company, who were apprehensive that their interests would be affected. This was clearly a question of arrangement between the two companies. But we are afraid that, though the Bill will be passed this session, the public will have some time to wait before the change is complete. It is obvious that, with the best intentions, a change of this kind must take time, and as it is admitted that the change is primarily for the benefit of the public rather than of the shareholders, it is not likely to be put through with rapidity. It is certain, however, in the long run to be to the advantage of the company, since more persons will then travel by the underground lines. If the companies would light their stations by electricity, without delay, so as to give a clear light, it would be a great public convenience. At present, the stations throughout the underground lines can scarcely be said to be lighted: there is darkness visible.

New Church, Montmartre.

THE crypt of a new church at Montmartre, Paris, has just been completed and opened for service. The building, at the intersection of Rue Véron and the Passage de l'Elysée des Beaux-Arts, and with a façade towards the Place des Abbesses, was commenced last year; it is dedicated to St. Jean, and is intended for the population of Lower Montmartre, for the access up the steep hill to St. Pierre is long and inconvenient. M.

de Baudot, Inspecteur-Général of Diocesan Buildings, is carrying out the work, which will be executed entirely in iron framework filled in with hollow bricks into which liquid cement is poured. It is the first church in Paris to be built in this form of construction.

Magnetic Ore Concentrators.

ONE of the most remarkable of the industrial processes that have become established during the latter end of the nineteenth century is the extraction of certain metallic ores from their native bed by means of magnetism. For some time past Mr. Edison has been running a large plant at Edison, in New Jersey, where an immense quantity of low grade magnetite exists. After the rock in which the iron ore occurs has been reduced to powder, the magnetite is attracted away from the sandy gangue by means of large magnets, and is then made into briquettes for treatment by the iron producer. The bulky by-product of sand is said to have found much favour with American builders on account of its clean and angular grains; it is also utilised as sand for locomotive engines, and for other purposes. The Wetherill magnetic machines concentrate not only magnetite, but many other metallic ores that until recently have not been regarded as magnetic materials. Thus it has been found possible to attract hematite, limonite, pyrolusite, siderite, and many chemical salts of iron, manganese, and chromium, from their admixture with non-magnetic minerals by means of magnetism. In fact, the sulphides of iron appear to be the only compounds of that metal which cannot be extracted by this process. Space will not permit a detailed account of this new adaptation of electromagnetism to the service of man, but fuller particulars may be found in the proceedings of the principal chemical and engineering societies during the last two or three years especially those of America.

The Cost of the Electric Light.

THE paper on the cost of generating and distributing electrical energy, an abstract of which was read by Mr. Robert Hammond at the Institution of Electrical Engineers last week, is an excellent one. It represents the results of an immense amount of labour in tabulating and arranging the various items of cost in generating electricity at the several supply stations in the United Kingdom so that they are readily comparable with one another. This was rendered possible by the Electric Lighting Act of 1882, which makes it compulsory on the part of every lighting station to publish an annual statement of its accounts, giving the various items in minutest detail. As the paper takes up 132 pages of the Society's transactions and yet has been condensed to the utmost consistent with clearness, we can do no more than mention one or two of the points touched on. Mr. Hammond proves that the cost of electricity supply has been and is still gradually decreasing, and that it has not yet become simply proportional to the price and calorific value of the coal used. For example, the "works costs" per unit sold last year at Edinburgh, Leeds, and Manchester were only 0.63d., 0.78d., and 0.94d. respectively, and the total costs per unit sold were 1.13d., 1.50d., and 1.45d. Mr. Hammond, who designed the works at Leeds, ventured to predict that

when the output of these works was five times what it was at present then the works costs would be reduced to a halfpenny per unit sold, and the total costs would be only three farthings, so that a penny per unit to the consumer would be then quite possible. The author's remarks on depreciation, specifications, tests of the efficiency of generating plant, &c., embodying as they do the results of his almost unrivalled experience are well worth considering by all engineers. In the subsequent discussion Mr. Wordingham, of Manchester, stated that the Corporation now only charged 1½d. per unit for motor purposes, and for lighting purposes their charges were practically the same as those at Brighton.

THE Bishop Suffragan of Bow Church. Stepney makes an appeal, which is supported by the National Trust Society, for a sum of 3,700*l.* (whereof 900*l.* is at present subscribed) for a restoration of this church, erected in the fourteenth century, and consisting of a tower, chancel, nave, and two aisles. Having already described the architectural features of the fabric and its condition in our article of November 21, 1896, we need only say now that the Restoration Committee have adopted plans prepared, we understand, by Messrs. W. A. Hills & Son for execution under the superintendence of Sir Arthur Blomfield, who in 1891 carried out, at a cost of about 350*l.*, some interior repairs, and has since drawn up a report upon the existing state and needs of the structure. The church was originally built as a chapel-of-ease for Stepney parish on a license granted by it, seems, Ralph de Baldock, who was Bishop of London in 1306-13; in 1719 the chapel was consecrated for use as a parish church, with a dedication to St. Mary. It contains some interesting monuments, and has some old Flemish glass; the eight bells are believed to be those cited in a familiar nursery rhyme. A curious tradition obtains that children's bodies used to be deposited in a loft above the chancel roof.

ON Tuesday evening Sir E. Maunde Thompson gave an interesting lecture at the Society of Arts on the subject of art in English illuminated MSS., treating it as presenting a kind of epitome or representation of the artistic progress of the country during the medieval period. He recognised two main types of art in illuminated books; the northern, which was of more or less Celtic character, and depended for its effect mainly on conventional ornament and grotesque animals, and the southern, in which figure subjects were predominant. A very interesting chronological series of illustrations was given with the lantern, which formed a kind of summary of the progress of and changes in the art, and brought out especially the curious development of conventional foliage designs and their sometimes rapid and almost sudden changes in style. The lantern illustrations could not of course show the colour which is the most important element in illumination, but they showed at all events the design. In regard to the figure subjects, while they are no doubt historically interesting when seen as a series, we cannot keep up with the lecturer's admiration of many of them for their own sake. They are

interesting experiments by artists who meant to express something serious, but whose figure drawing was grotesquely bad. The only figure shown that was worth admiration from the modern point of view was the one, from an example of late date, of the angel in the Revelations casting a millstone into the sea. This is a grand design *per se*; the others are only admirable in their intention, making large allowances for the incapacity of the draughtsman; and it is an ill-regulated enthusiasm which regards them as pure works of art.

OWING to some oversight, as M. Lachenal informs us, in regard to communications to the Press, our attention was only drawn almost at the last moment to the exhibition of his ceramic work at the Hanover Gallery in Bond-street, which has closed this week, and has hardly attracted the public attention it deserved. The name of M. Lachenal will be familiar to the readers of our notes from France as that of an eminent French ceramic artist; not a manufacturer merely, but one whose productions are all his personal work, in design and modelling. The collection at the Hanover Gallery was an interesting one, curiously different from anything of the kind that one generally sees in London. It consisted largely of pieces of ware for decorative effect merely, not for use; some of them with a little too much suggestion of the "article de Paris" about them—for instance, the bowl of which the sides are formed by a procession of ducks in a circle; but many others distinguished by great originality of inventive fancy, besides beauty of colour and execution. One of the largest pieces, a crouching female figure with her back to the spectator, apparently repulsing a crowd of evil countenances, forming a bas-relief behind, is a really poetic conception. There were various charmingly modelled heads; a large grey vase with two female figures in alto-relief floating, as it were, on the ground of the vase; some splendidly-modelled and coloured birds, and a crowd of smaller objects of varied and fanciful invention. The pervading taste of the collection is not what would commend itself, perhaps, to the purists of English decorative art, but it is interesting as representing the French view of what can be done with decorative ceramic work; of the high talent displayed in the work there could be no two opinions, and it is well to be led out of our usual groove sometimes. Next time M. Lachenal exhibits in London, we hope his work will have more attention than it seems to have secured on this occasion.

WE thought Mrs. Allingham's had arrived at perfection in her art, but in this last exhibition of her works, now on view at the Gallery of the Fine Art Society, she has surpassed herself. With each new exhibition her work seems to have gained in refinement of perception and execution; and though some of the seventy-six drawings now exhibited may be picked out as more remarkable than the rest, there is not a thing with which a fault can be found. Such a work as "Near Staunton St. Gabriels, Dorset" (23) seems the perfection of landscape representation in water-colour—so true in effect as to be almost an illusion to the eye, and yet entirely without "realism" in the wrong

sense of the word. The peculiar excellence of Mrs. Allingham's style lies in the fact that she has learned to combine almost minute truth and correctness of representation with a perfectly broad and free style of handling. Among other drawings which may be specially mentioned are "A Primrose Copse" (2), "Cottage near Farringford" (14), where one is struck especially by the truth of colour and texture in the green thatched roof, and the minute execution of the figure and animals near the foreground "At a Cottage Gate" (17), "By the Lilla Tree" (24); "Old Manor House Kent" (35), a larger work than usual, and a fine study of a grey old half-timbered house; "Feeding the Pigeons, Whittington Court" (45), a charming picture made by a child in a white frock relieved against the shadow of the open doorway; and "On Blackdown" (68). These are among the finest in the collection, but we might have picked out a score more.

A COLLECTION of studies of sea and shipping, by Mr. W. Wyllie, under the title, "Foul Weather from a Floating Studio," on view at Messrs Dowdeswell's gallery. The "foul weather," as in "The mouth of the Thames" (47) and "North Sea Trawlers" (43), has the best of it as far as the sea is concerned: the calm sea subjects seem a little wanting both in regard to colour and to what one may call liquid quality in the water. A large number of the sketches are concerned with shipping as well as sea, and in painting shipping Mr. Wyllie is without rival among English artists; one of the most characteristic is "Barge race entering Medway" (77). The collection is well worth a visit.

THE Spring Exhibition of paintings at Mr. Maclean's Gallery in the Haymarket contains nothing so remarkable as the Roman Gladiator subjects by Gerôme in the last exhibition, and in fact most of the works exhibited are of rather a commonplace order. The most important is Bouguereau's large painting of a nymph and cupids under the title "Whispers of Love," suggests that Bouguereau would be one of the greatest artists of the day if his colour was as fine as his drawing. The most characteristic and original pictures exhibited are the two larger works by Ter Meulen, "Ming the Flock" and "The Wood-cropper's Return," which are really fine. An Egyptian scene by Gerôme, and Mr. Brangwyn's clever but eccentric painting of the crew on "The Custom House Quay, Venice" rather what the French call a *croûte*—among the works exhibited.

THE "Société des Aquarellistes Français," which has hitherto held its annual exhibition at the Georges Petit Gallery, has this year migrated to the gallery in the Avenue des Champs Elysées. The exhibition is an exceptionally interesting one. Among the best works is M. Maurice Leloir's picture of the Pont au Change in the eighteenth century. M. Jean Geoffroy exhibits some amusing studies of infants from life. Boutet de Monvel, who also excels in representations of child life, affects rather a manner of the "Primitifs"; in this class work his illustrations to the fable of

er, his son, and the ass, are exceedingly voracious. Among other things to be noted are the broad and vigorous drawings M. Guiraud de Scévola, the studies by M. nard of Sara Bernhardt in one of her roles, the military caricatures by M. Albert Blaume, the drawings by M. Jeannot, and some of the works in water-colour by talented artists—Meissonier, Gustave Doré, Delbuth, and Louis Leloir. It may be observed in regard to the general character of the objects treated this is a curious contrast to what we are accustomed to see at an English water-colour exhibition, where landscape almost always predominates.

WE are glad to find that the East Ham Public Offices Competition. East Ham District Council have acted on the suggestion in our issue, and have withdrawn the word "probably" from the sentence in their advertisement in reference to the appointment of a professional assessor, and that it is the intention of the Council to appoint an assessor. They will get a much better competition under those circumstances.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The annual meeting of this Society is held at the Albert Hall, Leeds, on the 21st inst., when Mr. George Corson, who occupied the chair, was re-elected President, and Mr. Tweedie and Mr. T. Butler Wilson were appointed Vice-Presidents. The members elected to the Council were Messrs. Hobson, Braithwaite, Ince (Bradford), W. Carby Hall, Beever, H. Howdill, G. W. Atkinson, and A. E. Kirk, together with Messrs. E. Birchall, W. H. Orpe, E. J. Dodgson, Perkin, Bulmer, and Watson (Wakefield), past-Presidents. Mr. F. Bedford was re-elected secretary.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—At a meeting of the Glasgow Architectural Association on Tuesday—the President, W. T. Conner, in the chair—the Rev. David Watson delivered a lecture on "Pavis de Chavannes, and the Mural Decoration of Municipal Buildings in France." The lecturer gave an exhaustive criticism of the artist and his art, characterising Chavannes as the greatest mural decorator of modern times. His most important works were very fully illustrated by limelight slides. At the close, Mr. Watson expressed the hope that the municipality would, in the decoration of their Municipal Buildings, employ M. Chavannes to initiate the scheme of mural decoration.

COMPETITIONS.

SCHOOLS, WADEBRIDGE.—For the Memorial Schools at Wadebridge, Cornwall, fourteen sets of designs were received from different architects, and those prepared by Messrs. Grey and Ellis, of Exmouth, have been selected. Tenders for carrying out the work are being invited.

NEW FREE CHURCH, ABERDEEN.—In the latest competition for designs for new Free Church, Beechgrove-avenue, Mile End, Aberdeen, the professional assessor (Mr. J. Murray Robertson, Dundee) has now reported. Messrs. Brown & Watt's (architects, Aberdeen) plan has been considered the ablest, and they have been appointed architects for the building; while the first premium is awarded to Mr. A. Marshall Mackenzie, A.R.S.A., and the second to Messrs. D. & J. R. McMillan, architects, Aberdeen. The selected plan shows a church in Kemnay granite, seated for 800 persons, with a hall at the east end to accommodate 400 people. A feature of the building will be a tower and spire—total height, 175 ft. (tower 104 ft., and spire 71 ft.). Messrs. Brown & Watt have also introduced large windows in the church. The estimated cost of the new buildings is 8,000l.

REBUILDING OF BOSCOMBE HOSPITAL.—The plans submitted by Mr. G. A. Bligh Livesey, R.I.B.A., architect, Boscombe and Bourne-mouth, have been awarded the first premium in this competition. The assessors were Messrs. Young & Hall, of London.

Illustrations.

WALTHAM ABBEY.

THE Abbey of Waltham Holy Cross owed its foundation, according to legend, to the miraculous discovery of a fint cross, having the image of the Saviour, at Montacute in Somersetshire. When found it was placed in a waggon drawn by oxen, which, on the mention of Waltham, commenced their journey eastward to the banks of the Lea, where Tovi, then lord of the soil, and standard-bearer to the King had property, and a house. The cross was set up, and became an object of great veneration, and Earl Harold, brother of the Confessor, founded an establishment here for Secular Canons, and dedicated the church to the Holy Cross. This dedication was coupled with that to St. Lawrence in the time of Henry II.

The architectural history of the abbey may be divided into two periods—firstly, the building of its church and the foundation of a house of Secular Canons by Earl Harold before the Conquest, dedicated in 1062; and secondly, its remodelling by Henry II. in 1177 as a monastery of Canons Regular of the Order of St. Augustine, the changes that were made at this time, and the subsequent additions and alterations down to the time of the Dissolution of the Monasteries.

We cannot in the space at our disposal go into the question which has been much discussed from time to time, as to whether the Norman work at present existing is or is not a portion of Harold's church. Mr. Parker, Mr. Freeman, and more recently Mr. J. A. Reeve have given their views at length, and to their papers we refer our readers. Harold's church was of some magnificence in its detail, if not remarkable for great size, and the theory that the Norman style might very well have influenced him in his design would in some measure account for the distinctly Norman detail of the nave now existing, considering the time at which it is supposed to have been built. That there is no documentary evidence or allusion to any rebuilding in Norman times is also another point in favour of the theory that we still have left some of the early church. The extent of the presbytery of this date can only be conjectured. It was in all probability apsidal. The late Wm. Burgess made a plan shewing a presbytery of four bays with an apse, and beyond it a small apsidal chapel, with two side chapels, as at Gloucester and Norwich, approached from the ambulatory. This plan has been adopted by the Ordnance Survey in their map of Waltham. There is, however, no architectural evidence to support this theory. All the data we have to go upon are the remains of the "crossing" and transept and the existing nave. The central tower was 35 ft. square, carried on four richly-moulded arches. The length of the transept was comparatively short. The west wall of the south transept still exists, and, assuming it had no eastern chapels, its width would be that of the central tower. The nave was of seven bays, and over the aisles in the westernmost bays were probably towers. The former existence of these is evident by the thickening of the wall at this point. Foundations have been discovered on the north side of the nave, and two doorways, one Norman, and the other (that at the east end of the north aisle, now the entrance to the modern vestry) of fourteenth century date, show that buildings stood on what is now part of the garden of the vicarage, and probably formed part of the first establishment of Secular Canons founded by Harold.

The second period—that commencing in 1177, with its conversion by Henry II. from a house of Secular Canons to one for Canons Regular of St. Augustine—has, if fewer architectural remains, considerable interest.

In a paper by Mr. Edmund Littler, written in 1859*, on Waltham, a plan is given showing foundations, which are described as having been found "twenty-two years ago." These foundations we have shown on the large ground plan. They consist of a broad foundation wall running from the junction of the north transept with the presbytery to a distance of about 130 ft. eastward. At this point is a garden wall, built with old materials, and running at right angles with the foundation described. A little distance further south, and in a line with the old wall of the south aisle,

was another foundation or fragment of wall. There is little doubt that these are fragments of the presbytery as remodelled. Whatever the plan of Harold's presbytery might have been, and however much of it was retained within, there seems no doubt that the later extension, after it had become an Augustinian house, had a square eastern termination. Partly, possibly owing to the existence of buildings already on the north side of the nave, but more probably owing to the close proximity of the town, the cloister of the new monastery was placed on the north side of the presbytery, and in this point may be compared with the planning at Rochester, where the cloister was on the south side of the presbytery. The whole of the site of these monastic buildings is now known as "Abbey Gardens," but by carefully examining the site, and with the assistance of the general plan given, which has been based on the Ordnance Survey, it will not be difficult to fix the position of the various buildings. The extent of the cloister court is probably accurately marked by the present garden wall, making allowances for the position of the presbytery aisle, which encroaches on it on the north. Immediately opposite the church, on the north side, was the frater, kitchens, &c., and at the north-east angle of the court there still remains a building which is undoubtedly of Henry II.'s time, and formed an approach or passage to the cloister from the north. Its west wall was the east wall of the frater, and at its north-west angle are traces of a staircase. A wall of varying thickness, with traces of arches of later date, runs for a considerable distance south of this passage, and marks the east wall of the cloister. On this side was the chapter house, and at its northern end, near the passage already described, is a thick wall running east and west, pierced with windows of apparently much later date, with broad inner splay.

The Abbot's house might have occupied the west side, and the outer court, with its chief entrance, was to the north-west. This gateway we shall refer to again. The vaulted passage is of two bays, each 14 ft. square, with the vaulting remaining in a very perfect state. At its north-west angle is a wall running north for a distance of 19 ft., at which point are traces of another return wall on the east side, showing that the passage was originally probably almost double its present length.

The thirteenth century has left no mark on any of the buildings that now exist. But during this period the presbytery of the church was doubtless much enlarged. Harold's presbytery was probably destroyed to make way for a new presbytery, such as is indicated by the foundations already referred to, and in accordance with the plan adopted by the Canons Regular of St. Augustine. The "Lady Chapel"—probably referring to the chapel dedicated to the Virgin at the east end of this new presbytery, was dedicated in 1188 by William de Vere, Bishop of Hereford,* and there is a further record of a dedication in 1242, which probably marks the completion of the work.

In the fourteenth century the west front was rebuilt, and late in the century a chapel, dedicated to the Virgin, was built in the angle formed by the junction of the south transept and south aisle of the nave.

The west front, when perfect, must have been a very fine composition. From foundations quite recently discovered north of the present tower (see plan), it seems clear that the Decorated front followed pretty nearly the same lines as the Norman front. At the angles of the aisles were double buttresses, gabled and canopied above, and carrying octagonal turrets. In the centre was a large doorway, flanked by an arcade. This was divided from the aisle by massive buttresses as a support to the main Norman arcade. The aisle walls themselves had a circular window with curious tracery high up at each end, apparently more used to light the passage in the thickness of the wall than for lighting the aisle itself, and above, the wall was finished with an open quatrefoil parapet. Traces of the west window can still be seen in the east wall of the present tower. The central doorway is a very beautiful composition, ornamented with ball flowers and roses. Over is a crocketed gable. The tower built, in the reign of Queen Mary, against this front has covered up a good deal of its detail. We give illustrations, however, of the west end of the south aisle and the western doorway, and reference to the plan will show the probable planning of the front

* "Transactions of Essex Archaeological Society," vol. ii.

* Gentleman's Magazine, April, 1865, p. 384.



when perfect. In its lower stages the present tower appears to be built rather against the front than actually bonded into it, and much may still exist behind. Above, however, the new work overlaps, and is bonded more into the Decorated work, so that it is now impossible here to recover the original design of the upper part of the front. The materials used were flints and clunch, and brickwork has been introduced in places. These materials occur again in the Lady Chapel, which is of slightly later date than the west front, although in all probability it formed part of one scheme of design.

It is two bays in length, each bay subdivided by lesser buttresses and lighted by two windows. At the west end is a large square-headed window. The chapel measures 42 ft. in length and 21 ft. in breadth, being thus a double square. It was apparently never vaulted, but it is raised on a vaulted crypt, in good preservation but much disfigured by vaults, and by being used partly as a coal store. It is 8 ft. in height from the present floor to the crown of the vaulting ribs. The chapel was restored in 1860 by the late Wm. Burgess, and the tracery of the windows on the south side is entirely new, but part of the work in the beautiful west window is original. This window shows in the illustration of the front of the south aisle. The entrance is now at the west end near the south-west angle, and is approached by a flight of eight steps. The crypt entrance is at the north-west corner. At the period of the building of this chapel the Norman wall of the aisle was pierced by a large arch, and two of the Norman windows blocked up.

Nothing of importance seems to have been done in the Perpendicular period. In the church there is one window of late Perpendicular character in the north aisle, and the remains of the screen with its two doorways, under the west arch of the "crossing," is, ap-

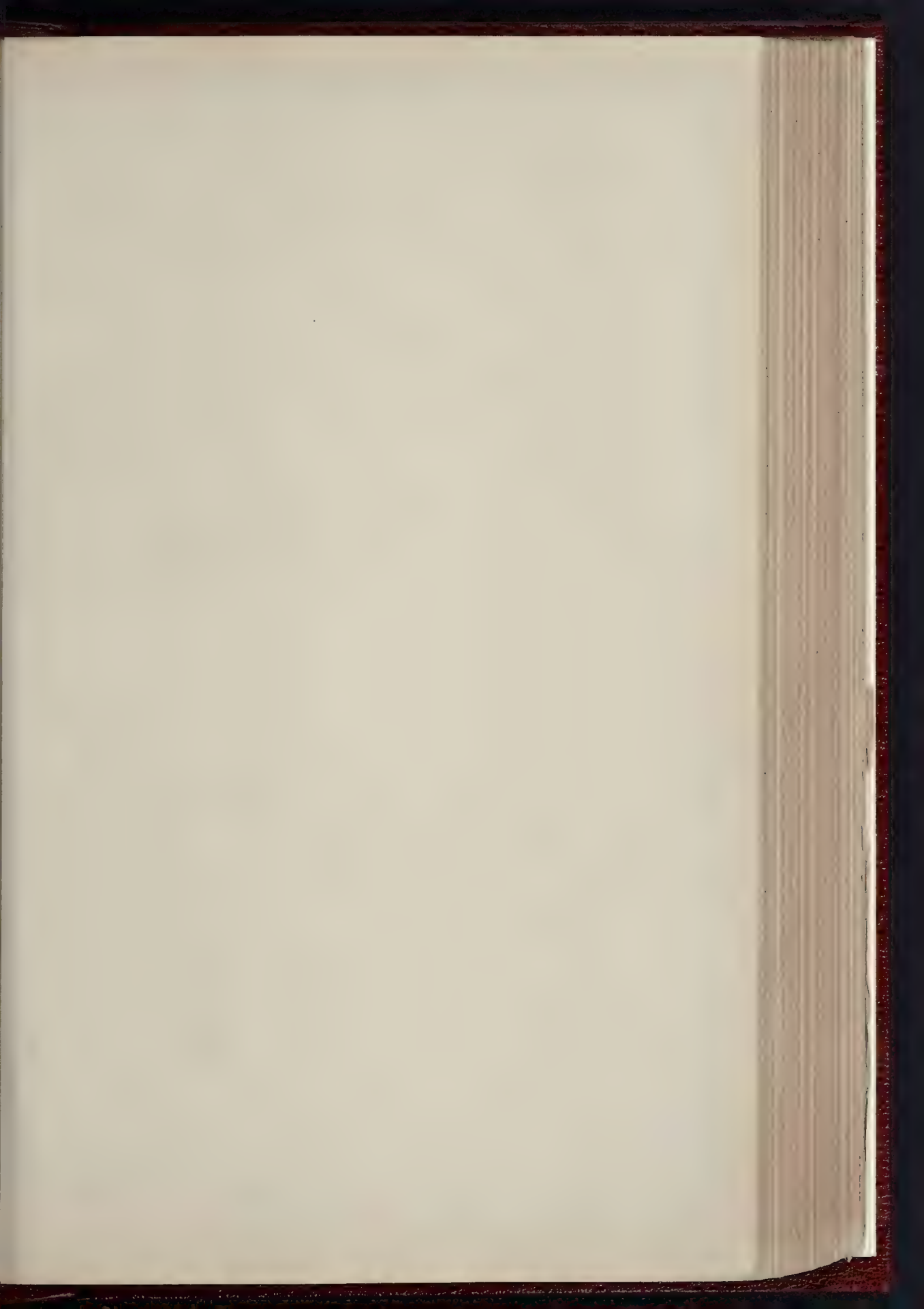
parently, of fifteenth century work. The main entrance to the monastery, approached by a bridge (modern) across the mill stream, about a hundred yards north of the west front, is of early Perpendicular work. Two walls remain, the front pierced by two four-centred arches, large and small, and the south wall with a blocked doorway in its centre leading to the room on this side. At the junction of these walls, at the south-west angle, is an octagonal turret. This, on the ground level, has a small window commanding the approach, and just below it are to be seen the remains of an original bridge and its parapet. An upper chamber remained at the beginning of the century, and there was a corresponding turret at the north-west angle. The label terminations have angels holding shields. That on the south bears the arms of England and France quarterly, but is much mutilated. The charge on the other shield has entirely disappeared.

At the Dissolution the presbytery and transepts of the church, and the monastic buildings were destroyed. The nave, used as the parish church, with its altar against the screen wall under the west arch of the crossing, was retained, and the Lady Chapel adjoining it, which in later times was used as a school, as was the case at the Abbey of St. Alban. To this retention of the lady chapel we owe the preservation of the west wall of the south transept against which it was built.

The central tower fell, and a western tower was built, in the time of Queen Mary, largely with old materials, and with a Decorated doorway, probably brought from some destroyed portion of the church or monastery, inserted. In 1778 the belfry seems to have been taken down, but was restored in 1798. In 1860 considerable repairs to the church were carried out by the late Wm. Burgess. The east wall (under the west arch of the "crossing") was rebuilt in a style altogether out of keeping

with its surroundings, the Lady Chapel was repaired and its windows restored, and the second pier of the south nave arcade, from the east, was largely rebuilt, it having sunk owing to defective foundations. The present flat ceiling of the nave is also of this time, with painted panels by Mr. now Sir, Edward Poynter, P.R.A. Since that period a reredos has been added at the east end, and a memorial screen introduced (1886) in the large arch between the nave aisle and Lady Chapel.

The general design of the nave is shown in the interior view, taken from the south-east angle of the south aisle in front of the Denmark tomb, looking north-west. The chief points to be noticed are: the flutings of the great columns, said to have been at one time filled in with brass; the absence of the inner order of the triforium arcade, formerly carried by the centre column which at present supports nothing; the variations in the design of the Norman work in the clearstory; and the treatment of the two westernmost bays (one of which shows in the view between the columns). In the fourteenth century the arch of the arcade was removed in these bays, and a segmental arch thrown across to support the clearstory. Besides being ugly in itself, it considerably weakened the walls, as is evident by the general tendency to lean westward visible in this part of the church. The south aisle also is considerably out of the perpendicular, but this is probably owing to bad foundations. In the wall of the triforium of the second bay from the "crossing" is still a portion of the beam on each side, which probably carried a "Rood." A screen of "Decorated" date spans the north aisle at this point, and two steps lead up to a higher level. On the opposite side, if the wall is a recess, the original use for which is not apparent. During the restoration, however, some fragments of either a reredos or tomb were found in this recess, and they have been built into the east wall of the south aisle. They are of beautiful Decorated work, of clunch, and much resemble the work in the Queen Eleanor and Crouchback tombs in Westminster Abbey. Near the south doorway, and in the north wall of the west tower, are several fragments of very beautiful diaper work. The modern east wall is built over the old screen wall, which at this point crossed the church



THE BUILDER, APRIL 2, 1898





THE TOWN HALL (THE LATE MR. CUTBERT BRODERICK)



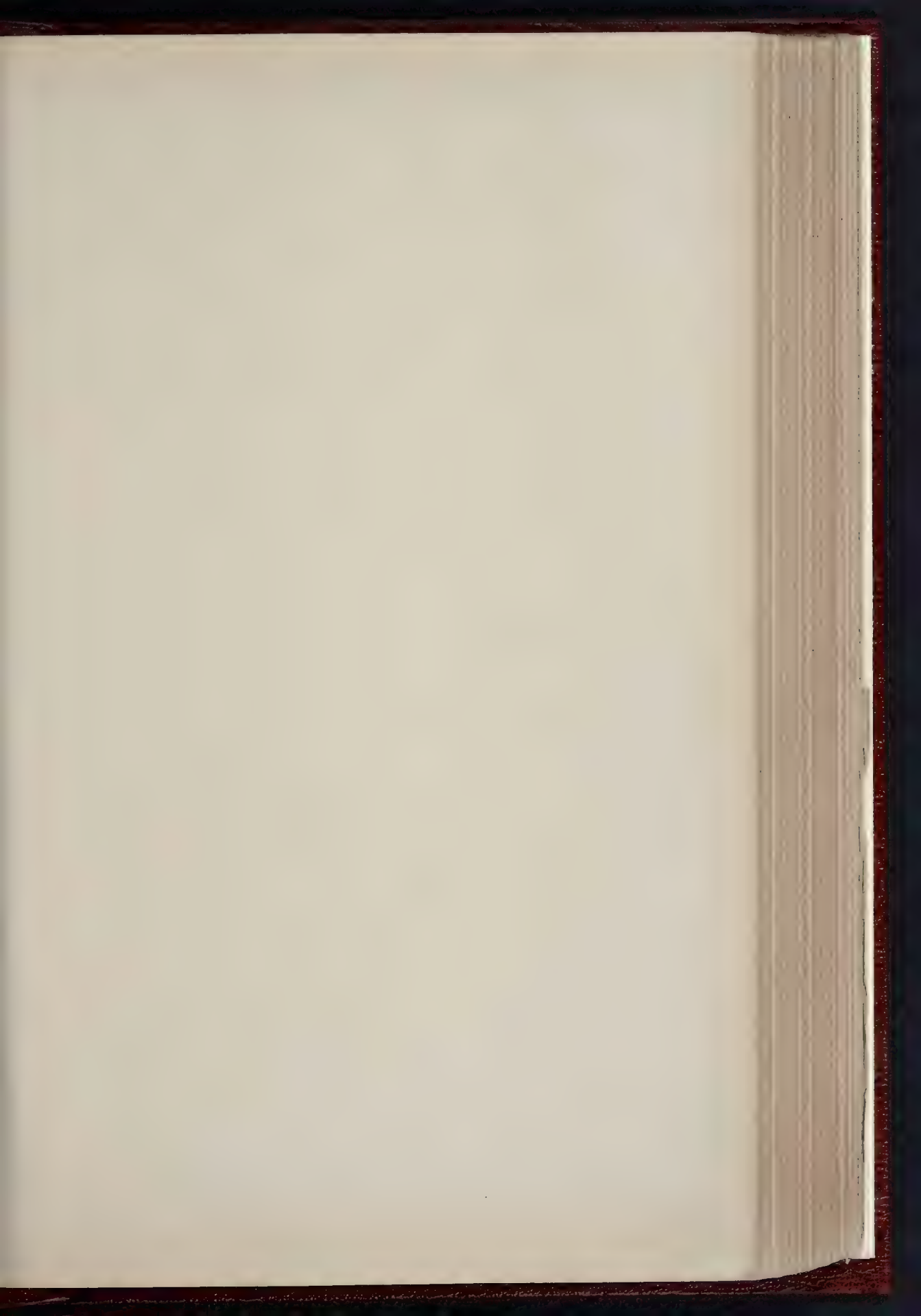
GREAT THORNTON STREET CHAPEL (THE LATE MR. LOLLWOOD)



ST. MARY'S CHURCH (THE TOWER BY SIR GILBERT SCOTT).

NEW PHOTOGRAPH BY A. C. & S. EAST ARDEN, 10, FLEET STREET, E.C. 4, LONDON.

HULL ARCHITECTURE

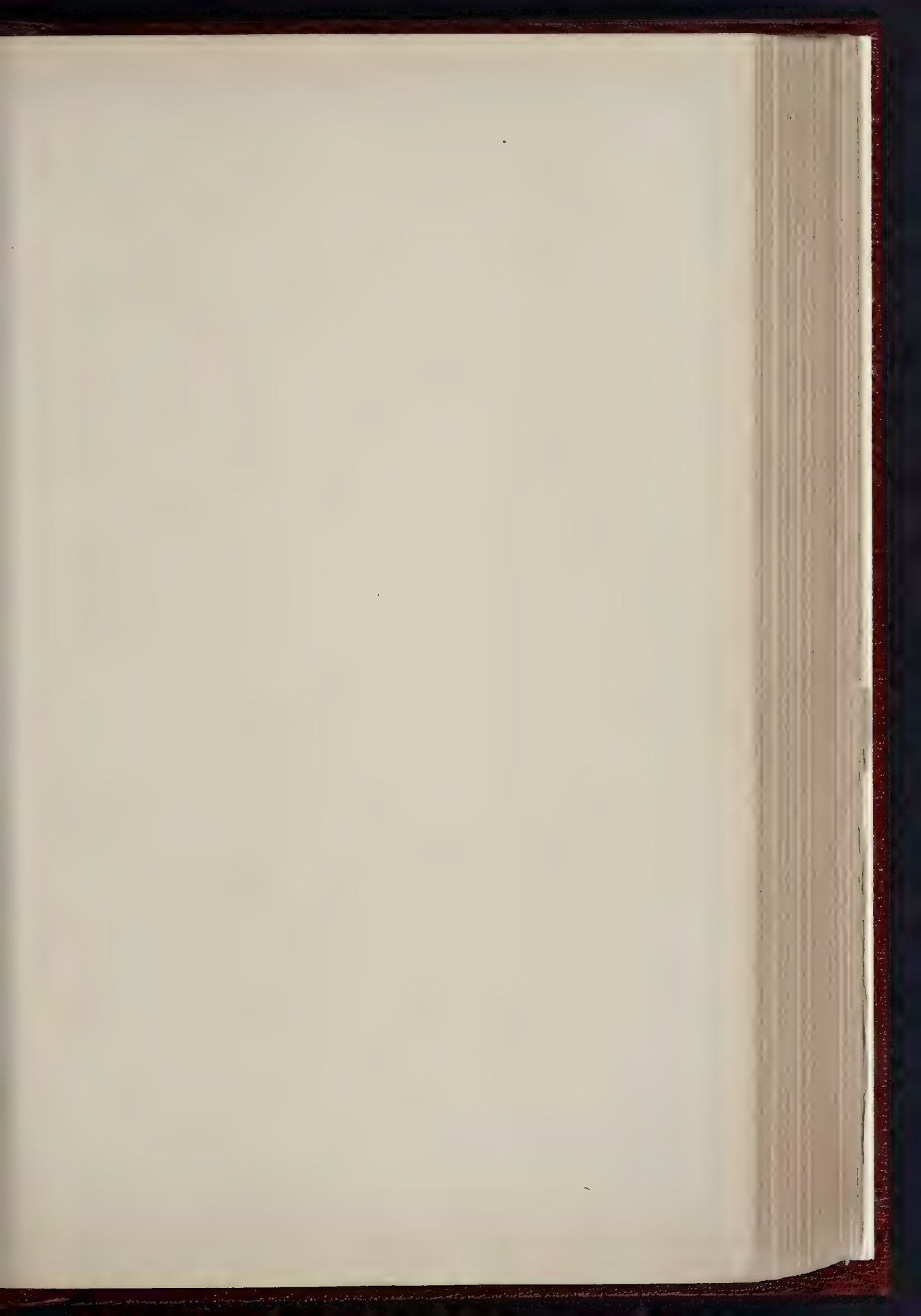


THE BUILDER. APRIL 2, 1898





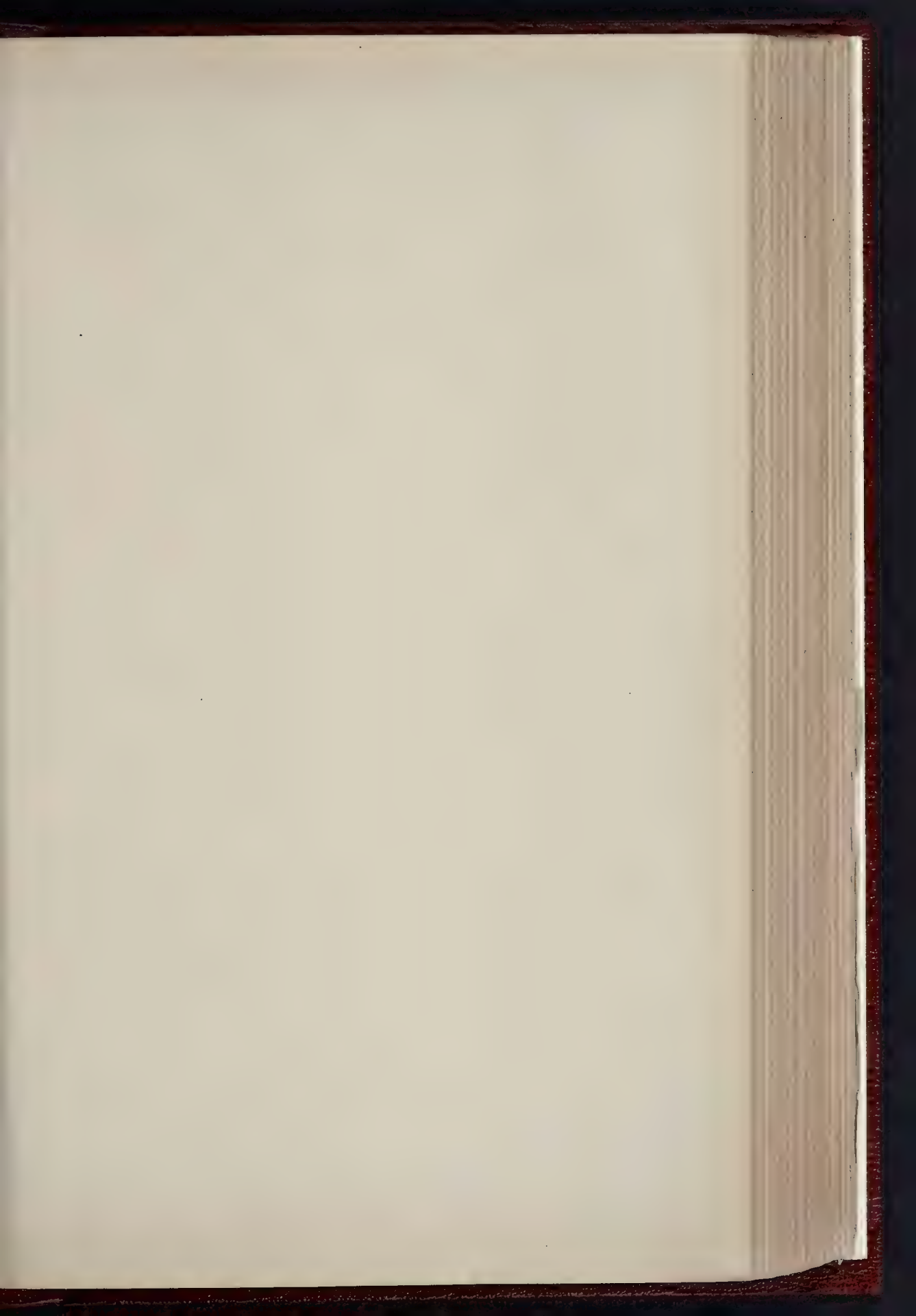
HULL ARCHITECTURE. THE "PUNCH" HOTEL (MESSRS. SMITH, BRODRICK & LOWTHER)







THE PHOTOGRAPH BY A. J. & S. EAST HAD N. STREET - E. LANE E.



THE BUILDER, APRIL 2, 1893.



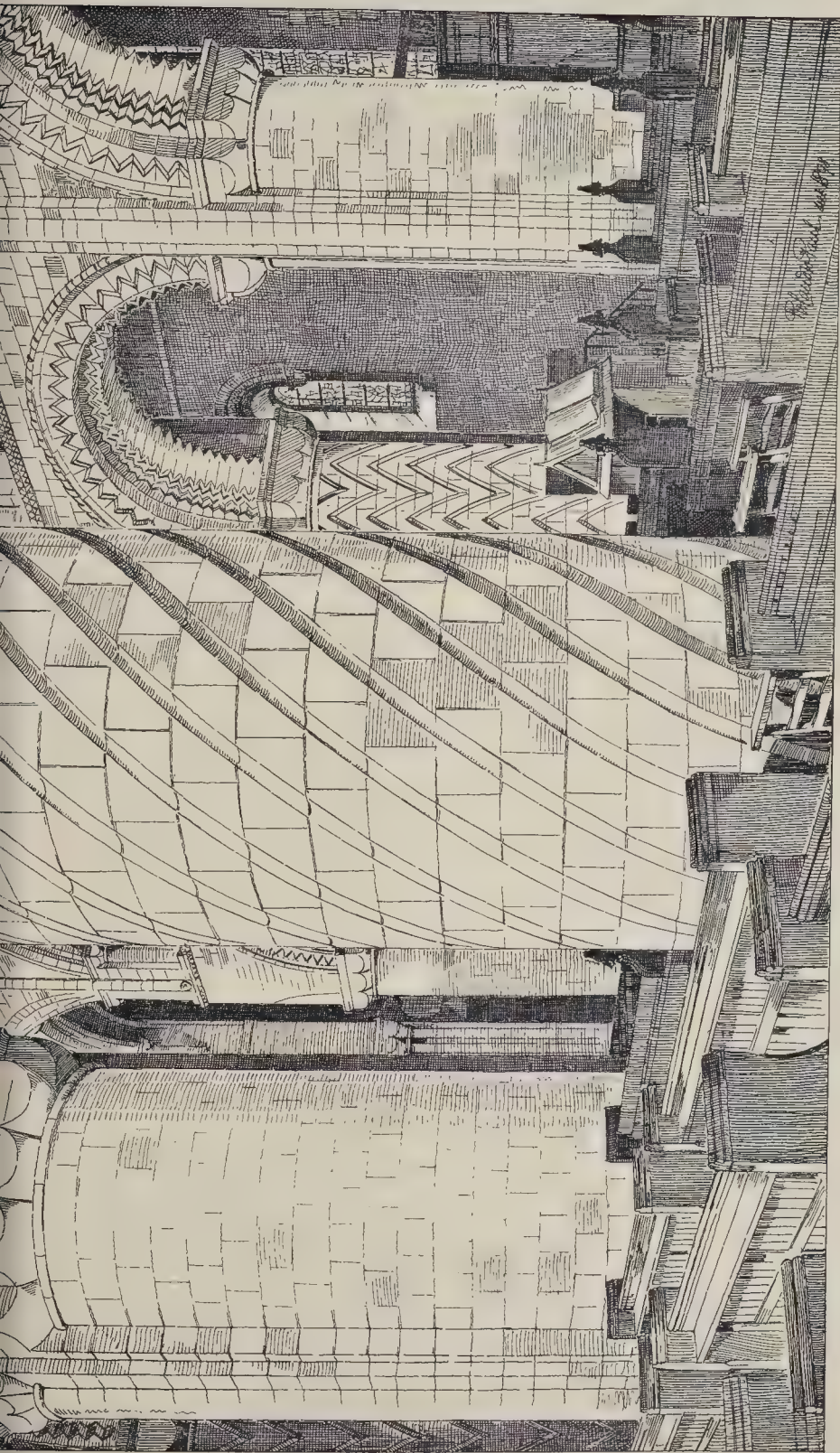
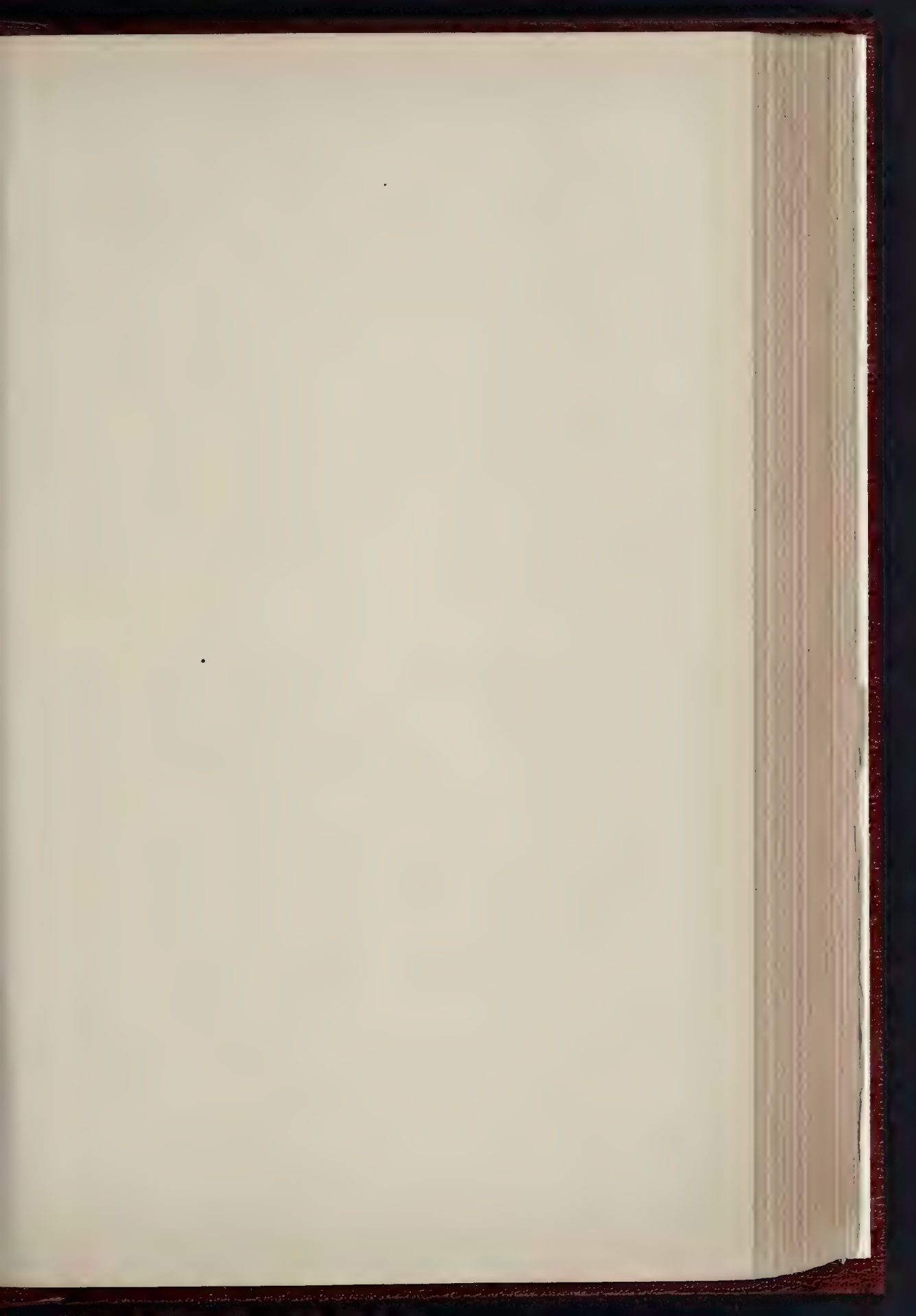
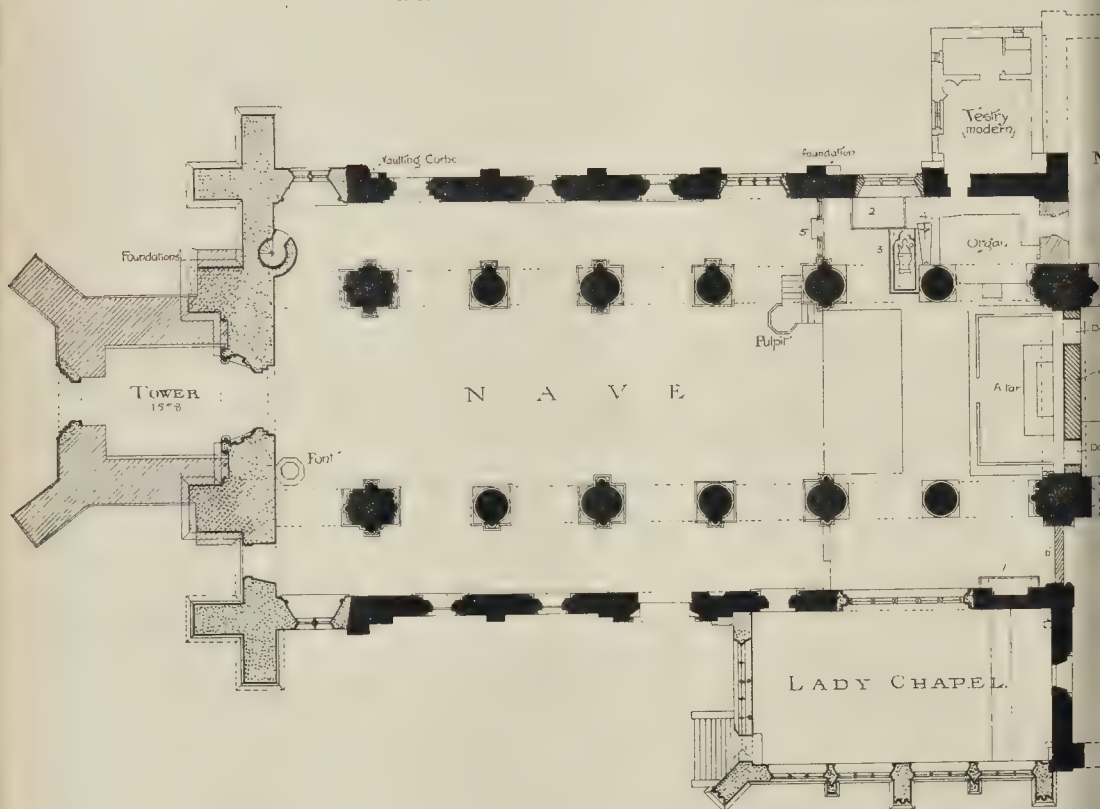
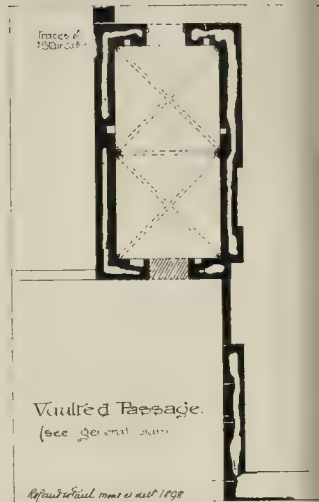
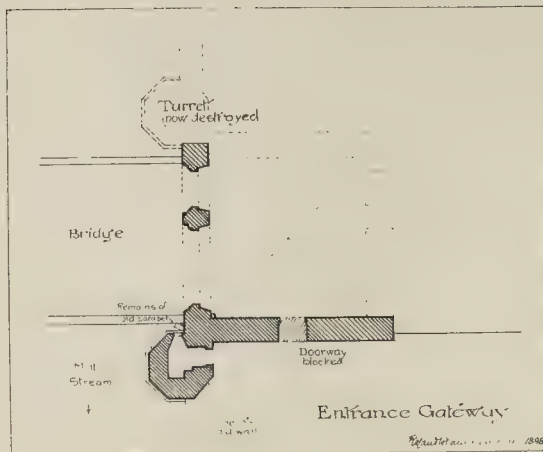


PHOTO 110 SPRING A.C. IN 1885 EAST HANING STREET ESTER. AND E.C.

THE ABBEYS OF GREAT BRITAIN. No. 25. WALTHAM.

DRAWN BY MR. ROLAND W. PAUL.







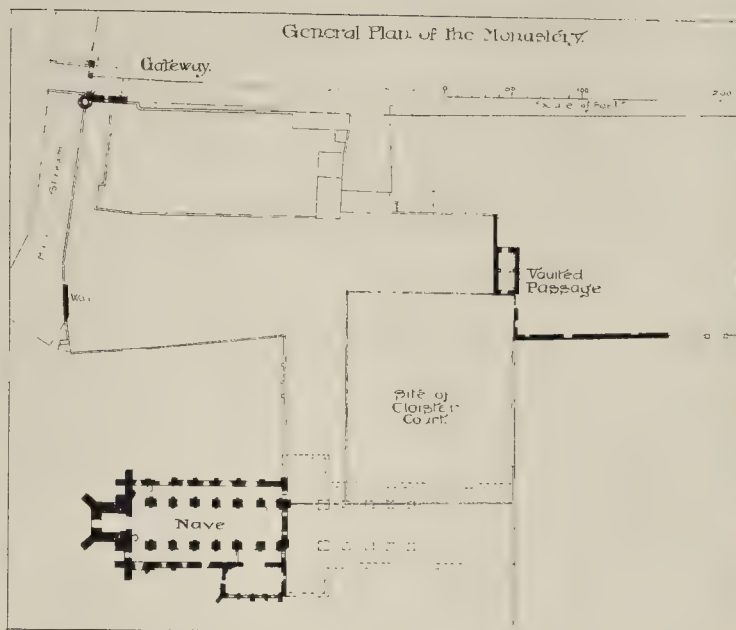
Arms of the Abbey.

Monuments, etc.

1. Denby Monument 1599
2. Smith Monument 1697
3. Maffix of brass
4. Tomb with Cross
5. "Decorated" Screen
6. Remains of Herodas (built in)

Dates

	Norman		Perpendicular
	Transitional		Later
	Decorated		Modern



nsepl

Foundations

Site of Presbytery

nsepl

Foundations

10 5 10 20 30 40 50 Feet

Scale
for Plans

Nave from plan by M^r A B Plummer
 Foundations of Presbytery from plan
 by M^r E. Butler. General plan based
 on Ordnance Survey.

With additions *Howard Maitland, 1898.*

WALTHAM ABBEY

Ground Plan.



dividing the monastic from the parochial church, and on the east side are still to be seen the doorways which flanked the altar. The chief monuments are shown on the plan; a cross slab and a matrix of an abbot's brass in the north aisle, a tomb with effigies to Sir Edward Denny and his wife, 1599, at the east end of the south aisle; and a monument to Robert Smith, 1607, in the north aisle. The font, which formerly had arched sides, has been reworked, and is of no interest. All the fittings are modern. There are some interesting traces of a large fresco on the east wall of the Lady Chapel, two brackets, and the remains of the transept buttresses. The ground plan we give has, as regards the existing church, been based on a plan by Mr. A. B. Plummer with the monuments added, and also the foundations lately discovered at the west end. The lines of the presbytery, the foundations discovered, and the transepts have been based on a plan by Mr. Edmund Leiler, given by him in Vol. II. of the Essex Archaeological Transactions; and a general plan of the site of the monastery is given reduced from the Ordnance Survey, with the porch and approach to Lady Chapel, since taken away, omitted. The plans of the gateway and vaulted passage are to the same scale as that of the church, and have been measured specially to complete the illustrations of what now remains of the buildings. The total length of the church would have been less than 300 ft. The nave is 106 ft. in length, the central tower was 35 ft. square, and the length of the presbytery, assuming that the present wall stands on the old eastern wall, was 133 ft., giving a total length of 274 ft.

The arms of the Abbey, shown on the plan, were *Arg.* on a cross engrailed *Sa.* five crosses, crosslet, fitchée *or.* Another appears on a seal *Ag.* two angels volant *or.* supporting a cross Calvary *arg.*

North of the entrance gateway to the monastery are the fishponds, in good preservation, and near them the remains of a fourteenth-century stone bridge with ribs, locally known as "Harold's Bridge," and said to have originally led to the stables.

In the *Builder*, October 18, 1879, will be found a series of measured drawings by Mr. A. B. Plummer, including a longitudinal section, showing the north side of the church, an elevation of the south side, and various details of mouldings, windows, and other features in the church. Those wishing a more complete knowledge of this interesting monastery, and the arguments that have been advanced in support of theories for and against the nave being a part of Harold's church, should refer to the late Professor Freeman's paper in the *Transactions of the Essex Archaeological Society*, Vol. II., where is also a paper by Mr. Edmund Litterton on "The Church and Monastery," and also Mr. J. A. Reeve's paper in Vol. II. of the "Proceedings of the St. Paul's Ecclesiological Society" (1890). "A Guide to the Abbey," with much information, has been compiled by

Mr. W. Winters, which is still to be obtained in the town.*

HULL ARCHITECTURE.

The three lithograph plates under this general title form a portion of the illustrations to the article on the architecture of Hull, published in the present issue, and are all noticed and commented on in the course of that article.

THE ARCHITECTURAL ASSOCIATION: CONSTRUCTIONAL STEELWORK.

An ordinary fortnightly meeting of this Association was held in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, on Friday last week, the President, Mr. Hampden W. Pratt, occupying the chair.

The minutes of the last meeting having been read and confirmed, Messrs. C. C. King and S. J. B. Stanton were elected members of the Association.

On the motion of Mr. C. B. Carvill, junior honorary secretary, a vote of thanks was accorded to Mr. T. Dinwiddie for allowing the members to visit the New Cross Baths. The visit to-day (Saturday) to the baths in course of erection at Pitfield-street, Shoreditch, and to the Free Library adjoining, was also announced.

The Chairman called attention to a demonstration on stained glass by Mr. Christopher Whall, on Monday, the 4th instant, at 7 o'clock, at the Central School of Arts and Crafts, Regent-street. Admission by ticket, to be obtained from the Hon. Secretaries of the Association.

Mr. Howley Sim, senior hon. secretary, announced that the members' Soirée and smoking concert would be held on April 29, at the Café Monico, Piccadilly Circus, to which members would be admitted free by ticket, and members' friends on payment of 2s. 6d.

The Chairman said that the *Conversazione* this year was not so much a *conversazione* as it usually had been, and very little opportunity for social intercourse was given on that occasion; but the Soirée, a varied programme for which was in course of preparation, would present a good opportunity for meeting friends.

Mr. Thos. C. Cunningham then read a paper on "Constructional Steelwork," part of which we print this week, as follows:—

"Until recent years the subject under consideration was generally considered to be within the sphere of the 'civil engineer' only, but with the various developments both in character and in extent of recent buildings and requirements, it has to be seriously considered by the architect. In buildings of the 'warehouse' or 'factory' class, the construction is comparatively simple. The complication, both

as regards loads and construction, arises where the several parts of the same building are occupied by several different classes of tenants and devoted to different uses. In dealing with a subject of this class, many points have to receive consideration independently of safety of the building, and utility of the various sections for their requirements. Where the interior of various rooms is decorated, the construction has to be confined within the limits of the proposed treatment and internal architecture. In city buildings, where space and light are of the most paramount importance, every thought and care has to be taken with the view to limiting the columns, stanchions, girders, and floors to the minimum sections consistent with their carrying power.

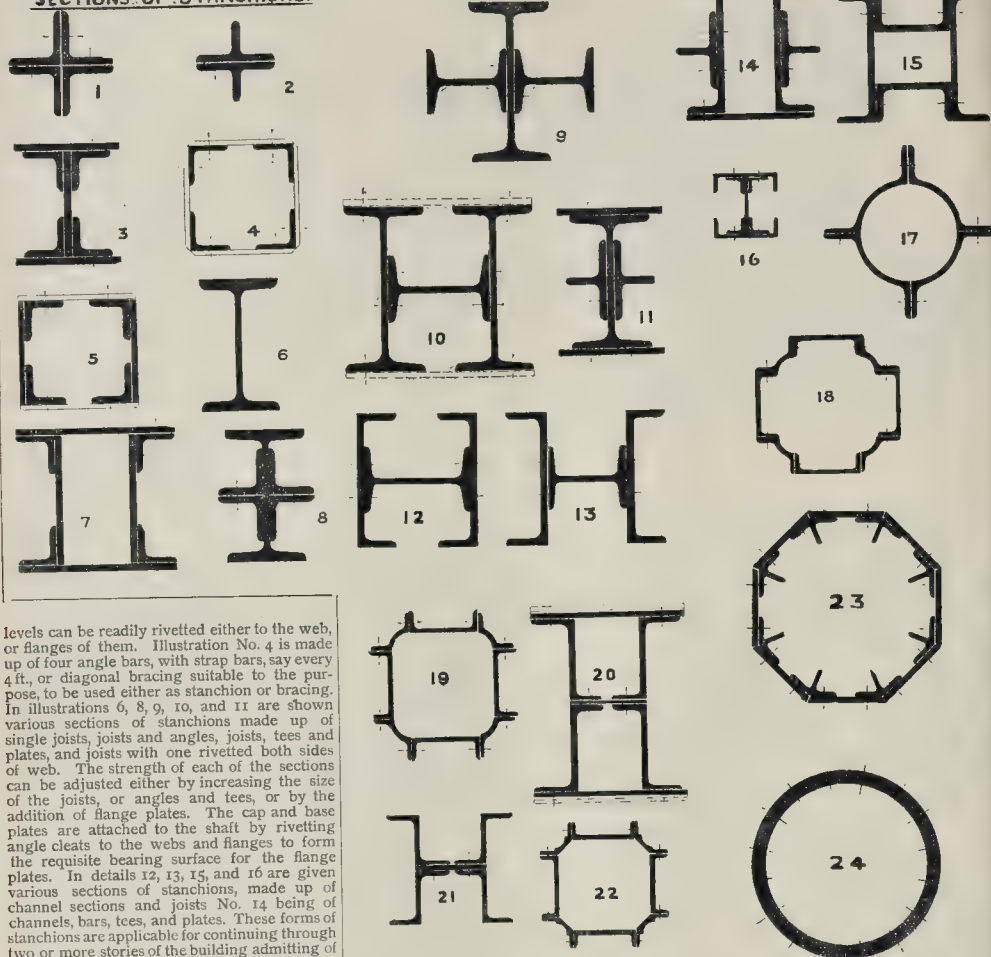
In the first place we will consider interior columns and stanchions with their several connexions and joints, as upon them depends principally the stability of the superstructure. Interior columns and stanchions form one of the most important steps in the modern problem of design, and greater variations are probably to be found in them than in any other features of steel construction. Each of the several forms has its own adherents, and the many types of connexions between the columns and stanchions, and with the floor systems, permit of an unlimited choice. We will endeavour to investigate the more prominent forms, and point out the advantages and disadvantages of each. The most satisfactory for general and specific cases may then be selected as combining the desired features. The relative advantages of the various sections are of the greatest importance, as affecting economical and successful design. In actual practice the treatment of the different shapes will be found to vary greatly with the designer, not only in the relative value of the sections, but in the treatment of any one section. In the first place the formulae differ greatly, not in fundamental principles perhaps, but in the treatment being often empirical, and containing factors deduced from some special case. These formulae, also, generally assume ideal loading, which seldom occurs in the actual building, and none, or very few full-sized tests, have ever been made on the effects of eccentric loading. The general principles which govern the resistance of built columns may be summed up as follows:—

1. The material should be disposed as far as possible from the neutral axis of the cross-section, thereby increasing 'R' (radius of gyration).
2. There should be no initial internal stress.
3. The individual portions of the column or stanchion should be mutually supporting, and
4. The individual portions of the column or stanchion should be so firmly secured to each other that no relative motion can take place, or they will fail as a whole.

From experiments, the closed column and stanchion is stronger than any open one, due to the fact that the edges of the segments are mutually supporting when held in contact by complete closure. Therefore the circular-built column is undoubtedly the most favourable form for compression, because the capacity of columns of equal areas varies as the metal is removed from the neutral axis. It must also be remembered that any form of column or stanchion, having a maximum and minimum radius of gyration, is not economical for use under a single concentric load, as the calculations must be based on the minimum radius of gyration. The metal represented by the excess of the maximum radius of gyration is, of necessity, disregarded, and part of the section is thus lost or wasted when we consider the ideal efficiency of the column; but practice does not always support theory, and many other questions besides mere form arise in connexion with the judicious choice of a section. The form of stanchions and columns most generally in use is given upon the sheets. You will observe that No. 1 section is made of four angles, rivetted back to back; No. 2, of two T-bars, also rivetted back to back. The caps and bases of these are easily formed by either forging one of the flanges of each bar at right-angles to the stem, or rivetting forged angle-seatings to the stem to receive cap and base plates. In illustrations 3, 5, and 7, the stanchions are made up of angle-bars and plates rivetted together as indicated. The strength and size can be either increased or decreased as circumstances require. The caps, bases, and flange plates of these forms are attached by angle cleats rivetted to the plates, angles, and webs. Bearings for joints or girders at intermediate

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of "Waltham Abbey." For the list of Abbeys which have already appeared, and for particulars of future arrangements, see page xvi.

SECTIONS OF STANCHIONS.



levels can be readily rivetted either to the web, or flanges of them. Illustration No. 4 is made up of four angle bars, with strap bars, say every 4 ft., or diagonal bracing suitable to the purpose, to be used either as stanchion or bracing. In illustrations 6, 8, 9, 10, and 11 are shown various sections of stanchions made up of single joists, joists and angles, joists, tees and plates, and joists with one rivetted both sides of web. The strength of each of the sections can be adjusted either by increasing the size of the joists, or angles and tees, or by the addition of flange plates. The cap and base plates are attached to the shaft by rivetting angle cleats to the webs and flanges to form the requisite bearing surface for the flange plates. In details 12, 13, 15, and 16 are given various sections of stanchions, made up of channel sections and joists No. 14 being of channels, bars, tees, and plates. These forms of stanchions are applicable for continuing through two or more stories of the building admitting of two or four girder joists bearing at the same level, particularly so the sections Nos. 13 and 15. Sections Nos. 17, 18, and 19 are made up of flanged quadrant bars, flanged quadrant bars and channels, the diameter of 18 and 19 can be increased and decreased as occasion requires by using smaller or larger sections of channels. Sections 18 and 19, whilst retaining the minimum diameter, can be very considerably increased in strength by adding plain or bulb-shaped tees, plain bulb-shaped angles, or by the addition of plates, either inside or outside of the channel bars. Section No. 22 is made up of channels and Lindsay's special angles, or plain angles. This particular section was very successfully used in the West Australian Bank, Cornhill. In this particular instance they were 21 ft. 6 in. long, 11 in. diameter, made of four 5 in. by 3 in. channel bars and four 3 in. by 3 in. by $\frac{1}{2}$ in. angle bars. In order to suit them to the respective loads, the strength of part of them was increased by an additional 1 in. plate rivetted to the back of the channel on the inside. Two of these stanchions, one the light and the other the heavy section, were tested at Messrs. Kirkaldy's works, and admirably withstood the compressive strain to which they were subjected. Upon the light section 158 tons were applied, and upon the heavy section 237 tons were applied, each of them, together with the caps and bases, being made in the usual manner; that is, without any special preparation for testing. With reference to section No. 18, there is a difficulty in rivetting up these stanchions if of small diameter. The forms of stanchions shown in sections Nos. 20 and 21 readily adapt themselves to purposes of construction of high buildings,

where several floors have to be considered, and supported by the same stanchion. The section can easily be made to suit any number of loads and floors, by either increasing or decreasing the diameter, or increasing or decreasing the sectional area. These sections have found particular favour with the American architects and engineers in the construction of their high buildings from the fact of their easy adaptability to their specific requirements, to their form and construction, and from the fact that they can be readily encased with fire-resisting materials independently of being made up of bars that are either kept in stock at the mills or can be generally quickly supplied.

The drawn steel columns as illustrated on Wm. Lindsay & Co.'s sheet are made from 4 in. up to 24 in. diameter and from $\frac{1}{2}$ in. to 1 1/2 in. metal in one piece, excepting the flanges forming caps and bases. They are made in lengths not exceeding 21 or 22 ft., and are generally used in lengths not exceeding in height one high or two short stories; when they are superimposed the single joist girders bear upon the flanges, and are attached. When columns of larger diameter are required and girders either of double joist compound girders or rivetted plate girders are used, the columns are made to seat on the girders, the girders abutting and being continuous, the flanges of the caps and bases being bolted to the girders. Ornamental caps and bases, either in cast iron or other metal, can be readily adapted to these drawn steel columns,

to suit the several styles of architecture. The great advantage of these columns is that you get the greatest amount of carrying power for the minimum diameter and thickness of metal, and this point deserves consideration when space is an object, or where shipment has to be considered. One of these columns was tested at Messrs. Kirkaldy's with most excellent results, the length being 14 ft. 7 in. diameter, and 1-in. metal, the calculated safe load being 92 tons. It was tested up to 180 tons, practically without any movement, and no injury was observable to the material under microscopical examination. Columns shown in details Nos. 23 and 24 are built up of steel plates and T bars, an curved steel plates for large diameter columns heavy constructions; or, where they are exposed their form admits of being increased almost to any diameter and strength. The cap and base flange plates are attached by angles rivetted to shaft, and the flange plates rivetted to the angles. In special cases an additional plate is put on, the outside extending from 12 in. to 14 in. from the ends before putting the flanges on for purposes of additional strength. The steel stanchions shown on Wm. Lindsay & Co.'s sheets combine the principle of the ordinary angle-bar stanchion and the column: the bars are rolled in such a manner as to form a hollow shaft, and the metal is placed at as great a distance from the central axis as possible. They are made in the form shown, of four bars, or, for addition of strength or diameter, plates or bulb bars are

inserted between the flanges of the angles. The cap and base flanges are attached to forged bent plates, or angles riveted to shaft. These stanchions have been extensively used, as, independently of their strength, comparatively with their diameter and sectional area, they can be easily encased in fire-resisting material, either rectangular or circular shape, to suit the architecture of the building. Taking one 14 ft. long, 8 in. diameter, the safe load is 85 tons, and generally, in practice, the full load has been placed upon them, and proved satisfactory. To increase the size of the bases and the bearing surface area of the various steel columns and stanchions referred to, to provide for heavy or extreme loads, they rest upon cast-iron bases, formed to suit each special requirement. The cast bases may either rest upon joist foundations, hereafter referred to, or upon adequate stone bases and concrete foundations, the columns and stanchion bases being bolted down to the cast-iron bases.

The Fireproofing of 'Columns' and 'Stanchions.'

As columns and stanchions carry the greatest concentrated loads found in modern buildings, the proper fireproofing of these becomes a most important subject for consideration; unfortunately, in only too many cases is this slighted or omitted, even to a very dangerous extent, as has been proved in numbers of instances. Many systems have been introduced, and both the 'hard tile,' the 'porous tile,' 'terra cotta,' and concrete have been used extensively. The requirements in the adequate fireproofing of columns and stanchions are:—

1. The material must be indestructible by fire.
2. The material must not be heat-conducting.
3. The material must be so secured to the columns or stanchions that it cannot be dislodged. The use of hard fire-clay tiles is only to be recommended when such tiles are hollow, with a sufficient and proper air-space around the metal column or stanchion, and even then experience seems to show that the hard tile is in no way so satisfactory under great heat as the porous kinds. The application of cold water in combination with heat has also proved the hard tile far less reliable in case of conflagration than the porous tile, as the hard tile is very apt to crack off under such conditions. The use of solid blocks of porous tile well bedded against the metal column or stanchion or solid pumice concrete seems to be highly satisfactory. The requirements for fireproofing the interior columns and stanchions by the Chicago ordinance are defined as follows:—

(1) 'The coverings for columns or stanchions shall be, if in brick, 8 in. thick; if of hollow tile, one covering at least 2½ in. thick.

If the fireproofing is made of porous terra-cotta it shall be at least 2 in. thick, whether hollow tile or porous terra-cotta is used; the courses shall be so anchored and bonded together as to form an independent and stable structure.'

(2) 'In all cases there shall be on the outside of the tiles a covering of plaster with Portland cement, or of other solid cement of equal hardness and efficiency when set.'

(3) 'If plastering on metallic laths be used as fireproofing, it shall be in two layers, of which the first shall be applied in such a manner that the concrete or plaster will cover the entire external face of the column or stanchion, while the space between the two layers shall not be less than 1 in.

The metallic laths shall in each case be fastened to the metallic firings and the plastering upon same shall be made with cement.'

Foundations for Columns and Stanchions.

In designing the foundations for columns and stanchions for a building, where they rest upon a yielding stratum, proper provision must be made for the uniform distribution of the weight. In cases where the loads vary the foundations should be proportioned according to the different loads, so that the bearing per unit of ground area will be equal and a uniform settlement of the structure assured. Where the loads are excessive an excellent foundation for columns and stanchions can be formed with rolled steel joists, either in a single bed or more; the foundation for them being prepared by a suitable bed of Portland cement concrete of ordinary depth, then placing the joists thereon.

Where the unusual loads are to be supported

the joists may be crossed in two or more directions, each at right angles, their distances apart from centre to centre varying from 9 in. to 24 in., according to circumstances—i.e., length of their projection beyond the masonry thickness of concrete, estimated pressure per square foot, &c. They, however, should be placed at least far enough apart to permit the introduction of concrete filling between the joists. The most useful application of this system of foundation is on sites where a thin and comparatively compact stratum overlies another of a more yielding nature. By using joists in such cases, the requisite spread at the base may be obtained without penetrating the firm upper stratum or carrying the footing courses down to an unusual depth. In covering the joists with concrete, 6 in. should be left at the ends and sides of them and 1½ in. to 2 in. on top. A convenient way of doing this is to make a plank frame of the same size as the concrete bed, and at the proper height and perfectly level; after this is filled it is made for the next courses, and so on; the whole exterior being rendered with Portland cement so that no metal is exposed.

The method of calculation for joists used in foundations may be stated thus:—

The arms or projections of the two lower courses are fixed by the lengths of the upper ones, and by the dimensions of the sub-soil area; hence the question is how many joists are required.

Let y = projecting arm of any course.

a = width of supporting area.

l = total load on footing.

M = bending moment on one side of layer.

Then the length of joist $= a + y + y = a + 2y$.

Load on $y = \frac{ly}{a+2y}$ and since the distribution of the load on every layer is uniform, we have

$$M = \frac{ly}{a+2y} \times \text{lever arm } \frac{y}{2} = \frac{ly^2}{2(a+2y)}$$

In calculating the lower course, y becomes a known quantity and M an unknown.

The usual spacing where three tiers are used is

15 in. for lower tier.

12 in. for middle tier.

9 in. for top tier.

For any other spacing of pressure than given, M can be found from the formula

$$M = P \sqrt{\frac{s b}{12}}$$

When P = the projections in feet for the several tiers of beams.

b = the allowable bearing capacity per square foot of ground in tons.

s = spacing in inches.

The method in regard to the calculation of such footings is still an unsettled question, as some engineers claim that the action of the concrete filling, with its tendency to bind the iron and concrete together, causes the foundation to act as a whole, and thus possess a moment of resistance much greater than the sum of resistance of the individual layers. But in view of the uncertainty of such assumption the method of calculating all moments about the edge of the casting would seem more logical as well as being on the safe side. Two illustrations are exhibited of this class of footings. The smaller one, 15 ft. 6½ in. square base, is a copy of a footing used in the 'Marquette Building,' Chicago, for a load of 410 tons, the base of cast iron is 3 ft. 6 in. by 4 ft. resting upon five 20 in. joists 100 lbs. per foot each and 14 ft. ½ in. long. These 5 in. joists rest upon fourteen 15 in. joists 41 lbs. per foot each. The other, with base 15 ft. 6½ in. by 19 ft. supporting two stanchions, is taken from the same building, the load on one stanchion is 181 tons 8 cwt. and the other 250 tons 16 cwt. Under the cast bases, which are 3 ft. 6 in. square, are five 15-in. joists, each 80 lbs. per foot, and five 20-in. joists, 80 lbs. per foot, under the cast bases, supporting the light and heavy loads respectively. Underneath these, at right angles, are fourteen 12-in. joists, 17 ft. 6 in. long, resting upon the concrete foundation.

In determining the sizes of the joists in any layer, care must be taken to leave sufficient clearance between the flanges to admit the concrete, which must be rammed in place. Hitherto this class of foundation has been but little used in this country, although it has been used in several isolated cases. In Messrs. Jones & Higgins's warehouse, Peckham, it was

very successfully used. A modification of the systems lends itself readily as foundation for columns, stanchions, and piers for buildings, or corner sites, or where the site of the building is of such a nature as necessitates the system being used. It has been used in the construction of the new premises in the Strand, at the corner of Adam-street. In this instance the joists are framed 3 in. or 4 in. wide, and rest upon the solid concrete foundation, substituting the usual piers and footings for the front walls."

[Owing to the great pressure of other matter, we are compelled to hold over the remainder of Mr. Cunningham's paper, together with a report of the discussion which followed, until next week.]

THE INSTITUTE OF BUILDERS (INCORPORATED).

THE fourteenth annual general meeting of this Institute was held at the offices, 31, Bedford-street, Strand, W.C., on the 28th ultimo, Mr. William Shepherd in the chair.

The Secretary, Mr. R. S. Henshaw, having read the audited accounts for the past year, they were received and adopted.

The following report, having been read, was unanimously adopted:—

"In presenting their fourteenth annual report, the Council have to record, with great regret, the death of Mr. W. J. Mitchell, of Dulwich, and Mr. R. S. Parker, of London. The Council had correspondence with the London Chamber of Commerce in reference to an inquiry the latter body were prosecuting in reference to an alleged custom of secret trade commissions, and were invited to tender evidence; but, after due consideration, they came to the conclusion that they could not usefully assist in the objects of the inquiry, which were by no means free from obscurity, and the meaning of the term was also indefinite, and the London Chamber of Commerce was so informed. The Workmen's Compensation Act occupied the attention of the Council, and every effort was made by the sub-committee appointed to deal with the subject to obtain such modifications of the measure as were considered consistent with the interests of the trade, but unfortunately with very little effect. Some modifications of the most objectionable provisions, which were in the original proposals, were effected and were satisfactory so far, but the measure remains inequitable on an important point, in that it relieves the workman from any sense of individual responsibility by sweeping away the penalty which should naturally be the consequence of the individual's neglect or inattention to his own personal safety. It is unnecessary to refer in detail to the work of the Committee, which is fully recorded in the minutes. . . The Council have been in correspondence with the London County Council upon the form of contract adopted by that body, and some modifications of the objectionable provisions have been obtained, but the provisions on the whole are still such as to leave it an inequitable contract, and one that contractors should not accept. There appears to be some friction in regard to contracts generally, owing, in a great measure, to the Royal Institute of British Architects being unable to conclude an agreement upon conditions of contract with the Council of the Institute, and there is no doubt it is desirable, and to the interests of all parties, that the two bodies should by mutual concessions make some effort to get rid of the points of difference, and be able to put forward a set of conditions which are agreed. At present there are many very objectionable forms of contract in use by architects, more objectionable in some instances than that of the Royal Institute of British Architects, and there is a difficulty in getting rid of these, which would be simplified if there was a form which could be put forward on the authority of the Royal Institute of British Architects and of the Institute of Builders. The arrangement that was concluded with the Office of Works as to the nomination by the Council of Surveyors in the preparation of the quantities for works under the Department, estimated to cost over 20,000l., has been acted upon in two instances during the year, and the Council has appointed in the cases of a post-office at Swansea and additions to the Parcel Department, Mount Pleasant. The only other matter to which it is necessary to refer is the legislation proposed by the London County Council for amending the London Building Act of 1894, but your Council are not in a position to say if it will be necessary to take action in regard to it, but apparently the interests of the trade do not appear to be directly affected. . . In accordance with the articles of association, the President, Mr. Wm. Shepherd, one of the Vice-Presidents, Mr. Joseph Randall, the treasurer, Mr. George Plucknett, one of the auditors, Mr. Ernest S. Rider, and four members of the Council, Messrs. George Burt, Henry Gough, S. Wheeler, and George Williams retire, but are eligible for re-election; and one other vacancy on the Council remains to be

filled by the election of some member at the general meeting."

Mr. Henry Holloway was then elected President for the ensuing year, Mr. Joseph Randall and Mr. W. F. King were re-elected and elected Vice-Presidents respectively, Mr. George Burt was re-elected a member of the Council, and Messrs. H. W. Horner, John Greenwood (London), J. Stevenson Jones (Liverpool), and Henry Wells (Aldershot) were elected members of the Council. Mr. George Plucknett was re-elected treasurer of the Institute; and Mr. E. S. Rider was re-elected auditor.

A cordial vote of thanks to Mr. W. Shepherd for his services as President during the past year terminated the proceedings.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. T. McKinnon Wood, Chairman, presiding.

Loans.—Upon the recommendation of the Finance Committee it was agreed to lend the Fulham Vestry 2,500*l.* for wood-paving works; the Greenwich District Board 930*l.* for street improvements; the Hammersmith Vestry 9,820*l.* for erecting a coroner's court and mortuary, &c.; the Lambeth Vestry 1,400*l.* for paving works; the St. Martin's Vestry 1,705*l.* for drainage works; the Wandsworth District Board 3,000*l.* for street improvements; the Camberwell Guardians 770*l.* for building works; the St. George's (Hanover-square) Union 4,500*l.* for the purchase of premises as a site for a laundry; and the managers of the Central London Sick Asylum District 20,000*l.* for the erection of an asylum.

Boadicea Statue.—The General Purposes Committee recommended the Council to approve as a suitable site for the Boadicea statue group the extreme end of the Victoria Embankment wall by the corner of Westminster Bridge, and that the Highways Committee be authorised to make arrangements for placing the group in position.

Sir Arthur Arnold moved as an amendment, and Mr. Corbett seconded, "That the consideration of the report be postponed for three weeks, and that in the meantime letters be addressed to the President of the Royal Academy, the Royal Institute of British Architects, and the First Commissioner of Public Works, asking them whether they have any alternative site to suggest for the erection of this statue."

The amendment was rejected.

Mr. Bruce moved another amendment—"That the recommendation be referred back in order that the opinion of the President of the Royal Academy may be taken on the subject." It was clear that among sculptors there was a strong opinion that the group, if erected on the proposed site, would be very severely criticised by foreign artists who came to London. He asked the Council to hesitate in fixing the site until they had had the best artistic opinion on the subject.

Mr. Campbell, in seconding the amendment, hoped the new Council would not inaugurate its work by making itself ridiculous in the eyes of the public. He protested against this proposal to give the very best site in the world to this second-rate piece of art. The proper place for this group was in the middle of one of the public parks, but where it was suggested it would add to the vulgarisation of Westminster Bridge.

Mr. J. Burns, M.P., supported the recommendation, and, in doing so, stated that when the opinion of the Royal Academy had been taken in the selection of sites, the result had been anything but satisfactory. A striking instance of this was the Shaftesbury fountain in Piccadilly-circus, which was a beautiful statue, but the site was an inappropriate one, and the chances were, if the Academy were called in to select a site for the Boadicea group, they would make a similar mistake. Public opinion was agreed that the statue was a beautiful one, and surely it was worthy of a good site.

Mr. Beachcroft read a letter from Sir W. Richmond, in which he spoke very highly of the statue.

Mr. Bull thought it rather late to find fault with the statue. The matter had been before them for two years, and they were now ready to bring the statue on to the site. A great many people had written to him approving of the site. In bronze the statue looked twice or

three times as well as the plaster cast now on the site.

On a division the amendment was rejected by 78 to 36 votes, and the recommendation of the Committee was then agreed to.

Electric Light Installation, Crossness Outfall.—On the recommendation of the Main Drainage Committee, it was agreed—(a) That the estimate of 5,500*l.* submitted by the Finance Committee be approved, and that the Council do agree to the installation of electric light at the Crossness outfall in accordance with the drawings presented to the Main Drainage Committee, at an estimated cost of 7,000*l.* (b) That tenders be invited for the supply and fixing complete of the dynamos, engines, switchboard, and principal mains, and also for the supply and fixing of the service mains, wiring, and fittings.

Central Store and Bakehouse, Boundary-street Scheme.—On the recommendation of the Housing of the Working Classes Committee, it was agreed that the estimate of 1,125*l.* submitted by the Finance Committee in respect of the erection of a central workshop and bakehouse on the Boundary-street area be approved; that the work of erecting the central workshop and bakehouse be carried out by the Council without the intervention of a contractor, and that the plans, specification, quantities, and estimate of 1,016*l.* be referred to the Manager of Works for that purpose.

The Westminster Improvement.—On the report of the Improvements Committee with regard to the Embankment Extension Scheme, it was moved by Mr. H. P. Harris, Deputy Chairman of the Council, seconded by Mr. Hayter, and agreed to without discussion, "That it be referred to the Improvements Committee to construct and bring up at the earliest date practicable a scheme for the embankment of the Thames from the Victoria Tower Garden to Lambeth Bridge, including the widening of Millbank-street, and the utilisation of any surplus land which remains after the carrying out of the improvement."

The Works Department.—The Main Drainage Committee reported as follows:—

"On February 22 we informed the Council that Mr. Thomas Adams, whose tender, amounting to 2,145*l.* 11*s.* 3*d.*, had previously been accepted for constructing a new sewer along Hamilton-road, Norwood, declined to undertake the work, and we recommended the acceptance of the next lowest tender, viz., that of Messrs. John Mowlem & Co., amounting to 2,504*l.* 5*s.* 6*d.* The Council, however, directed that we should report whether the work should not be carried out without the intervention of a contractor, and empowered us in the meantime to proceed in the matter. Having been informed that the Manager of Works estimated the cost of constructing the sewer at 2,460*l.*, and that he was still prepared to undertake the work at that sum, we thought that we should be carrying out the wishes of the Council by entrusting the job to the Works Department, as the amount of the Manager's estimate is less than that of the tender recommended for acceptance. We have accordingly referred the plans, specification, and bill of quantities, together with the estimate of 2,460*l.*, to the Manager of Works with a view to the work being put in hand without further delay."

Colonel Rotton, on the reception of the report, protested against placing the work in the hands of the Works Department. It was understood that this description of work should be done by contract. This kind of thing would prevent people from contracting, and if no contractors came forward the ratepayers would be at the mercy of the Works Department, which could charge what it pleased.

Mr. Ward said that this matter came up before the last Council. Originally five contractors tendered, but the two lowest afterwards withdrew. Then the Committee advised the acceptance of the third lowest, that of Messrs. Mowlem & Co., but the Council referred it back to see if the Works Department would undertake the work at less cost. Now the case was somewhat altered, as no contractor was willing to undertake the work except at a large advance on the Engineer's estimate.

The report was then accepted.

Houses let in Lodgings.—The Public Health Committee reported as follows:—

"On October 19 last we submitted to the Council the remarks of the Vestry of Clerkenwell on a report by Dr. Young with regard to the sanitary condition and administration of the parish. One of the matters referred to was the desirableness of requiring in the by-laws as to houses let in lodgings, a minimum cubic space of 400 ft. per adult person in rooms occupied by day and by night, instead of

350 ft., which is the amount specified in the Vestry's by-laws, and we expressed the hope that the matter would be further considered by the Vestry when any amendment of the by-laws was under consideration. We are now glad to report that the Vestry have decided to alter their by-laws so as to increase the air space to 400 cubic feet, and thus to make them in this respect uniform with the by-laws of the other London sanitary authorities."

Waterloo Bridge: Electric Lighting.—The Bridges Committee recommended, and it was agreed, that the design submitted for the lamps to be erected on Waterloo Bridge be approved; that the Bridges Committee be authorised to obtain tenders for the supply of the same, and that the sanction of the Council be given to an expenditure of 300*l.* to be incurred in connexion with supplying and fixing the lamps.

New Offices and County Hall.—The Establishment Committee recommended that the Council should, in consequence of inadequate office accommodation, take on lease No. 55, Charing Cross, at 600*l.* a year rent.

Sir Arthur Arnold pointed out that the Council were spending 15,000*l.* a year for office accommodation, and this matter was of grave and prime importance.

Mr. Beachcroft asked the new Deputy-Chairman (Mr. H. P. Harris) whether he had made a tour of inspection of the offices used by the 400 officials of the Council, and whether he had noticed the insanitary and cramped condition of the rooms where electric or gas light was required throughout the day.

Sir Harry Poland complained that on occasions when he came to Spring-gardens to consult others on important business he had been unable to find a room vacant, and even the passages were often used by members for want of accommodation. It was a great scandal that those in their employment had not proper accommodation, and were relegated to underground places with artificial light in the day time.

Mr. Torrance pointed out that there was a report in existence, and he would ask the Deputy-Chairman to bring it again before the Council.

The Deputy Chairman, in reply, said that he had made a tour of inspection, and he must admit that, but for the guidance of some of the officials, he could not have found his way about. He could only say that the Establishment Committee would take the matter into its serious consideration.

Fire Inquests.—Colonel Ford moved that it be referred to the General Purposes Committee to consider and report as to the desirableness of the provisions of the City of London Fire Inquests Act, 1888 (51 and 52 Vic., cap. 38), being extended to the whole of the County of London.

Mr. Beachcroft seconded the motion, pointing out that the late inquiry into the City fire had been of the greatest assistance.

The motion was agreed to.

Lambeth Palace Grounds.—Colonel Ford moved that the Parks Committee should report as to the expediency of the Council applying to Parliament for power to acquire the grounds of Lambeth Palace as a public open space.

Mr. Dickinson objected to the motion as it stood, and moved, as an amendment, that it be referred to the Committee to consider the advisability and possibility of obtaining the ground as an open space.

Mr. Hayter seconded the amendment, which Colonel Ford accepted, and the motion was then adopted.

The Closing of Cemeteries.—Mr. Shaw Lefevre moved:—"That a Special Committee be appointed to inquire into the condition of the cemeteries and burial grounds within the Metropolitan area, and to report whether any further provision for such purpose is necessary, and also whether it is expedient that any regulation should be laid down in respect of such places in the interest of public health and decency."

Sir Arthur Arnold seconded the motion.

Mr. Leon moved, and Mr. Organ seconded, as an amendment, that the matter be referred to the Public Health Committee.

The amendment was carried, and adopted as a substantive motion.

The Crystal Palace.—Colonel Campbell moved:—"That it be referred to the Technical Education Board to consider the suitability of the Crystal Palace as a centre for technical instruction, and to ascertain the terms on which the use of certain parts of the building and grounds could be acquired for such a purpose."

Mr. Dickinson seconded the motion, concurring that the ultimate destination of the Crystal Palace would become more pressing year by year.
After discussion, the motion was carried by 42 votes.
The Council adjourned at seven o'clock.

BUILDING TRADES ASSOCIATION OF MANCHESTER, SALFORD, AND DISTRICT.

The annual general meeting of the general delegates federated in this Association was held at the Union Hotel, Piccadilly, on Monday evening the 28th ult., Mr. George Macfarlane, Vice-President, the absence of Councillor W. Holland, J.P., President, occupying the chair. After reading the annual report, which was adopted, the President, Vice-President, Treasurer, and Council were unanimously elected.

The Chairman, in his address, stated that the local arrangements had been made and officers elected in connexion with a federation of building trade employers for Lancashire and Cheshire. This combination of building trade employers embraced along with Manchester and Liverpool twenty-four of the largest towns in Lancashire and also some of the towns in Cheshire. The purpose of the federation was to unite all the local associations connected with the building trade throughout Lancashire and Cheshire, and promote and form builders' associations in towns and districts where they did not already exist. This plan of federating local associations with a county federation was part of a national scheme whereby all England and Wales were first apportioned or divided into county districts, and then into national association centres. A map had been prepared showing fourteen county divisions—these again are combined into five national centres—the National Association of Master Builders of Great Britain being the head, uniting all and giving guidance and assistance wherever required. Thus every town and every group of villages would have a Master Builders' Association dealing with matters immediately connected with their own locality. The county division would deal with wider and more important issues, while the National Centre would concentrate the power of all the constituent Associations; the National Association being, as it were, the head and that held the reins and through whom all were represented. By this scheme a truly National Association would be formed that would have strength and weight to deal with any matters affecting the building trades. The late engineers' strike had been an object lesson both to the workmen and masters. Its result would no doubt have a steady effect upon trades-unions throughout the country, and might be the means of producing a less combative state of mind and a desire to use diplomacy in settling trade matters. They had difficulties before them in two of the building trades. The carpenters and joiners had given notice for alterations to their working rules, which, if adopted, would seriously affect employers. It was hoped, however, that no conflict would result, and that some mutual concessions would overcome the present difference. The stone-masons had also sent in a notice for their 1d. per hour, and rather drastic alterations to their working rules. Of course, workmen and employers looked at the conditions of labour each from their own point of view; and from an employer's point of view he considered, if such stringent working rules as the masons now wished to enforce were adopted by all the other trades in the country, England would in a few years become a third rate power, and such a thing as "Free Trade" would be unknown. It was a mistaken self-interest in workmen to make such demands. Economic laws could not be overruled with impunity, and it was to be hoped that the masons would let wise counsels prevail, and be content to take a good deal less than they asked for. The limitation of apprentices question was a very serious one, producing a marked scarcity of workmen in the trades affected. All those unfair obstructions, when carried to their logical conclusion, meant a great deal of harm to the country at large, and more especially to the families of the working classes. The Employers' Liability Act that would come into operation on July 1 next would impose a serious burden upon employers in the building trade, and unless the insurance companies were able to give reasonable terms of insurance, small masters would not be able to bear the charges which the law would demand. In many branches of the building trade the difference in social position between employer and employed was not far removed, and often enough the employed in the building trade, at all events, they were burdened with less responsibility, and this new law had imposed an additional responsibility that would carry very hard upon a class of hard-working and industrious men.

Mr. Walter Marshall, stone-mason, in addressing the meeting, read the proposed new rules of the Manchester masons, commencing very strongly upon the unreasonableness of them, and the impossibility of carrying out work either successfully or profitably under the restrictions that the men were trying to impose.

Mr. W. Higson, jun., plasterer and painter, spoke of the great scarcity of plasterers, and the great difficulty on that account of getting work carried on properly; this scarcity being brought about entirely through the limitation of the number of apprentices allowed. They were only allowed three apprentices to each firm, however large a number of men the firm employed, the master plasterers being worse off in the matter of apprentices than any other section of the building trade.

Mr. Henry Matthews, builder, spoke of the advantages likely to be gained by employers from the federation of employers just formed for Lancashire and Cheshire. The Lancashire Federation had been the pioneer of the other federations that were now being formed all over England, and Mr. Tomlinson, who had been appointed the secretary of the Lancashire and Cheshire Federation, had done good work in getting the master builders in the various towns of Lancashire together and forming associations where none already existed.

Mr. Frank Williams, plumber, Mr. Amos Mason, plasterer, and Mr. J. Daniels, builder, also spoke upon the importance of getting the various members of each trade to join their several associations. The necessity of having a Builders' Institute, or Building Trade Exchange, was raised by some of the members, and the secretary, Mr. Fred Scott, was asked to communicate with those who, in other towns, had already formed such Institutions, for information as to their constitution and working.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Battersea.—A one-story shop in front of No. 94, Eversleigh-road (Mr. H. B. Measures for the Artisans, Labourers', and General Dwellings Company, Limited).—Consent.

Hackney, South.—Buildings on the south side of Lea Bridge-road, eastward of Thistlewaite-road (Messrs. F. Chambers & Son for Messrs. Longbourne, Stevens, & Powell).—Consent.

Lewisham.—One-story additions to the "Chandos Arms" public-house, Brockley-rise, at the corner of Cordington Hill (Mr. R. A. Lewcock for Mr. G. Burrell).—Consent.

Limchouse.—Two open iron galleries at the third floor level, in front of warehouses at Middleton's Wharf, High-street, Wapping (Mr. H. Lafone for Butler's Wharf, Limited).—Consent.

Chelsea.—Inclosed porches, bay windows, and angle turrets to two blocks of residential flats on the north-east side of Franklin's-row, between Turk's-row and the grounds of the Duke of York's School (Mr. P. Hoffmann for Mr. H. Bailey).—Consent.

Chelsea.—Projecting bay windows and porches at Nos. 2 and 4, Lower Sloane-street (Mr. W. H. Willett).—Consent.

Fulham.—A porch to each of three blocks of residential flats in course of erection on the west side of Rostrevor-road, between Swift-street and Filmer-road (Mr. J. A. Bowden for Messrs. Evans & Read).—Consent.

Fulham.—An addition to Fulham Town Hall on the site of Nos. 1, 3, 5, 7, and 9, Harwood-road (Vestry of Fulham).—Consent.

Hammersmith.—A glass and iron shelter in front of Hammersmith Town Hall, Brook Green-road (Mr. J. H. Richardson for the Vestry of Hammersmith).—Consent.

Hampstead.—Two bay windows and an open wooden porch in front of a house next Beechroyd, on the north side of Finchley-road (Messrs. Davis & Emanuel for Mr. E. J. Cave).—Consent.

Holborn.—A porch in front of a proposed new building on the site of Nos. 17, 18, and 19, Queen-square, Bloomsbury (Messrs. Marshall & Vickers for the Alexandra Hospital for Children with Hip Disease).—Consent.

Islington, East.—A one-story shop upon part of the forecourt of No. 214, Seven Sisters-road (Mr. C. Catling).—Consent.

Lambeth, North.—One-story shops in front of Nos. 133, 135, 137, 139, 141, and 143, Waterloo-road (Mr. F. H. Hulse for Dr. E. Croker).—Consent.

Newington, West.—That the application of Mr. J. Warne, for Mr. J. H. Billingham, for an extension of the period within which the erection of seventeen houses on the south side of Hillingdon-street, between No. 133 and Royal-road, Walworth, was required to be completed, be granted.—Agreed.

St. George, Hanover-square.—A portico to a block of residential flats on the north side of Brook-street, at the corner of South Molton-lane (Messrs. Holloway Bros.).—Consent.

Wandsworth.—That the Council do approve of the variation shown on the plans submitted with the further application of Mr. H. Branch for the Wandsworth Library Commissioners from the plans sanctioned on December 20, 1897, for the erection of a one-story library building on the north side of All-farthing-lane, at the corner of Melody-road.—Agreed.

Westminster.—An open portico in front of a block of residential flats on the north-east side of Curriale-place, Victoria-street (Mr. G. Baines for Mr. G. Martin).—Consent.

Westminster.—One-story shops on the forecourts of Nos. 96, 98A, 98B, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, and 122, Victoria-street (Mr. C. Fruen).—Consent.

Strand.—That Mr. J. Dunn be informed that the application of Mr. W. Horrex for consent to a glass and iron covered way erected in front of Horrex's Hotel, Norfolk-street, having been further considered, the Council sees no reason to vary its decision of November 30 last.—Agreed.

Kensington, South.—A glass and iron covered way erected at the principal entrance to the De Vere Hotel, Hyde Park Gate (Mr. W. Graves for Mr. J. Crowle).—Refused.

Belgrave Green, North-east.—Erection of a glass and iron illuminated fascia in front of the shops at Nos. 48 and 50, Green-street (Mr. J. G. Needham for Mr. A. Gobetz).—Refused.

Dulwich.—Six houses with projecting bay windows on the north side of Crawthorne-grove, with the flank of the westernmost house to abut upon Worlingham-road, Camberwell (Mr. A. E. Mullins for Mr. L. Nolley).—Refused.

Clapham.—One-story addition and the raising of the present addition at the rear of No. 88, Bolingbroke-grove, abutting upon Wakehurst-road, Battersea (Mr. H. Branch for Dr. T. Clarke).—Refused.

Fulham.—A building with a one-story projecting bay window and porch at No. 109, New King's-road (Mr. J. B. Rosevear).—Refused.

Hampstead.—Houses, with shops, on the north-east side of High-road, Kilburn, to abut also upon the west side of Kilburn Priory (Mr. A. O. Collard for Captain J. Fitzroy Bagot, M.P., and Mr. A. Chudleigh).—Refused.

Kensington, South.—A block of buildings with projecting bay windows, &c., at Hyde Park Gate, on the south side of Kensington-road, to abut also upon Palace Gate (Mr. B. Hosegood).—Refused.

Lewisham.—The erection of houses, with shops, upon the site of Nos. 141 and 143, Rushey Green (Mr. A. L. Guy for Mrs. Atkins).—Refused.

Marylebone, East.—The erection of an electricity generating station on the north-east side of Grove-road, St. John's Wood, to abut also upon North Bank (Mr. C. S. Peach for the Central Electric Supply Company, Limited).—Refused.

Marylebone, West.—The erection of a porch on the south side of the "Crown" public-house, Nos. 23 and 24, Aberdeen-place, St. John's Wood (Mr. C. H. Worley for Mr. F. Crocker).—Refused.

Marylebone, West.—An open porch in front of Bendall House, Great James-street (Mr. A. J. Bolton for Sir T. Baker, Bart.).—Refused.

Paddington, South.—The erection of a glass and iron conservatory upon the one-story hall and portico at No. 5, Connaught-place, Bayswater (Mr. E. S. Prior for Mr. J. M. Scott).—Refused.

Rotherhithe.—A theatre on the west side of Lower-road, to abut also upon Culling-road (Mr. G. R. Sprague for Messrs. Marler & Saunders).—Refused.

St. George, Hanover-square.—Enclosure of the sides and front of the portico at No. 47, Brook-street (Messrs. G. Trollope & Sons for Lady Delamere).—Refused.

St. George, Hanover-square.—The erection of a glass and iron pent at the entrance to No. 32, Brook-street, to abut upon South Molton-street (Mr. T. J. Gawthorpe for Messrs. Thomas & Son).—Refused.

St. George, Hanover-square.—Wood and glass inclosures of two verandahs erected at No. 28, Park-lane, and overhanging the public way in that street and Upper-street respectively (Messrs. S. J. Waring & Sons for Mr. S. J. Waring).—Refused.

St. George, Hanover-square.—The erection of a glass and iron pent at the Dover-street entrance to the Avondale Hotel, No. 68A, Piccadilly (Messrs. Douglas Young & Co. for the Avondale Hotel Company).—Refused.

Wandsworth.—A one-story shop on part of the forecourt of No. 135, Eardley-road, Streatham (Mr. T. G. Stanley).—Refused.

Westminster.—Buildings on the northern side of James-street, and also on the southern side of Caxton-street, to abut upon Brewers-green (the Vestry of St. Margaret and St. John, Westminster).—Refused.

Width of Way.

Camberwell, North.—A building over the gateway entrance to No. 176, Neate-street (Mr. A. Garnar for Mr. E. G. Quinn).—Consent.

Hackney, South.—A boundary wall on land adjoining the Great Eastern Railway, on the east side of Warburton-street (Mr. S. A. Bevan for Gas Light and Coke Company).—Consent.

Southwark, West.—Additions to the Board School, Marlborough-street, New-cut (Mr. T. J. Bailey for the School Board for London).—Consent.

Woolwich.—The forecourt walls of four houses on the north-east side of Elm-grove, Plumstead, at less than the prescribed distance from the centre of the road (Mr. T. Hastings).—Consent.

Norwood.—The erection of five blocks of two-

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

story stables on a site at the rear of the houses on the north side of Harpenden-street, Norwood-road, Tulse Hill, at less than the prescribed distance from the centre of a passage-way leading out of Harpenden-street (Mr. H. G. Brace for Mr. W. Moss).—Refused.

Whitechapel.—A house, with shop, on the north side of Pelham-street, Mile End New Town, with the flank wall at less than the prescribed distance from the centre of Hunt-street (Messrs. Davis Brothers).—Refused.

Space at Rear.

Southwark, West.—Three blocks of stabling, with bacon, &c., stores over, on the site of Nos. 85 to 105 (odd numbers only), Gravel-lane, and premises at the rear at the corner of Orange-street, without an open space at the rear of such blocks (Mr. E. Carritt for Mr. J. Sainsbury).—Refused.

Irregular Open Space at Rear of Buildings.

Whitechapel.—That the Council do in the exercise of its powers under Section 41 of the London Building Act, 1894, allow a modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of three four-story houses, with shops, on the site of Nos. 80, 82, 84, and 86, Hanbury-street, Spitalfields, with irregular open spaces at the rear (Messrs. Rouch & Parkhouse for Mr. H. Parkhouse).—Agreed.

Deviation from Approved Plans.

Finsbury, Central.—That the application of Mr. R. W. Hobden on behalf of Mr. S. Parrish, for permission to deviate from the plans sanctioned on November 2, 1897, for the rebuilding of the "Sutton Arms" public-house, No. 16, Great Sutton-street, by an alteration in the position of the staircase leading from the first floor to the private rooms on the upper floors of the premises and a reduction in the size of the internal area on the west side of the public-house be not granted.—Agreed.

Line of Fronts and Width of Way.

Fulham.—Porches, with balconies over, to four two-story houses on the north-west side of Colehill-lane, between Kimbell-gardens and Frith-road (Mr. H. Mann).—Consent.

Kensington.—A block of residential flats, with bay windows, on the site of Nos. 79, 81, 83, 85, and 87, Drayton-gardens (Mr. A. Blackford for Mr. J. H. Duncan).—Consent.

Kensington, South.—Iron and stone balconettes, and of a glass and iron pent roof, to a block of residential chambers on the site of No. 59, Drayton-gardens (Mr. J. Norton for Mr. T. Boyce).—Consent.

Battersea.—That no order be made with respect to the application of Mr. J. G. Buckle for Mr. T. Jones, for the consent of the Council to the erection of a one-story building at the rear of No. 100, Lavender Hill, to abut upon Tipton-road.—Agreed.

Brixton.—That Mr. H. A. Scott be informed that the application of Mr. F. Harmer for the consent of the Council to the erection of a one-story addition upon the forecourt of a workshop next No. 1, Station-road, having been further considered, the Council sees no reason to depart from its previous decision not to grant the application.—Agreed.

Hammersmith.—Rebuilding of the White Hart public-house, Nos. 357 and 359, King-street West, to abut upon White Hart-court (Messrs. Wilson & Long).—Refused.

Kensington, South.—A one-story shop on part of the forecourt of Jasper House, Earl's Court-road, (Messrs. Morley & Letts, for Mr. J. Buckle).—Refused.

Peckham.—That Mr. E. J. Stevens be informed that his application on behalf of Mr. T. Wade, for the consent of the Council to the erection of one-story shops in front of Nos. 571 and 573, Old Kent-road, Camberwell, having been further considered, the Council has resolved to adhere to the decision of February 28 last with reference to the application.—Agreed.

Line of Fronts and Space at Rear.

Wandsworth.—That the Council, in the exercise of its powers under Sections 22 and 41 of the London Building Act, 1894, do not consent to or permit the erection of a two-story building on the north side of the Balham Hotel, No. 21, Chestnut-grove, Balham, at the corner of Boundaries-road (Mr. H. F. Williams for Mr. G. R. Huntley).—Agreed.

Thickness of Walls, &c.

Stepney.—That the Council, in the exercise of its powers under the London Building Act, 1894, do not approve of a variation from the plans and particulars sanctioned on October 26, 1897, for the rebuilding of a foreman's dwelling-house in the copage on the south side of Raven-row, to abut also upon Russell-street, Whitechapel-road (Mr. R. Spence for Messrs. Mann, Crossman & Paulin).—Agreed.

Line of Fronts and Construction of Buildings.

Clapham.—That Mr. C. D. Collins be informed that his application for the consent of the Council to the construction and erection of a wood and glass show-case at No. 78, Northcote-road, to flank

upon Bennerley-road, Battersea, having been further considered, the Council sees no reason to depart from its previous decision not to grant the application.—Agreed.

Formation of Streets.

Woolwich.—The formation or laying out of a new street, for carriage traffic, between Maurice-street and Green-lane, New Eltham (Mr. G. F. Logsdail for Mr. A. Stubbs). That the name Blannerle-road be approved for the new street.—Consent.

Lewisham.—The formation or laying out of two new streets, for carriage traffic, to lead out of Brockley-lane and Brockley-road, respectively (Mr. J. W. Webb). That the names Crofton Park-road and Stillness-road be approved for the new streets.—Consent.

Wandsworth.—The formation or laying out of three new streets, for carriage traffic, to lead out of Mitcham-road, and the formation of a street in continuation of a new street known as Totterdown (Mr. W. C. Poole for Mr. A. Heaver). That the names Undine-street, Valney-street, Ensham-street, and Totterdown-street, be approved for the new street.—Consent.

Rotherhithe.—The formation or laying out, for foot traffic only, of a paved street, 20 ft. wide, at the rear of New Church-street, Bermondsey, in continuation of Llewellyn-grove (Mr. H. H. Bridgman).—Refused.

Wandsworth.—Houses, with shops, on the north side of Vant-road, and the widening of part of Mitcham-road (Mr. W. C. Poole for Mr. G. Heaver).—Refused.

Whitechapel.—The formation or laying out of a paved street, 30 ft. wide, between Brady-street and a carriageway on the north side of Brady-street dwellings, on a site adjoining Salomon's almshouses and the disused Jews' burial ground next the Great Eastern Railway, one of the entrances to such new street being 40 ft. wide (Mr. H. H. Collins for Messrs. N. & R. Davis).—Refused.

Cubical Extent.

Woolwich.—That subject to the provisions of Section 76 of the London Building Act, 1894, the consent of the Council be given to the erection, on a site approached from roads out of Footscray-road, New Eltham, of a building to exceed in extent 250,000 but not 450,000 cubic feet, and to be used only for the purposes of the trade of a lithographic printer (Messrs. F. Chambers & Son for Messrs. Gilbert, Whitehead, & Co.).—Agreed.

Extension above Diagonal Line.

Chelsea.—A modification of so much of the provisions of Part V. of the London Building Act, 1894, with regard to the extension above the diagonal line as directed to be drawn by Section 41 of that Act, so far as relates to the height of a portion of the rear of a block of residential flats, six stories high, proposed to be erected on the site of Nos. 12 and 13 and of part of Nos. 11 and 14, D'Oyley-street (Messrs. Bouchier & Galsworthy for Messrs. W. Holt & Sons).—Refused.

Buildings for the Supply of Electricity.

Hammersmith.—An addition to the Hammersmith electric lighting station, Palace-road, Fulham (the Vestry of Hammersmith).—Consent.

Conversion of Buildings.

Kensington, South.—Alterations to Jasper House, No. 1, Wetherby-terrace, Earl's Court-road, and the conversion of that building into a shop (Messrs. J. W. Morley & Letts for Mr. J. Buckle).—Refused.

Recommendations marked † are contrary to the view of the Local Authority.

Correspondence.

To the Editor of THE BUILDER.

DESIGN FOR A SMALL COUNTRY CHURCH.

SIR,—Whatever merits this design, illustrated last week, may possess, there are two practical objections to the erection of such a structure. Firstly, there would be the usual danger from fire common to all wooden buildings, or buildings in which wood predominates; and, secondly, there would, after a few years, be a continual expense for repairing decayed woodwork and for painting. Surely a simple Early English design is most suitable for a small country church.—Yours, &c.,

PRACTICAL.

*. The drawing was a competition one for the Grissell Medal given by the Institute of Architects, and we understand that the condition was that it was to be mainly a timber building, in order to exhibit construction in wood. We do not see such strong objection, however, to a timber church for a country district. The danger of fire in a church is much less than in most other classes of building.—En.

METHODS OF LAYING SLATES.

SIR,—I notice in your issue of the 26th ult. your illustration of what is called "A new method of laying slates." This, so far as France is concerned, is not by any means new. I send you herewith a set of Messrs. G. Laviere & Company's illustrated booklet numbered 1, 2, 3, 4, 5, and 6. In No. 3, on page 6, you will see the same thing illustrated, only the slates are held in position by iron bolts on an iron roof. Of course, the principle is exactly the same, that shown by you. There is also a somewhat similar method of roofing shown in album 4, page 28. In the latter case ordinary slates are laid on the skew, but there is no lap shown, nor is any necessary when the slates are laid in this way. It is obvious, however, that the skew-laid roof must be more liable to let the wet in than the roof shown on page 6 of album 3.

C. H. BROODBANK.

*. The first example referred to in Messrs. Laviere's catalogue is not exactly the same in detail as the Dublin Slating Company's, as the top angle of the slate is left uncut; it is, as our correspondent says, the same in principle.—Ed.

BOOKS RECEIVED.

AMERICAN INSTITUTE OF ARCHITECTS.—Proceedings of the thirty-first annual Convention (Published by the Board of Directors of the Institute).

LAW AND PRACTICE RELATING TO WORKMEN'S COMPENSATION AND EMPLOYERS' LIABILITY.—By W. Ellis Hill (Waterlow & Sons).

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XIV.

BRANCH of our subject which has been recently introduced into the Intermediate Examination is the reciprocal diagram of forces. To understand this it is necessary that the student should first be familiar with the triangle, parallelogram, and polygon of forces. We shall therefore invite the student's attention to so much of the study of statics as relates to these theorems.

The first axiom which must be comprehended is that forces may be represented in magnitude and direction by straight lines. Since lines may be drawn from any point, it is clear that they may be so drawn as to represent the points of application of forces; and, since they may be drawn in any direction, they may likewise be made to represent the direction of forces. As also lines may be drawn of any length, they may be made of such length as to represent on any desired scale in relation to each other the same ratio that forces do; that is, they may, by their length, represent the magnitude of the forces.

When two forces act on a point in the same direction their combined effort is equal to their sum, for their sum may be represented by a straight line, the length of which is made up of two straight lines, whose lengths respectively represent the two forces. Similarly, when two forces act on a point in opposite directions, their combined effort will be the difference of the two forces in the direction of the greater.

When single forces act upon the point, produce the same effect as two or more forces acting upon the same point, the first force is called the resultant of the other forces. To find the resultant of two forces we make use of the theorem of the parallelogram of forces which may be thus stated. If two forces, acting from the same point be represented in magnitude and direction by two lines meeting at that point, then the resultant of such forces will be represented in magnitude and direction by the diagonal of a parallelogram, of which these lines are the sides; and conversely if the diagonal of a parallelogram represents in magnitude and direction the resultant of two forces, the magnitude and direction of the components is represented by the adjacent sides of the parallelogram.

From these theorems results the principle of the triangle of forces, for it is clear that if the effect produced by any two forces acting on a point is represented in magnitude and direction by the diagonal of a parallelogram, that resultant tends to produce motion in the point in the direction indicated by the diagonal, and with the amount of force represented by its magnitude or length. Now if this point were also acted upon by another force, equal in magnitude to the resultant but opposite in direction, the point would be in equilibrium.

therefore, in our original parallelogram we take two of the sides, one after the other, in order, and the diagonal joining those two sides, to have a triangle in which the three forces, at the two components and their resultant, are now represented in magnitude by the three sides of a triangle. But whereas the direction of the components is still represented by the two sides of the triangle, the third side now represents a force equal in magnitude at opposite in direction to their resultant; hence the point would under those conditions be at rest, and so we have the theorem of the triangle of forces thus stated. If three forces acting upon a point be represented in magnitude and direction by the three sides of a triangle taken in order, they will keep it at rest; conversely if three forces acting upon a point keep it in equilibrium, they may be represented in magnitude and direction by the three sides of a triangle taken in order.

From the triangle of forces it is but one step in advance to the polygon of forces, which may be thus stated:—If any number of forces acting upon a point be represented in magnitude and direction by the sides of a polygon taken in order, they will be in equilibrium; and, similarly, if any number of forces be represented in magnitude and direction by the sides of a polygon taken in order, their resultant will be represented by the line which completes the polygon taken in reverse order.

The principle of the reciprocal diagram of forces is based upon that of the polygon of forces. In the reciprocal diagram each line represents in magnitude and direction a force acting in a truss, whether the truss be simple or complex. As the forces in a truss are in equilibrium, these forces, when represented in a reciprocal diagram, form closed polygons. The application of this system will be best understood by the student if he will follow the working out of some examples, commencing with those of a simple character. The system which we are now studying was first introduced by Professor Clarke-Maxwell, and the method of lettering and working which we shall follow are suggested by Mr. Bow.

The following is Mr. Bow's description of his system of lettering:—"This plan of lettering consists in assigning a particular letter to each enclosed area or space in, and also to each space (enclosed or not) around or bounding the truss, and attaching the same letter to the angle or point of concurrence of lines which represent the area in the diagram of forces. Any internal part of the truss or any line of action of an external force applied to it is to be named from the two letters belonging to the two spaces it separates, and the corresponding line in the reciprocal diagram of forces which represents the forces acting in that part or line, will have its extremities defined by the same two letters."

The advantage of Mr. Bow's system of lettering will be most readily seen by working an example. Let us, therefore, suppose that in fig. 1 we have a simple truss, consisting of two principal rafters and a tie.

In the application of the reciprocal diagram of forces we really require two diagrams, one representing the form of the truss, usually called the "frame diagram," the other the diagram of the forces, which is called the "reciprocal diagram of forces," or sometimes the "diagram of forces" or "stress diagram."

Let us suppose that as a simple example we have a truss as shown in diagram, fig. 1, with a concentrated load at the apex of some determinate amount, say 5 tons. The truss being symmetrical and the load central, this is divided equally between the supports, and their reactions are therefore equal and 2½ tons each. Thus we have three known forces, W , R_1 , and R_2 , whose directions are shown by the arrows. We do not at present know what is the amount of the forces acting in each side of the triangular truss, but we can find out by means of the reciprocal diagram of forces. Our first step is to place a letter to each space bounded by lines that represent the direction of forces. We thus have space A between W and R_1 , space B between W and R_2 , space C between R_1 and R_2 , and space D enclosed by the lines of the truss.

We commence our reciprocal diagram of forces (fig. 2) with our three known forces by drawing a vertical line, this being the direction of the force W , and to scale to represent its magnitude of 5 tons; we letter this line AB, the letters of the spaces on either side of its direction in the frame diagram (fig. 1). We know also the magnitude of R_1 and R_2 . Taking R_1 first, we know that its line in the reciprocal

diagram is A C, and we have already the point A, therefore we draw A C on A B to represent 2½ tons on the same scale as before, similarly B C represents 2½ tons. We complete our reciprocal diagram by drawing from A, a line A D parallel to the side of the truss between the spaces A and D, from B, a line B D parallel

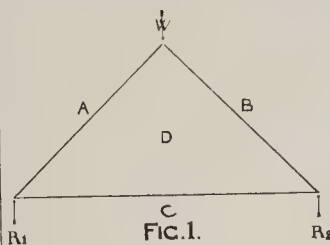


FIG. 1.

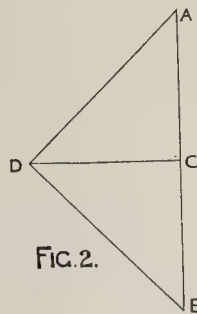


FIG. 2.

to the side of the truss between the spaces B and D, and from C, a line C D parallel to the side between the spaces C and D. Then in our reciprocal diagram the lines A D, C D, and B D represent both the direction and the magnitude of the forces in the sides of the truss to which they are respectively parallel.

GENERAL BUILDING NEWS.

HANWELL PARISH CHURCH.—New chancel and vestries have been erected at this church from the designs of Mr. William Pywell. The original portions of the church were built fifty-seven years ago, from the designs of the late Sir George Gilbert Scott. A chancel was not then provided—the choir occupying the first bay of the nave—and only one vestry was at that time erected, which, however, fell into such a dilapidated condition that fears were entertained for its safety. The only course open was to take the vestry down. The new work comprised the extension of the church eastward by taking out the east end wall and inserting an arch rising from corbelled springers to carry the gable above. The three-light lancet window with its painted glass has been rehewed at the east end of the added portion. The prayer-desks and choir-stalls have been removed from the nave to the chancel, and advantage has been taken of the space thus afforded for providing additional seating to reseat the whole of the nave. Vestries for clergy and choir have been erected on the north side of the chancel. The work has been carried out by Mr. W. Brown, builder, of Southall. The church stands on the site of the parish church erected in 1782. In the vaults was buried Jonas Hanway, founder of the Marine Society, and a co-founder of the Magdalen Hospital, who died in September, 1786. There is a tablet to his memory, between the memorials to Cobden and Charles Buller, in the north transept of Westminster Abbey. G. H. Glassey, the eminent Greek scholar, and the "E. E. A." of the *Gentleman's Magazine*, was appointed Rector of Hanwell in 1785.

RESTORATION OF SPORLE CHURCH, NORFOLK.—The Parish Church of St. Mary, Sporle, is now closed for the purpose of undergoing a further restoration, the principal works undertaken being a new roof to nave and north chancel aisle, taking off, re-casting, and relaying the old lead, taking down and rebuilding the south nave arcade with clearstory over, and reinstatement of the ruined north chapel and sacristy. Messrs. Cornish & Gaymer, builders, of North Walsham, are executing the work, from designs supplied by Mr. H. Green, architect, of Norwich.

CATHOLIC CHURCH, LISBURN.—A new Catholic church, in the Early English style, is being erected at Lisburn. The contract for the building, which will, when finished, cost over 12,000*l.*, has been entrusted to Messrs. H. Lavery & Sons. The

church will be built of white Scrabo stone. The entire area of the building is 140 ft. long by 64 ft. wide, and it is divided into nave and aisles by a colonnade of Scotch stone, with Aberdeen granite introduced. The floor of the body of the church is to be laid with white and black mosaic work, while the sanctuary is finished in glazed encaustic. The tower and spire are designed with the idea of bringing the façade into prominence by projecting the tower clear of the nave. The spire, which will not at present form part of the contract owing to the scarcity of funds, was intended to be built of Armagh limestone, and when finished would have measured 170 ft. from ground to cross. The architects are Messrs. E. & J. Byrne, Dublin.

NEW CHURCH, YARMOUTH.—The Bishop of Norwich has just consecrated a new church, built to meet the increasing needs of the north end of Yarmouth. It takes the place of a small temporary building, and has cost about 1,000*l.* The architects were Messrs. Boffe & Olley, and the builder Mr. Cork, Yarmouth.

METHODIST CHAPEL, BIRMINGHAM.—A new Methodist chapel has just been opened in Ombersley-road. The new building is of red brick, with Bath stone dressings. There will be seating accommodation for 470 people. Two vestries have been provided. The work has been executed by Messrs. G. Webb & Sons, and the architect is Mr. A. H. Goodall, Nottingham. The total cost will be about 2,500*l.*

METHODIST CHAPEL, ARMLEY, YORKSHIRE.—A new Methodist New Connexion Chapel in Hall-lane, Armley, was opened on the 12th ult. The building, which takes the place of an iron structure in Tong-rook, adjoins New Wortley Cemetery. The site of chapel and schools covers an area of 925 square yards. The inside of the chapel consists of nave and side aisles. It is 52 ft. long by 39 ft. wide. A deep recess behind the pulpit forms the organ and choir chamber. Over the vestibule is a small end gallery. The pulpit and Communion railings are of English oak. The chapel provides accommodation for 410 persons. The school, situated behind the chapel, consists of a central hall, 52 ft. long by 28 ft. wide, out of which five class-rooms open. The minister's vestry, a caretaker's house, &c., are placed between the chapel and the school. In the basement is a room for cooking. The architect is Mr. W. S. Braithwaite, of Leeds, and the work has been carried out by the following contractors:—Mr. W. Lolley (brick and mason work), Mr. J. Taylor (carpenter and joiner), Messrs. W. & C. Barrard (plumbers and glaziers), Mr. J. D. Dakin (plasterer), Messrs. J. Atkinson & Son (slaters), Messrs. Newsam, Roberts, & Co. (heating), and Mr. H. Smith (painting).

STABLES, NEWINGTON.—New stables have been erected by the Newington Vestry in Manor-place, Walworth. The builders were Messrs. Balam Bros., and the architect was Mr. Rowland Plunbe.

NEW INFIRMARY, ISLINGTON.—The foundation-stone of the new infirmary, which is to be built on the site of the Small-pox Hospital, Highgate Hill, was laid recently. The building is being erected by Messrs. Kirk & Randall, the architect being Mr. W. Smith.

BUILDING IN ABERDEEN.—At the last meeting of the Plans Committee of the Town Council the aggregate value of the property shown on plans of new buildings approved of was the largest that has ever been dealt with at a single sitting. Included among these was a warehouse near the harbour, with front elevation to Regent Quay. The architect is Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen, and the estimated cost is 12,000*l.* The chief feature in the building trade is the large number of big tenement houses being built, or just about to be built, in the northern part of the city, and also at Sorry, on the south side of the River Dee. The Borough Surveyor, Mr. W. Dyack, C.E., has issued a report (and plan) of a proposed public slaughter-house at Central Park, Kittybrewster—the site which is likely to be recommended for adoption by the Town Council. He estimates the total cost, inclusive of buildings, roadways, railway sidings, and the purchase of the Northern Agricultural Hall (which is at present fitted inside for the sale and storage of cattle), but exclusive of the ground, at 30,000*l.* In the vicinity of the city, house-building is especially active, in the suburban villages of Cults and Culter, and also in the town of Stonehaven. The Great North Railway Company are to erect their new workshops (in the borough of Inverurie) by contract, and have advertised for tenders for the work.

BATHS AND WASH-HOUSES, NEWINGTON.—The baths and wash-houses which have just been erected by the Newington Vestry, at an outlay of over 40,000*l.*, occupy a site in Manor-place, Walworth. The architects were Messrs. Tanson & Son, the builders being Messrs. Balam Bros. The first-class swimming bath for men is 120 ft. long by 40 ft., and is surrounded by a platform and a number of dressing-rooms, with a gallery running all round which ing-rooms, with a gallery running all round which will seat nearly a thousand visitors. The second-class swimming bath is of about the same capacity, only a little longer and narrower. The ladies' swimming bath is 60 ft. in length, 30 ft. across. Slipper baths for both sexes are also provided. A bar is provided where swimmers and bathers may obtain refreshment; while there is also a room for the use of the swimming clubs. The wash-houses are removed somewhat from the swimming baths

The swimming baths will be supplied with water from two artesian wells. The establishment will be lighted throughout with electricity.

WORKMEN'S INSTITUTE, MOUNTAIN ASH.—The laying of the foundation-stone of the new Workmen's Institute at Mountain Ash took place recently. The main building of the institute is to be 94 ft. long by 66 ft. wide over walls, and 61 ft. high to eaves. The front elevation will be red moulded bricks and terra cotta work, relieved by ornamental cornices, &c. On the basement floor provision is made for swimming baths of the length of 61 ft. and 25 ft. wide. On the ground floor provision is made for a reading-room, gymnasium, and lecture-rooms, library, &c. The first floor will consist of one room 92 ft. by 62 ft. by 34 ft. high to ceiling, with rising galleries, stage and proscenium arch. This room will provide sitting accommodation for about 2,000 persons. The building throughout will be heated by steam and the electric light will be supplied. The plans have been prepared by Mr. Dan Lloyd, Aberbeeg, Mon. The contract is in the hands of Messrs. C. Jenkins & Sons, Porth.

VICTORIA HALL, RADSTOCK.—A Jubilee Victoria Hall has just been opened at Radstock. The hall stands on the site of the old Workmen's Club and public baths. The space on the ground floor is devoted to a reading-room and library, while another room will be used for billiards and other games. The hall is overhead. The architect was Mr. W. J. Wilcox, of Bath, the County Surveyor, and the builder was Mr. Joseph Bird.

HOTEL, PADSTOW, CORNWALL.—A new hotel is to be built at Padstow. The architects are Messrs. Crickmay & Sons, Westminster and Weymouth.

OWENS COLLEGE NEW BUILDINGS, MANCHESTER.—The contract for the foundations of the new buildings of the Victoria University, to be erected under the Whitworth Trust, has been given to Mr. Normanton, of Manchester. The site of the new erection is at the corner of Oxford-road and Burlington-street. To all intents and purposes, says the *Manchester Evening News*, the elevation of the new building, which will be known as the Whitworth Hall, will be a duplication of the existing buildings on the right of the tower on the Oxford-road front, but the purpose is to provide a hall suitable for large University gatherings, for concerts, public meetings, for examinations, banquets, &c. The main building will occupy the extreme south-east portion of the grounds of the College, and will be connected with the existing buildings fronting on Oxford-road and on Burlington-street, and will enclose the quadrangle completely. It will continue the existing block in Oxford-street to the end, the new portion being in its exterior appearance very similar to that on the further side of the tower, while it will be connected with the Christie Library (an illustration of which appeared in the *Builder* of November 14, 1896), by low buildings. The apex line of the roof of the Whitworth Hall is to be practically a continuation of that of the older building, divided from it by the tower, and forming part of the same block. The new building is connected with the tower by an archway which is to form the new carriage entrance. The ground floor will be occupied by small rooms to be utilised for various purposes. Two of them will serve as retiring rooms, when the large hall is used for assemblies, and others will be devoted to the several requirements of University offices, for use in examinations, &c. There is one, too, which is especially intended for use when banquets are held in the large hall. The main hall itself occupies the whole of the first floor, the building having only two floors, while the existing structure on the further side of the tower comprises five stories. As the height of the two portions of the whole building will be practically the same, it follows that the main hall will be the height of the upper three stories of the older portion. The hall is to be entered partly from the grand staircase in the old tower, and by the principal entrances for the public, which will be situated in Burlington-street and Oxford-road. There is a large south window in the end overlooking Burlington-street, and this will be flanked by two towers which contain staircases leading to the hall and to the galleries that are to be erected at this end. There are to be no rooms over the hall, which has a high-pitched open timber roof, and this will be filled with open tracery. Provision is being made for the placing of a large organ at the north end of the hall, and the platform, which is to be arranged to accommodate either orchestra or speakers, is of very large extent. The main hall is 121 ft. long by 50 ft. wide. It measures 56 ft. in height from the floor to the inside of the apex of the roof, and 35 ft. to the wall plate. The seating capacity is calculated at close upon 1,000, including the orchestra. The hall will be lighted on each side by five two-light windows, in addition to the large one at the south end. There are two large entrances to it from the main staircase in the tower and from the College, but the public entrances are at the south end. At this end the floor will slope slightly upwards to give a better view of the platform to those who occupy positions at the further end of the hall. When the scheme is completed it will have cost, it is estimated, about 42,000l. The architects are Messrs. A. Waterhouse & Son.

MUNICIPAL BUILDINGS, KINGSTOWN, NEAR DUBLIN.—On the 18th ult., Mr. Charles P. Cotton, Chief Engineering Inspector, Local Government

Board, held an inquiry in the Town Hall, Kingstown, with reference to the application of the Township Commissioners for a loan of 6,600l. for the purpose of erecting municipal buildings, 1,000l. for the purpose of constructing sewers, and 2,000l. for the purpose of laying down concrete footpaths with granolithic pavement or concrete, and to provide kerbing. Mr. Joseph Berry, C.E., Township Engineer, explained the plans of the proposed new municipal buildings, which include new stables, fire station, stores, and workshops. There was no opposition.

EYE INFIRMARY, PAISLEY.—The contracts for the new Eye Infirmary, to be erected by Provost Mackenzie as a Jubilee offering, have been let as follows:—Mason work, Morrison & Muir, Glasgow; brickwork, Robert Martin, Paisley; joiner work, Alexander McNaughton, Paisley; roof tile work, Shaw & Stewart, Paisley; plaster work, D. T. Hutchison, Paisley; plumber work, N. G. Haran & Sons, Paisley; smith work, James Cassels, Paisley. Mr. Charles Davidson, Paisley, is the architect.

PUBLIC BATHS, BOLTON.—The Baths Sub-Committee of the Bolton Sanitary Committee met at the Town Hall recently to inspect plans prepared by Mr. R. K. Freeman, architect, for new public baths adjoining the High-street Library. After due consideration a sketch plan was recommended for adoption, detailed drawings being ordered to be prepared for the purpose of tenders being invited for the carrying out of the work.

RESTORATION AT COCKFIELD HALL, YOXFORD.—The works in the partial rebuilding and enlargement of Cockfield Hall, Yoxford, the seat of Sir Ralph Blore, have been entrusted to the architect, Mr. E. F. Bishopp, architect and Diocesan Surveyor. Mr. Alfred Brown, of Braintree, was the contractor; Messrs. John Groom & Son, Ipswich, executed the carving and chimney-pieces; and Mr. George Beddingfield, Yoxford, the plaster ceilings.

SCHOOL, QUEENSBURY, YORKSHIRE.—The new school erected by the Queensbury School Board at Fox Hill was opened on the 21st ult. The school is built on the central hall system, and is a stone building, affording accommodation for about 275 children. Messrs. John Drake & Son, of Queensbury, have been the architects.

HOTEL, VICTORIA, NEWMARKET.—This building has been erected on the site of the old Greyhound, Newmarket. The hotel is fireproof, and five stories in height, and lighted throughout by electricity produced on the premises by a 40 h.p. gas engine and dynamo placed in the basement. The architect was Mr. Walter Enden.

FACTORY EXTENSION, RUSHDEN.—Additions to Messrs. Cave's factory, Rushden, are now complete. The new building extends from the old factory to the full extent of Alfred-street and along the lane to the "Rose and Crown," High-street. Messrs. Moseley & Anderson, of Northampton, were the architects for the work, and the contractor was Mr. Robert Cosford, of Northampton, the contract price being 7,700l. The new premises are designed to accommodate an additional 500 workmen.

THEATRE, KENNINGTON PARK-ROAD, LONDON.—The latest addition to the suburban places of entertainment is the theatre at Kennington Park-road. It is to be built from the plans of Mr. W. R. G. Sprague. It will, it is said, have frontages of about 80 ft. to Kennington Park-road, 150 ft. to South-place, and 90 ft. to De Laune-street.

SANITARY AND ENGINEERING NEWS.

HULL ELECTRICAL EXHIBITION.—The electrical and industrial exhibition which will be held from May 1 to June 4 next, at Hull, promises to be successful. The principal objects of the exhibition are those connected with the applications of electricity to practical work. It is under distinguished patronage, and we were favourably impressed with the list of gentlemen who had consented to act as jurors and referees. The great demand there is at Hull, which has now a population of 225,000, for electric lighting is necessitating large extensions of the Corporation Electricity Works, and should afford a large field for the supply of materials, fittings, instruments, &c. Manufacturers should take this into consideration. Hull has extensive manufacturing industries, and a very flourishing shipping trade, and a good exhibit of the numerous industrial applications of electric motors, for example, would doubtless create a demand for them.

DRAINAGE SCHEMES, BROMSGROVE.—At the meeting of the Bromsgrove Rural District Council, on the 22nd ult., the schemes of Mr. Martin, engineer, for the drainage of Peddington and Blakedown were adopted. It was decided to endeavor to make an arrangement with the Stourbridge Main Drainage Board to take and deal with the sewage of Pedmore, and the clerk was directed to apply to the Local Government Board for permission to borrow 2,750l. for the Pedmore, and 1,100l. for the Blakedown schemes.

PAVING, &c., SCHEME, CROYDON.—Mr. H. H. Law, C.E., one of the inspectors of the Local Government Board, held an inquiry at the Town Hall, Croydon, a few days ago, into the application

of the County Council to borrow 40,355l. for kerbing, channelling, &c.; 1,475l. for the further improvement of George-street; 7,000l. for Norbur drainage; 550l. for an outfall sewer at South Norbury; and 500l. for an additional settling tank on South Norbury Farm. The first items taken over were the settling tank and the outfall sewer, which cost three, amounting to 8,050l. for drainage purposes. Mr. T. Walker, Borough Engineer, explained the plans in detail to the Inspector, and stated that they had a provisional agreement with Messrs. Carter for land on which to erect the pumping station at Norbury, which was the lowest portion of the borough.

The settling tank would be circular, in form, composed of concrete, and the size would be about 60 ft. in diameter. The outfall sewer would be close to Norwood Junction Station, and was intended to replace very old sewers put in forty or fifty years ago. The proposal was to lay a new sewer through into Love lane, instead of coming down the Harrington-road and meeting at a junction there. In the item of 1,475l. for widening George-street, the Town Clerk stated that the widening was being carried on gradually as premises were pulled down. On the application for permission to borrow 40,355l. for kerbing, channelling, &c., the Town Clerk observed that the item of 8,000l. for kerbing, and 14,500l. for channelling were mainly for actually new works; not for replacing defective ones, but for channelling and kerbing where heretofore there had been none at all. Mr. Morgan, the road surveyor, stated that Val de Travers asphalt was to be used to replace worn out tar-paving. There was an item of 3,083l. for wood paving and concrete for laying in front of shops in narrow footways, and 2,000l. for new granite crossings.

NEW RAILWAY IN BERSHIRE.—The Lambourn Valley Railway, which will bring the town of Lambourn and a number of villages into direct communication with the Great Western system at Newbury Junction, will be opened for traffic on the 4th inst. The line passes through several places which have not as yet had the advantage of railway accommodation, including Speen, Stockrocks, Boxford, Welford, Steffley, East Garston, and East Bury. The works have been carried out by Messrs. Pearson & Co., Westminister.

LOCAL SEWERS IN LONDON.—The Main Drainage Committee of the London County Council has sanctioned the construction of the following local sewers:—Bermondsey: 212 ft. of 9-in. pipe sewer in Channel-row and New Church-street. Fulham: 580 ft. of 12-in. pipe sewer in Imperial-road. Greenwich: 230 ft. of 9-in. pipe sewer in Sandford street, and 560 ft. of 3 ft. by 2 ft. brick sewer, and 60 ft. of 9-in. pipe sewer in Whitcher-street, Woodpecker-road. Hackney: 340 ft. of 12-in. pipe sewer through private ground between Brook's-wall and Coopersale-road. Hammersmith: 360 ft. of 15-in. and 330 ft. of 12-in. pipe sewers in Hamlet gardens, King-street West. Hampstead: 400 ft. of 3 ft. by 2 ft. brick sewer, and 370 ft. of 12-in. pipe and concrete sewer in Honeybourne-road; 544 ft. of 3 ft. by 2 ft. brick sewer and 360 ft. of 12-in. pipe and concrete sewer in Crediton-road. Islington: 136 ft. of 15-in. pipe and concrete sewer in Highbury-crescent West. Lewisham: 730 ft. of 12-in. and 170 ft. of 6-in. pipe and concrete sewer in Homewick-road. Plumstead: 500 ft. of 9-in. pipe and concrete sewer in Church-mark-way. St. Giles: 320 ft. of 4 ft. by 2 ft. 6-in. brick sewer in Great Queen-street; 135 ft. of 12-in. pipe sewer in Galen-place; and 400 ft. of underpinning in Clark's and Smart's buildings. St. Martin-in-the-Fields: 200 ft. and 488 ft. of 4 ft. by 2 ft. 8-in. brick sewer in Chandos-street and Craven-street respectively. Wandsworth: 364 ft. of 12-in. inch pipe and concrete sewer in Bromells-road.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOWS, ALLEYN'S COLLEGE.—Two memorial windows have just been placed in the chapel of Allyn's College of God's Gift, at Dulwich by Messrs. Charles & Ernest Mitchell, in memory of their father, the late Mr. W. J. Mitchell, builder, contractor, and sanitary engineer, of Dulwich, who died on July 1, 1897, and who was for many years a Director of the Builders' Benevolent Institution, a member of the Institute of Builders, and of the Tilers' and Bricklayers' Company. The windows are the work of Messrs. Heaton, Butler, & Bayne.

WINDOW, STANTON-IN-CLEVELAND CHURCH.—The Bishop of Hull dedicated recently a memorial window in the Parish Church, Stanton-in-Cleveland to the memory of the late Mr. William Rhodes Fawcett, of Stanton Grange. The window was the work of Messrs. Heaton, Butler, & Bayne, of London.

WINDOWS, ST. PATRICK'S CATHEDRAL, ARMAGH.—Two stained-glass windows have just been completed in the southern aisle of St. Patrick's Cathedral, Armagh. Each of the windows consists of three lights. Two religious scenes, one above the other, are depicted in each window. The windows have been erected by Messrs. Mayer & Co.

ELECTRIC LIGHTING WORKS, TORQUAY.—Torquay Electric Lighting Works have just been opened. Mr. W. H. Trentham was the electrical engineer.

FOREIGN.

FRANCE.—A group of architects have opened, at 9, Rue Denfert Rochereau, an exhibition of water colour drawings of the Salon de l'Art-en-Ciel.
—The work of restoration on the facade of the church of St. Eustache is completed.—The new Hotel de Ville of Levallois Perret, of which Mr. J. Jamin is the architect, was opened on Sunday last.—A fine bas-relief by Carpeaux, representing the Emperor Napoleon III. resting Abdel Kadir Durbity, has been placed in the Versailles Museum.
—The work formed one of the exhibits at the Salon of 1892.—M. Mania, architect, has been commissioned to erect a new hospital at Longjumeau.—The works for the new railway of the Celles Valley, in the Vosges, are to be commenced shortly, at an estimated cost of 1,750,000 francs.—M. Gillet, architect to the Department of the Marne, has been commissioned to oversee the construction of a circus building at Châlons-sur-Marne.
—The Fine Art Exhibition at Lille was opened on March 25, and will remain open till May 10.—The municipality of Nice have commissioned M. Alfred Lenoir, the sculptor, to execute the monument to be erected there to the memory of the brothers Goncourt.—M. Paul Gout, Government architect, has been commissioned by the Department of Fine Arts to continue the work of restoration at Mont St. Michel, in place of the late M. Petitgrand.—There is talk of commencing, in the Department of Douches du Rhone, works of drainage and irrigation on a large scale, for the whole delta of the Rhone. The operation will, if carried out, mean the reclamation of nearly 100,000 acres of land for agricultural purposes.—A new tidal basin is to be carried out at Boulogne-sur-Mer, at a cost of somewhat over five million francs.—The Municipal Council of Paris intend to erect monuments to Garibaldi and to the Socialist philosopher Fourier.

CALCUTTA.—The equestrian statue of Lord Roberts lately erected at Calcutta was unveiled on March 2 by the Viceroy, Lord Elgin. The statue occupies a site in the centre of the Red-road, on the left of the Victoria Memorial. At either end of the pedestal are allegorical figures symbolising Courage and Fortitude. The friezes encircling the pedestal represent the march from Kabul to Kandahar. Both statue and pedestal were designed by Mr. Harry Bates, A.R.A.

MISCELLANEOUS.

GOOD FRIDAY WEEK.—In consequence of the Easter holidays, next week we go to press a day earlier than usual. All communications for the Editor must reach him by the first post on Wednesday morning, except lists of tenders, which will be received up to a.m. of the same day.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Veronese, fibrous plaster manufacturers, have removed their West End office to 12, Norfolk-street, Strand.

MEMORIAL FOUNTAIN, WALWORTH.—The disused burial ground at the rear of the Browning Hall, York-street, Walworth, is being transformed into the "Browning Garden." A drinking fountain in Doulton ware has been promised by Mr. Lewis Doulton as a memorial of his father, the late Sir Henry Doulton, who was baptised in the building. It is intended to open the garden on the anniversary of Browning's baptism in June next.

CHARING CROSS HOSPITAL.—At the last annual general court of the governors it was announced that the Commissioners of Woods and Forests had agreed to sell on certain conditions for 16,114, the freeholds of Nos. 23-7, King William-street, the site of "Toole's Theatre," and Nos. 15-6, Chandos-street, being the ground upon which it is proposed to build a new out-patient department, with other improvements, for the hospital, when sufficient funds shall have been subscribed.

YORKSHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.—A meeting of the Executive of the Yorkshire Federation of Building Trade Employers was held at the Royal Exchange, Leeds, on the 24th ult. In the absence of the President (Alderman Jessop, Mayor of Huddersfield), Mr. John Spink, of Sheffield, occupied the chair, and there were present representatives from Leeds, Bradford, Hull, Halifax, Huddersfield, and Sheffield. Several matters of interest occupied the attention of the Executive. In connection with the Workmen's Compensation Act a number of suggestions were made in regard to a system of mutual assurances among employers in the building trades. The Executive strongly favoured the idea of such an association, and after inquiries have been made a recommendation will be submitted to the various associations in Yorkshire. An effort is about to be made by means of deputations and circulars to increase the strength of the Federation, and all Yorkshire towns not at present federated are to be visited. The Federation is applying for affiliation with the National Association of Master Builders. Some discussion took place with regard to the custom prevailing among certain architects and engineers of demanding price quantities with every tender at the time of tendering. This is strongly resented by the building trade, and the Executive suggest that the Federation adopt means whereby the practice may be greatly lessened, if not altogether

abolished. The Executive strongly recommended that a uniform contract agreement form should, if possible, be adopted. The demand that has recently been made for an advance of wages in various towns was also under consideration.

PETERHEAD BURGH SURVEYORSHIP.—Mr. J. Chisholm has just been appointed successor to Mr. Alex. Geils, late Burgh Surveyor and Sanitary Inspector, Peterhead.

BROCKLESBY HALL, LINCOLNSHIRE.—The fire that broke out last Saturday at Lord Yarborough's seat destroyed the north-east wing of the house, containing the library and most of the principal apartments—the damage to the building and its contents, including books, pictures, and other works of art, being estimated at 22,000. The picture gallery, measuring 63 ft. by 48 ft., and 20 ft. high, was designed by C. Heathcote Tatham (1806-7) for Charles, first Lord Yarborough, to whom some valuable paintings had been bequeathed by Mr. Aulere, of Chelsea. At the main gates is a stone archway erected by the tenants and others to the memory of the second Earl, *ob.* 1862; in a "riding" in the grounds is the mausoleum built 1787-95 for his ancestor, Baron Yarborough, by James Wyatt. It stands upon an ancient tumulus, and is in the form of a peripteral temple, having twelve fluted Doric columns resting upon a rusticated base or stylobate 50 ft. in diameter; the frieze is carved with griffins and bull-heads. The cella, 40 ft. in outside diameter, has four external niches, circular-headed, with a sarcophagus in each; its interior, divided into four compartments by eight fluted Corinthian pillars, is lighted through the top of a dome, which rises from within a balustrade above the outer entablature. Tatham published in 1811 a folio volume to illustrate the picture gallery and museum of the hall, the latter a view will be found in the second volume of Allen's "Lincolnshire," 4to, 1834.

STATUE, WEST HARTLEPOOL.—The statue of Sir William Gray, West Hartlepool, has just been unveiled. It is situated to the west of Christ Church. The sculptor, Mr. William Day Keyworth, jun., of London and Hull, has represented Sir William during the time that he was Mayor of West Hartlepool, 1887-8, in his robes and chain of office, seated in the chief magistrate's chair.

ELECTRIC LIGHTING AT SOUTHPORT.—Colonel C. H. Luard, C.B., held an inquiry recently at the Southport Town Hall, on behalf of the Local Government Board, into an application by the Southport Town Council for power to borrow 21,198l. for electric lighting and 18,070l. for street improvements. There has been a rapid increase in the demand for electricity, the number of eight-candle power lamps connected having grown from 534 in March, 1895, to 24,609 in March, 1898, while there are applications for 2,000 more. As to the application respecting the street improvements, the Town Clerk (Dr. J. Davies Williams) stated that the Council proposed to repave nearly three miles of streets.

LITANY DESK, BOVEY TRACEY.—A new Litany desk has just been placed in the Church of St. Thomas à Becket, Bovey Tracey. It is of the fifteenth century Gothic style, and is of English oak. The work has been executed by Messrs. Harry Hems & Sons, of Exeter.

THE METROPOLITAN ASYLUMS BOARD.—Sir Edwin Galsworthy presided on the 26th ult. over a meeting of the Metropolitan Asylums Board, held at the County Hall, Spring Gardens. With regard to the contract for alterations and additions at the South-Western Hospital, Mr. T. W. Aldwinckle reported that the total account came to 28,857l., an excess of 4,571l. on the sealed contract. In explanation it was stated that additional foundations were found to be absolutely necessary, while it was impossible to re-use any of the old laundry machinery, thus causing extra expense on engineering work. Drainage was responsible for 886l.; but 370l. was due from the Lambeth Vestry in respect to the new lavatory wall. On the motion of Mr. Scovell, seconded by Mr. Brass, the report was referred to the Finance Committee. According to notice, Mr. Brass moved:—"That the whole question of the expenditure on the Brook Hospital, together with all reports and other documents having reference thereto, be referred to the General Purposes Committee, with directions to instruct a solicitor to take the opinion of counsel as to the liability of the architect, Mr. T. W. Aldwinckle, to refund the managers all or any portion of the costs of the extra works or claims ordered or allowed by him on his own responsibility." Mr. Brass said he had no desire to go over again the circumstances in connection with the large excess on the Brook Hospital contract, but he thought it was absolutely necessary that they should know what the position was with regard to work undertaken by the architect on his own responsibility.—Mr. Purchase thought it was a step in the right direction to ascertain whether the architect had the power to do what he liked with the public purse.—Mr. White said he did not agree with the form of the resolution, but he thought their position with regard to extras generally should be more accurately defined. He moved as an amendment that the whole question of their liability for such charges be referred to the General Purposes Committee, with power to take legal opinion.—The amendment was adopted.

APPOINTMENT OF SANITARY INSPECTORS.—The Local Government Board has sanctioned the appointment as Sanitary Inspectors in the undermentioned districts of—Mr. W. J. Perrin, in Lambeth; Mr. J. R. Bagshaw, in Lewisham; and Mr. J. C. Wilson, in Newington.

FEDERATION OF BUILDING TRADE EMPLOYERS: SUNDERLAND MEETING.—At the Empress Hotel, Sunderland, a few days ago, delegates representing the various master builders' associations in the northern counties again met for the purpose of formulating a code of rules and discussing other matters in connexion with the Northern Federation of Building Trade Employers, which will embrace the counties of Northumberland, Durham, Cumberland, and Westmorland.

CAPITAL AND LABOUR.

WAGES AND HOURS IN THE BIRMINGHAM BUILDING TRADE.—Since last October negotiations have been carried on between the representatives of the builders connected with the Birmingham Master Builders' Association and the representatives of the operatives in the various sections of the trade, excepting the bricklayers, with a view to arriving at an amicable settlement of important matters affecting the industry, and arising out of a series of demands made on behalf of the men. The period for the expiration of the notices issued in October terminated with the close of March, and so far no settlement has been arrived at. Under the arrangements which of late years have worked so admirably between employers and employed, it is stipulated that notices affecting a change in the rate of wages or an alteration of rules shall be given six months in advance, from fixed periods, and it is in accordance with these that the employers were served in October with requisitions for various alterations of rules affecting working hours, &c., and, what was more important still, applications for general advances in wages. The alterations desired in the scale of pay are as follow:—Carpenters from 9d. to 10d. per hour, plasterers 9d. to 10d., masons 9d. to 10d., masons (fixers) 6d. to 7d., plumbers 6d. to 7d., labourers 6d. to 7d., and scaffolders 6d. to 7d. It is asserted by the masters that the advances asked, especially in the skilled trades, are altogether unprecedented, and distinctly out of proportion to the rates of wages paid in other places. For instance, it has invariably been recognised that the rate of pay in the skilled branches of the building trade in London should show an advance of 1d. per hour upon that paid in Birmingham. In the cases cited the advances asked for in Birmingham would bring the scale equal to that existing in the Metropolis. Then, again, it is contended that the present rate of wages in Birmingham is much in advance of such places as Wolverhampton, Leicester, Nottingham, Derby, Rugby, and other places in the Midlands. Probably the most serious aspect for the employers is the vast difference the demanded increases would make in existing contracts. Many of these extend over a long period, and have been accepted on what was considered the settled basis of the scales of pay as now existing. In some cases the employers affirm that it is no exaggeration to say that the granting of the advances would mean the barest of margins for the contractors, if not absolute ruin to many. Therefore, it is sincerely to be hoped that wise counsels among the men will prevail, especially as the employers have expressed their willingness to make such concessions. On the question of the increased pay they are firmly convinced that it cannot be given effect to in any form this year, but have promised an increase of one halfpenny per hour to date from April, 1899, and with regard to a reduction of hours and other minor alterations they are willing for these to come about from the 1st inst. These propositions were submitted to the men some time ago and rejected. The operatives asked for an immediate advance of one halfpenny per hour, and the promise of the other halfpenny next year, and the masters declining a deadlock in the negotiations has existed for some time. The men, however, have requested to meet the masters again in conciliation, and these requests have been granted.—Birmingham Post.

DEWSBURY BUILDERS' LABOURERS.—The Executive Committee of the Spen Valley Builders and Contractors' Association met recently at Cleckheaton to discuss various matters affecting the building trade in the district. Their attention was called to the threatened trade dispute at Dewsbury. The Association had given a week's notice to the Dewsbury Builders and Labourers' Association of a reduction of labourers' wages from 6d. to 5½d. per hour, to commence on March 28, and to extend over a period of six months. This reduction the men have decided to resist. The masters have taken this step in consequence of the proceedings of the men some months ago. It had been previously arranged between the masters and men that either side should give six months' notice of any contemplated reduction or raising of wages, but the men last summer, the masters allege, took advantage of an opportunity when the employers were full of contracts, and gave a week's notice for an advance in wages. This was a distinct breach of the arrangement, and the masters are now giving notice, of the same length of time, to the men to reduce

the wages to the former level, in order that they (if they think fit) might give the proper notice, as originally agreed upon. A deputation from the Association was appointed to discuss the position. The question of altering the name of the Association was considered. The Spen Valley Employed Accident Assurance Company met the same evening, and discussed the position in consequence of the new Workmen's Compensation Act. Negotiations are in progress between some of the companies and the Spen Valley Company.

DISPUTE IN THE CARPENTRY TRADE, COALVILLE, LEICESTERSHIRE.—An adjourned meeting of the Operative Carpenters and Joiners was held at the Red House Hotel recently, when the whole of the shops in the district were represented. After discussion, it was decided to adhere to the id. per hour advance, of which the employers have had due notice, and it was further resolved that unless the advance be granted to stop work on March 31. A deputation was appointed to meet the employers to discuss the question, should it be desired.

COVENTRY PLUMBERS AND MASTER BUILDERS.—The negotiations pending between the Coventry plumbers, painters, and glaziers and the master builders are at present in a condition of deadlock. The masters are determined in their refusal to recognise the new society of plumbers, apart from the Plumbers', Painters' and Glaziers' Society. They are willing to concede the additional 1d. per hour asked for, but will not accept the new rules which would have the effect of limiting the plumbers to plumbing work, whereas they are now what is known as "three-brance-hands," and work at either painting or glazing when there is no plumbing for them to do, receiving throughout the higher rate of wages paid to plumbers.—*Coventry Herald.*

LEGAL.

ACTION AGAINST A PAIGNTON SURVEYOR.

At the Churston County Court, on the 22nd ult., before his Honour Judge Edge, Marcus Bridgman, builder and contractor, of Paignton, sued F. W. Vanstone, architect and surveyor, of Paignton, for 121. 1s. for damage sustained by reason of defects in a bill of quantities supplied by the defendant, and 6l. 10s. balance due for money lent. The sum of 71. 6s. was paid into court, with a denial of liability. Mr. J. B. Eastley, for plaintiff, and Mr. T. W. Windcutt for defendant. Mr. Eastley said that besides acting in his private capacity, defendant was also Surveyor to the District Council of Paignton. In October, 1896, the Council required certain work to be done to Tower-road, Paignton, for which defendant, as their surveyor, had to prepare specifications and plans. Tenders were invited in the usual way, and amongst others who tendered was the plaintiff, who instructed defendant in his private capacity to draw up a bill of quantities. Defendant did so, and added a footnote that "these quantities are not official, but are prepared by the surveyor in his private capacity." It was for gross mistakes made in the bill of quantities, by which plaintiff suffered loss, that the present action was brought. In the specifications it was provided that two lamps should be supplied and connected with the gas mains. In the bill of quantities no distances were given, and plaintiff understood that that meant that the main was close, allowed 45. 6d. for each lamp. As a matter of fact, he had to lay 125 ft. in one case and 170 ft. in the other, costing 81. 10s. Plaintiff, in the first instance, claimed against the Council for the extra amount of piping, and on a reference to arbitration, a verdict was given for the Council on the ground that the bill of quantities was no part of the contract.

Mr. Windcutt suggested that it was the contractor's place to find out where the gas main was, but the Judge said, in that case, what was the good of having a quantity surveyor. If defendant was to argue for the next six months he would not convince him to the contrary. It was certainly his duty to inquire where the gas main was, either of the company or the contractor.

Mr. Windcutt: As I am instructed, it was never the practice for the quantity surveyor to find out distances.

His Honour: If you bring me fifty witnesses, I shall decide against you. It may be the practice, but I shall not give the smallest weight to it. A quantity surveyor would be utterly useless if such a state of things was allowed.

After further argument, defendant, at his own request, entered the witness box, and said it would have made no difference to his bill of quantities if he had known where the gas main was. Plaintiff would have had to ascertain the distance.

Eventually a verdict was entered for plaintiff for 81. 1s., in addition to 71. 6s. paid into Court, total 152. 7s., with costs, payable 2l. a month.—*Western Mercury.*

MEETINGS.

FRIDAY, APRIL 1.

Institution of Junior Engineers (Westminster Palace Hotel).—Mr. J. T. H. Burrell on "Mechanical Refrigeration." 8 p.m.

SATURDAY, APRIL 2.

Architectural Association.—Fifth Spring Visit to

New Public Baths and Free Library, Pitfield-street, Shoreditch. 2.30 p.m.

Royal Institution.—Mr. Lionel Cust on "Portraits as Historical Documents; Portraits as Monuments." I. 3 p.m.

Institution of Junior Engineers.—Visit to the Thames Ironworks, Blackwall. 11 a.m.

British Institute of Certified Carpenters.—Annual Dinner at the Bridge House Hotel, London Bridge, at 6 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Morden Hall Farm, Morden, Surrey. 3 p.m.

Sanitary Institute's Association (Carpenters' Hall, Lower Wall).—Mr. T. J. Moss-Flower on "Sanitation in the Homes of the Working Classes." 6 p.m.

MONDAY, APRIL 4.

Royal Institute of British Architects.—M. G. Harmand, Avocat à la Cour d'Appel, Paris, on "Artistic Copyright." 8 p.m.

Royal Institution.—Mr. Lionel Cust on "Portraits as Historical Documents; Portraits as Monuments." II. 3 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "House Drainage." 8 p.m.

Liverpool Architectural Society.—Mr. W. H. Bidlake on "The Quality of Strength in Architecture." 6 p.m.

Society of Engineers.—Dr. J. C. Thresh on "The Protection of Underground Water Supplies." 7.30 p.m.

TUESDAY, APRIL 5.

Builders' Clerks' Benevolent Institution.—Twentieth annual dinner, King's Hall, Holborn Restaurant. 6 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "Extraordinary Floods in Southern India; their causes and Destructive Effects on Railway Works." By Mr. E. W. Stonery; and, time permitting, Mr. A. H. Preece will read a paper on "The Electricity Supply of London." 8 p.m.

WEDNESDAY, APRIL 6.

Royal Archaeological Institute.—(1) Mr. Talfourd Ely on "The Antiquities of Hayling Island." (2) The Worshipful Chancellor Ferguson on "More Picture Board Dummies." 4 p.m.

British Archaeological Association.—Miss Russell on "Characters of Wolsey's Inscription at Oxford compared with those of Older Ones in Scotland." 8 p.m.

Sanitary Institute.—A discussion will be opened by Mr. R. E. Middleton on "The Desirability of Making Water-shed Areas and Sanitary Districts Co-terminous." 8 p.m.

Crystal Palace School of Practical Engineering.—Announcement of the List of Certificates awarded by the Examiners. Sir Henry C. Mance, President of the Institution of Electrical Engineers, will take the chair at 12 noon.

Builders' Foremen and Clerks of Works Institution.—Ordinary meeting of the members. 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection in the Parish of St. George's, Hanover Square. 2 p.m.

Edinburgh Architectural Association.—Baillie Pollard on "The Fever Hospital Structure; with Special Reference to the New Edinburgh City Hospital, Colinton Mans." 8 p.m.

Edinburgh Architectural Society.—Mr. John Kennedy on "Building Stones: Their Uses and Preparation." 8 p.m.

SATURDAY, APRIL 9.

Edinburgh Architectural Association.—Visit to Dalkeith Palace and Dalkeith Church.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until May 9.

[1896.] 27,356.—**MAKING TACKS, NAILS, AND THE LIKE FROM WIRE.** *M. L. May.*—This is effected by pressing steel plates against one another whereby a circular wire between them is flattened out and shaped primarially; two pressing-checks move about strong pivots, and their even surfaces of contact fit quite closely; a forward motion and a retrograde motion are given in turn by a lever to movable pressing-pins whose cutting corners press the wire into a four-cornered section, and at the same time give it a tapering form, and cut it to the required length.

[1897.] 6,032.—**AUTOMATIC BRAKE FOR HORSES, &c.** *W. T. Eades.*—The lifting wheel of a double-lift pulley block has an automatic break or load-sustainer, so constructed that, whilst it allows the main shaft to have a free circular movement in one or other direction for raising or lowering when turned or driven from the hand wheel end, the shaft is prevented from rotating in either direction on the application of pressure or driving force at the opposite or load wheel end; the brake mechanism comprises a cam-shaped block, loosely mounted, with clearance for lateral play, on the sleeve of the axle bearing placed axially within a circular chamber of the block; during ordinary raising or lowering the outer edges of the expanding parts of the brake are carried round with the axle, but when driving power upon the hand wheel is relieved, the back pressure of the load exerts itself through the load wheel and gear upon the load end of the axle which transmits motion to a radial arm which acts upon the inside of the lug or snag of a cam or wedge, whereupon the expanding motion brings into contact the opposed surfaces of the cam, wedge, and chamber, and causes a jamming action for sustaining the load.

6,388.—**ROLLERS FOR WINDOW BLINDS, SHUTTERS, &c.** *W. C. Kincaid.*—The roller consists of a slotted tube having a cap-piece enclosing a lath or rod over which the looped end of the blind or fabric is passed, whilst the blind hangs down from the lath through the slotted tube.

7,492.—**A WINDOW HINGE.** *F. Krenzin.*—This device, applicable to French sash windows, consists in fixing rotary cramp-irons to the sash and frame, in operating the guiding of each sash by guide-pins fixed above and below the sash, and sliding in groove in the frame.

8,210.—**VENTILATORS.** *A. R. Tiltman.*—The invention relates more especially to inlet ventilators, but is applicable to outlet ventilators; the improvement lies in making the regulating inlet or outlet flap with a transparent part through which the interior of the ventilator box or tube can be inspected; the sheet of glass or other transparent

material forms part of the regulating inlet flap, hinged at its lower edge.

8,484.—**MANUFACTURE OF BRICKS, TILES, &c.** *M. Ahern.*—The inventor mixes together crude shale, calcined shale, Derby sandstone, and clay, in about equal parts; he grinds the mixture fine and makes it up with water (dirty water, as the shale runs from the works, and finds it even better than clean water) for moulding. For red colour, the quantity of sandstone is reduced; for white colour, about one-quarter part of lime or chalk is added.

8,654.—**SYPHON FLUSHING CISTERNS.** *T. W. Woodhouse.*—An essential part of the invention is the arrangement of a lever, applicable to other kinds of cisterns; the lever works upon two fulcra, is divided so as to encircle the upper part of the siphon tube, and has a broad hook engaging in a rectangular slot at the top of the inverted cup.

8,711.—**FIREBRICKS AND DOMESTIC HEATING STOVES.** *W. H. Webber & W. E. Price.*—For firebricks, rocking or removable bars are combined with front firebricks sloping inwards from the bottom to the top, and a sliding perforated draw-plate or blow is provided in the grate casing; the draw-plate is latticed, or of wire-gauze.

9,073.—**SLABS FOR THE BEDS OF BILLIARD TABLES, &c.** *STEELS AND BLOCKS FOR BUILDING PURPOSES, PILARS, COLUMNS, CHIMNEY-POTS, PILES, BATHS, SINKS, AND OTHER HOLLOW ARTICLES OR VESSELS.* *D. Wilson.*—These are made by coating metal frames or cores with, or embedding them in, a cement or concrete consisting of Portland cement, crushed or powdered slate mixed together, the mixture being brought to a convenient consistency immediately prior to use by adding thereto either water or a solution of silicate of soda or potash—say, 1 lb. weight of either to 1 gal. of water.

9,622.—**SYPHON WATER-CLOSETS.** *H. M. Craig.*—To ensure a ready starting of the syphonic action—the siphon is connected to the upper end of the long leg of the syphon just below the point of its junction to the upper end of the outlet, and below the contracted or narrowed part he gradually widens the leg, and then again contracts it at the syphon end.

9,775.—**WHITE LEAD.** *J. S. MacArthur.*—To a solution of lead tartarate formed as is described in his former specification (5,653, 5,693), the inventor adds ammonium before treatment with carbonic acid; an excess of carbonic acid after precipitation may be removed by the addition of fresh lead tartarate. The solution is made of lead oxide and excess; the extension of the spring shows an electric battery into circuit with an alarm bell which continues to ring until the rope is re-tightened. The re-adjustment of the rope is effected by making it end in the nut of which breaks the electric communication when the spring is drawn back into its place.

10,336.—**INDICATING AND CORRECTING UNUSUAL TENSIONS OF MULTIPLE ROPE FOR HORSES, &c.** *R. Middleton.*—Underneath the attachment of each rope is arranged an elastic member—say, a compressed spring—which extends itself whenever such rope is elongated, and adjusting the position of the spring shows an electric battery into circuit with an alarm bell which continues to ring until the rope is re-tightened. The re-adjustment of the rope is effected by making it end in the nut of which breaks the electric communication when the spring is drawn back into its place.

12,255.—**CONTROLLING THE MOVEMENT OF DOORS.** *J. D. Dingle.*—The contrivance, attached to the front or back of the door, comprises a sliding and partially revolving rod raised and lowered by a handle connected therewith by a stud moving, by means of a roller, in a helical slot terminating in a rest.

17,197.—**LADDERS.** *J. Barstow & Sons.*—For a ladder that may serve as either a step ladder or a long ladder, two ladders are coupled together, one within the other, the second rung from the top of the longer or main ladder forming the hinge and serving as the end rung of the shorter ladder. The main ladder's top rung is removable, the second ladder is extended to form a long ladder, and the loose rung is passed through both parts and holds the two rigidly together.

NEW APPLICATIONS.

For week ending March 19.

6,164. C. H. Guest, Acetylene Lamps. 6,171. G. W. Beldam, Manhole Inspection and Similar Coverings. 6,176. F. Dobson, Window Fasteners. 6,178. J. C. Parker, Cooking Ranges. 6,185. G. Kerr, Fastening and Adjusting Door, Window, and Similar Knobs. 6,187. J. Goddard, Cage-Hoist Stopping and Locking Arrangements. 6,195. C. W. Brownson, Door Knob Spindles. 6,206. J. A. Hennessey, Basin Clamps. 6,207. A. Corbin, Trestle for Scaffolding. 6,223. B. C. Seaton, Electric Railway Apparatus. 6,235. J. W. Boddy, Electrical Insulators. 6,239. C. H. Early, Jockeys or Gripping Devices for Mechanical Haulage. 6,240. De Sales & Charbonneau, Liquid Fuel and Heating Contrivances. 6,243. J. A. Rooney, Combined Square and Protractor. 6,244. O'Sullivan, and 6,248. C. E. Cooper, Fire Escapes. 6,245. J. T. Smith, Sash Fasteners. 6,253. Melhuish & Brookes, a Bucket Bottom. 6,254. R. D. Smith, and 6,255. W. H. Side, Solder. 6,259. C. H. Kears, Crushing and Granulating Machines. 6,265. Wates & Cunningham, Enamel Paint. 6,266. P. Rataud, Decoration of Fictile, Glass, Papier-Mâché, Enamelled Iron, Tin, and other Materials. 6,268. R. G. Burn, Cast and Draw Lead Traps. 6,270. Reids, Light River Dredges. 6,278. Annie F. England, for Regulating the Sizes of Fires in Ranges and Grates. 6,284. S. E. Breman, Quenching Oil Paints. 6,285. H. E. Nicholson, Fasteners for Tool Handles. 6,286. E. H. Ristic, Lock Attachment. 6,287. Gillie & Homidge, Electric Switches. 6,295. C. Saintry, Key-Wrenches for Use by Turncocks, Gasfitters, and Others, in operating Stop-cocks or Screw-down Ferrule on House Supplies. 6,292-3. L. Sterne, Condensing and Water Cooling Apparatus, and Cold-storage Buildings. 6,295. N. S. Kikiam, Kompagni (Denmark), Optics Projection Apparatus. 6,296. A. Hills, Filing Machine. 6,298. D. M. Allen, Safety Window-cleaning Device. 6,300. J. Collinge, Flushing Water-closets. 6,303. S. M. Smith, Pipe Wrench. 6,312. G. S. Ross, Window Blinds. 6,314. T. Topping, Electric Plug and Cord Switches. 6,333. Lady Mabel Lindsay, Grip or Clutch Device for Rope, Cords, &c., for Suspending Pulp-

EXMOUTH.—For the erection of detached villa on the Ha Estate, Exmouth. Messrs. Kerley & Ellis, architects, Exm and Salterton. —
A. Hayman.....£1,314 18, H. Dart, Exmouth*....£1,.
* Accepted.

School Board for London.—							
T. Croywys.		G. M. Hammer & Co.		W. H. Lascells & Co.		S. J. Warr & Sons.	
d.	s.	d.	s.	d.	s.	d.	s.
9	10	0	17	0	1	0	2
7	18	0	17	0	1	0	3
5	18	6	17	3	0	0	6
3	15	0	17	3	1	0	6
1	13	0	17	0	1	0	6
1	16	0	12	0	0	1	6
9	14	6	12	6	0	15	0
7	14	6	12	6	0	15	0

new acceptance.

SUTTON.—For the erection of residences, Sutton, Surrey, Messrs. Gordon, Lowther & Ganton, architects.
 Shaplin £2,479 J. Smith & Son £5,750
 Castle & Son 5,045 Humphreys 5,666
 Smeeth & Co. 5,640 Potter 5,645
 Gust. 5,688

TOOTING.—For erecting the London and South-Western Bank at Tooting, Mr. G. Frisch, architect.
 Bank Fittings Total.
 Gregory £3,023 215 £3,238
 Potterton £3,024 215 £3,239
 Candler 3,780 260 4,040
 Cammishell 3,077 245 3,322
 Garrett 3,661 248 3,909
 Ham & Son 3,374 253 3,627
 E. J. Sanders 3,298 199 3,497

WALSALL.—For the erection of school buildings, Whitehall, West Bromwich-road, for the School Board, Messrs. Bailey & McConnell, architects, Bridge-street, Walsall.
 (quantities by the architects)
 H. Wilcock & Co. £2,651 S. Wootton £7,745
 W. & J. Webb 8,419 J. Dallow 7,995
 W. Hopkins 8,595 J. Guest & Sons 7,642
 F. L. Jones 8,131 W. Wistace, Walsall 7,767
 E. J. Lymes 8,331 J. Muller 7,142
 C. A. Horton 8,316 J. H. Whitaker 7,073
 K. M. Hughes 7,921

WIMBLEDON.—For making-up, &c., Olive-grove and several other streets, for the Urban District Council.—
Supermarket-road.
 Jao. Mowlem & Co. £2,864 J. E. Hes, Wimbledon* £598
Olive-grove.
 Jao. Mowlem & Co. £2,577 J. E. Hes, Wimbledon* £479
Fairlaw-road.
 E. Hes £448 Jao. Mowlem & Co., West-minster* £431
 * Accepted.

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the following lists of tenders were submitted by the Works Department:—

DANIEL-STREET.—New school—boys, 258; girls, 258; infants, 22; total, 1,126. The plans also include a Manual Training Centre, Cookery and Laundry Centres, and a Schoolkeeper's house.
 Extra for brickwork in cement.
 Leslie & Co. (Limited) £4,460 0 6 £4,460
 R. A. Yerbury & Sons 23,384 0 0 23,384
 C. Moxon & Sons 21,199 0 0 21,199
 Kilby & Gayford 24,711 0 0 24,711
 Stimpson & Co. 22,592 0 0 22,592
 Clarke & Wrayce 22,609 0 0 22,609
 W. Greyer & Son 22,741 0 0 22,741
 J. Grover & Son 22,750 0 0 22,750
 J. Kirk & Randall 22,957 0 0 22,957
 E. Lawrence & Sons 22,972 0 0 22,972

ELEANOR-ROAD.—Adapting an old house for school-keeper.—
 E. Lawrence & Sons £481 0 0 £481
 Grover & Son 168 0 0 168

ENFIELD-ROAD.—Adapting an old house for school-keeper.—
 Grover & Son £205 0 0 £205
 E. Lawrence & Sons 659 0 0 659
 Hamilton & Spooner 642 0 0 642

HEAD OFFICES.—Providing and fixing mahogany desk with cupboards, &c.—
 F. Sage & Co. £57 0 0 £57
 Lascelles & Co. 46 10 0 46

HEAD OFFICES.—Providing cupboard for plans.—
 F. Spencer & Co. £22 10 0 £22
 T. Cruwys 21 5 0 21

C.B.N. SNEWIN

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PECKHAM-ROAD.—New school boys, 220; girls, 220; infants, 275; total, 715. Manual Training Centre and Divisional Offices.—
 Extra for brickwork in cement.
 Leslie & Co. (Limited) £26,889 13 6 £26,889
 Clarke & Bracey 25,768 0 0 25,768
 E. Lawrence & Sons 17,147 0 0 17,147
 W. Pattison & Sons 24,293 0 0 24,293
 Treasure & Son 24,795 0 0 24,795
 Holloway Bros. 24,815 0 0 24,815
 C. E. Wallis & Sons 24,437 0 0 24,437
 W. Downes 24,418 0 0 24,418
 Edwards & Medway 22,577 0 0 22,577

SMITH-STREET.—Erecting school—boys, 237; girls, 237; infants, 271; total, 745, and special school for children's. Cookery Centre, Manual Training Centre, with playground on roof of school for boys.—
 Extra for brickwork in cement.
 J. Grover & Son £17,451 £17,451
 P. & F. J. Wood 17,349 17,349
 W. Greyer & Son 17,387 17,387
 Treasure & Son 17,370 17,370
 J. Carnahan 17,746 17,746
 H. & R. Roberts 17,747 17,747
 E. Lawrence & Sons 16,649 16,649

VICTORIA (J.M.).—Painting interior and exterior.—
 G. H. Sealey £250 10 0 £250
 H. Flood 175 0 0 175
 C. Gundry 145 0 0 145
 Britton & Earwell 144 15 0 144

WORMINGTON-ROAD.—Re-arranging, re-fitting, and extending boys' offices, altering urinal, and connecting to the existing drainage.—
 W. Hammond £590 J. Marchant & Hirst £593
 Lathley Bros. 519 R. A. Vestary & Sons* 519
 Humphreys & Co. 475
 * Accepted.

London School Board Tenders.—Among the School Board tenders published in our last issue the amount of Mr. F. G. Minter's tender for painting interior "Battersea Park-road," was stated to be £795. It should have been £796.

TO CORRESPONDENTS.

F. H. S. (Amounts should have been stated).
 NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. LXXIV. NO. 2875.

APRIL 9, 1898.

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A Suburban Church.—By Mr. E. B. Lamb	Double-Page Photo-Litho.
Doctors' Consulting Rooms and Residences.—Messrs. Essex, Nicol, & Goodman, Architects	Single-Page Ink-Photo.
The Llewellyn Almshouses, Neath.—Mr. G. E. Halliday, F.R.I.B.A., Architect	Single-Page Ink-Photo.
Grove House, Chiswick	Two Single-Page Tint Blocks.

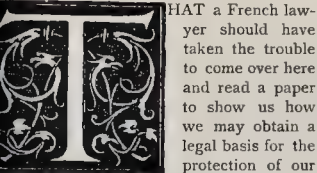
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The Architectural Copyright Question.



THAT a French lawyer should have taken the trouble to come over here and read a paper to show us how we may obtain a legal basis for the protection of our copyright in architectural design is an interesting event in the architectural world; and English architects must feel grateful to M. Harmand for his effort which can only have originated in his interest in assisting what he regards as a movement in favour of abstract right and justice. But we think the subject is complicated with more difficulties than M. Harmand has quite recognised.

Some of these difficulties are perhaps peculiar to our own country. There are two reasons why it should be much easier and more natural for a Frenchman to look on architectural copyright as a feasible project, than for an Englishman. One is that the art or profession of architecture (which we will) is held in much higher respect in France than in England, both by the public and by the legal mind. In France it would be a presumption in a man's favour that he was an architect, because there is a distinct perception that architectural design is a noble and difficult calling; and an architect wishing to defend his rights in a design in a court of law would probably have the predominating feeling of the court on his side; he would at events be regarded as one whose claims it was worth while to consider seriously, and there would be rather a desire to defend them on otherwise. In an English court of law it is just the reverse; an architect is there regarded as a kind of *lusus nature*, or at least as a personage of little importance, whose art no one particularly wants, and whose feelings and opinions in regard to it are mere eccentricities which the legal mind neither comprehends nor cares to comprehend. In France, again, the academical view of architectural design, which regards the design as the personal and individual work of its author, expressed in a series of highly-elaborated and learned drawings, is more generally and decidedly accepted than in England. There are a certain number of

architects in England, of whom and of whose views M. Harmand has probably never heard, who would maintain that the building is much more the work of the craftsman than of the architect, and that a copyright to protect the architect's property in his design would be an attempt to protect what did not or ought not to exist. We consider this a mistake, and that architecture, under the circumstances of modern life, must be regarded as a personal art; but the contrary opinion is one which could not be passed over, and would have to be reckoned with. M. Harmand referred to a period when architects were in the habit of putting their names on the buildings they erected; but that was only in the period of Classic antiquity; and it is noticeable that the French, whose architectural sympathies are so much more Classic than Gothic, occasionally do the same thing now. If architecture were practised now as it was in the mediæval period, a copyright Act in regard to it would be out of the question. We do not think it can be so practised now; but the point can hardly be omitted in considering the subject.

Leaving aside what may be called geographical influences, and coming to the broad view of the question, it is evident that the difficulty of placing architecture on the same footing with other arts in regard to copyright arises from the fact that architecture is so intimately connected with utilitarian work that it is often difficult to say where that ends and the artistic work begins. This was evidently recognised in the judgment delivered by the Tribunal de Première Instance de la Seine, quoted by M. Harmand; where the Judges held that "copyright is granted to every work that comes within the sphere of art, and that the work of an architect in some cases, according to its scope of thought and the merit of its execution, may be and ought to be considered as a work of art." This cautiously expressed judgment is perfectly true, and every one will subscribe to it. But just imagine what a basis for litigation is afforded by such a sentence. Who is to decide, and what evidence is to prove, whether any particular building comes within that definition or not? Any attempts to argue a legal case on such a basis would be like the arguments of Milton's rebel angels, which—

"Found no end, in wandering mazes lost."

Like a patent, a copyright must be for something definite and definable. A patent is a kind of copyright; and a patent can be had for a new method of combining materials to form a floor or a roof, or even for a new artificial material; but not for a general structural principle, since that is the property alike of all thinking minds that are able to grasp principles of construction. Suppose the case of an engineer who had never heard of the principle of cantilever construction, coming for the first time across an example of a large and successful cantilever bridge—could any one prevent him, under any imaginable law, from copying it in a new structure? The principle had always existed; it was not confined to any special material; it is the property of the human intellect at large. Then what would be necessary to bring it within the scope of the judgment just quoted? The existence of some ornamental rivet-heads, for example, which he must not copy, though he may copy the whole structure? That would be admitted by every one to be a ludicrous result, and yet it is an example of what might happen under the application of the judgment of the French Tribunal above cited.

An architect's drawings, as drawings, may no doubt be, under the existing law, the subject of copyright, like other drawings; and it is a rather curious fact, among those mentioned in M. Harmand's paper, that in Germany the architect's copyright in his design is protected as long as it is only in the shape of a drawing, but he loses this if he erects the design as a building. This seems at first blush absurd no doubt; but it probably arose from a perception of the difficulty of applying laws of artistic copyright to buildings, owing to the narrow and indefinable line which separates mere construction from art.

Similarly, the successful arrangement of a plan of a special type, which was a few years ago attempted in this country to be made the subject of a copyright, is, like the cantilever principle of construction, too vague and universally accessible a thing to be made the subject of legislation. It is not new material or a new method of constructing anything; it is simply an arrangement. And it is notorious that a young architect who is going in for a competition for any particular class of building in most cases com-



Fig. 1.—Southampten House and Garden and Staple Inn (Aggas's Map, 1561-1576).

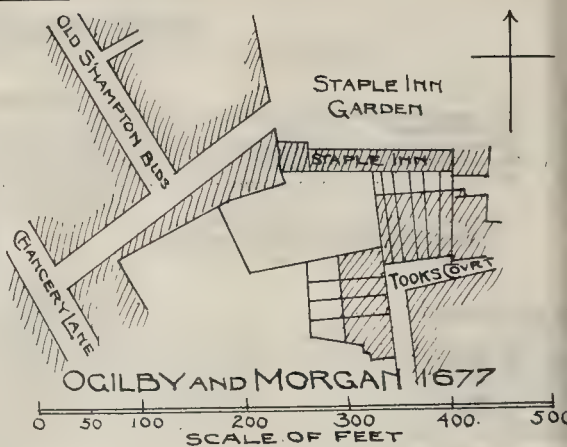


Fig. 2.

menches his work by studying the plans of successful buildings of the same type by more experienced architects, and embodying the results, or some of them, in his own plan. It would hardly be a good thing for architecture, hardly for the good of the public either, if the liberty to do this were curtailed by a Copyright Act.

The one case in which perhaps an architectural Copyright Act might be made to work without leading to confusion of ideas would be that of direct and complete imitation or rebuilding of another man's building. This applies, as the President observed on Monday evening, with special force to small buildings like cottages or villas for an estate, where the same plan and design exactly may be, and sometimes is, reproduced over and over again. Leaving aside the question as to how far the building was an object of art—a question almost impossible for any tribunal to decide, it can at least be decided when a building is a precise imitation of another, or when it comes so near being that as to be what in other cases is called a "colourable imitation." A legal tribunal cannot decide on the question of art, but it would be within its power to decide on the question of imitation. It may be possible thus to prevent a single set of drawings by an architect being used over and over again without his consent and to his prejudice; and this is the one form in which it appears to us that something like a copyright in architecture might be established. The difference between merely taking advantage of an idea in plan or design, and making a complete imitation of a building, is one which can be easily recognised. As an instance, we know that the main idea of the plan of our Houses of Parliament has been imitated in several buildings for a similar purpose, and the architects of those buildings were indebted to Barry for their idea. No one can complain of that. But we should be ill pleased if any other country were to build an exact imitation of our Houses of Parliament; and such a proceeding, if done during the architect's lifetime, would be highly unjust to him, and practically amount to robbing him. It is in this direction, of forbidding sheer imitation or rebuilding, that we think something might

be successfully done in architectural copy-right.

One other point we may touch on. Mr. Harmand, we observe, suggested that though people might draw from public buildings, for study, they should have no right to publish a sketch of one without the consent of the architect, as owner of the copyright in the design. This also will hardly be found, practical or practicable, if we follow it out to its ultimate results. A man has no right to copy an architect's own drawing and publish it, certainly; it is copyrighted as a drawing. But is a traveller, for instance, to be prevented from making sketches of the public buildings and statues (for the two come under the same category here) in the cities he visits, and from inserting them in a book of his travels? The mere statement of this case will show, we think, that the proposal is Quixotic, and such as could not practically be maintained either in law or common sense.

THE PATENT OFFICE BUILDINGS AND THEIR SITE.

WE have noticed in our columns from time to time during the past six or seven years the gradual enlargement and concentration of the Patent Office and its sub-departments by the taking of sites in Took's-court, Cursitor-street; Quality-court, Chancery-lane; and the Garden-court, Staple Inn. In a few weeks will be begun the demolition for the rebuilding of Nos. 27-8, Southampton-buildings and of the old office—the large building that stands within the space between Quality-court (south) and Staple Inn and Southampton-buildings (north). As the structural history of the office gathers around that old building it may be of some interest to give an outline of its story.

Whilst the issue of royal letters patent has been regulated partly by statute, 27 Hen. VIII., c. 11, and partly by long-established practice, our Patent Law runs from the middle of the sixteenth century. Later enactments are very numerous; yet not until the passing of the Act 15 and 16 Vict., c. 83, did the Patent Office have separate existence. At that time there were six offices through which an application

passed before the grant was issued under the Great Seal.* The last-named Act, 1856, set up a Commission consisting of the Lord Chancellor, Master of the Rolls, and the lay officers of the Crown for England, Scotland, and Ireland. Lord Cranworth appointed Bennet Woodcroft, F.R.S., then Professor of Machinery at University College, as Superintendent of Specifications: the office was soon merged in that of Clerk to the Commissioners. The Government bought for £1,000. Woodcroft's indexes of all patents enrolled in Chancery from 1617 to October 1, 1852, and it is mainly to his exertions that the country owes the Free Technical Library (1854) in Southampton-buildings, together with the collection of models and original machines that were removed from Kensington Palace to the House and then to the "Brompton Boilers" (built for them, and recently cleared away) opened as the Patent Office Museum by the Queen on June 22, 1857. Mr. Chamberlain's Act of 1883 dissolved the Commission, converted the Patent Office into a branch of the Board of Trade, and surrendered the Museum, many think very unwisely, to the South Kensington authorities.

(Old) Southampton-buildings was named after the house of the Earls of Southampton, descendants of John Wriothesley, Edward IV.'s Falcon Herald and Richard III.'s Garter King-at-Arms. The third Earl, the patron of Shakespeare, who dedicated him his "Venus and Adonis" and "Rape of Lucrece." New Southampton-buildings, since absorbed in High Holborn, was built on the site of the house, which the Bish of Lincoln bought about the year 1174 from the Templars for 100 marks. It was conveyed in fee to the first Earl of Southampton, temp. Edward VI., demolished in or before 1657: see Howarth's "Londonopolis." Gerard dates his Hen. VIII. "from my house in Holborn, within the suburbs of London, this first of December 1597," and had a physic-garden there: "the whiteblow or whitelaw grass, the English nailwort," he says, "it grows plentifully upon the back wall in Chancery-lane."

* In this order: the Home Office, Chambers of Attorney and Solicitor-General, Patent Bill Office (St. Dunstons), Signet Office (Somerset House), Privy Seal Office, Letters Patent Office (now in Quality-court), and the Lord Chancellor's Office for seal



Fig. 3.

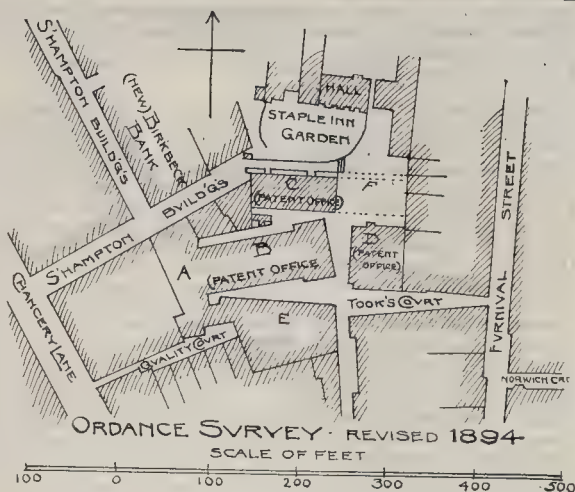


Fig. 4.

A. Masters in Chancery.

B. Staple Inn.

1. Gray's Inn Gate.

2. Gray's Inn-lane (now "rowl").

3. Middle-row.

4. "King's Head."

5. Jenin's-court.

6. Staple Inn-buildings.

7. Northumberland-court.

8. Southampton-court.

9. Quality-court.

10. Holborn Bars.

A. Old Office.

B. Old Office and Library.

C. Taxing Masters (1843: Site of 12 and 13, Staple Inn).

D. Court Room Block.

E. Sales Branch.

F. Site of 11, Staple Inn (pulled down November, 1893).



Fig. 5.—No. 11, Staple Inn. (Pulled down in 1893.)

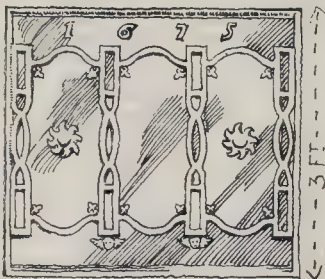


Fig. 6.

Front of Leaden Cistern from Basement of No. 9, Took's-court, Cursitor-street, pulled down in 1891.*

ie belonging to the Earl of Southampton." The garden extended, it appears, across what are now the north and west arms of Southampton-buildings, being the large garden shown in the map of Velagio, circa 1500, the map attributed to Hoefnagel in 1594, and Hogenberg's "Civitates Orbis Terrarum," 1572-3 (done before 1561, for St. Ul's has the spire), and by Aggas (fig. 1), reaching along Chancery-lane to Symond's n. (Old) Southampton-buildings, whilst in Ryther's map, second edit. 1608, or Porter's, 1654, is laid out by Newcourt, 1658, and by De Wit, Overton, and Dvork, 1666. Stow says also the house joined the old Temple, of which the eastern portion was pulled down in 1595. Cunningham writes (1850) that parts of the use still remained where are now No. 322, High Holborn, and No. 47, "The Blue Posts," Southampton-buildings. Some twenty years ago, in the course of excavations behind the London and County Bank, Nos.

324-5, High Holborn, were discovered remains of the Templars' first round church, of a chamber with tiled flooring, and of red-brick walls—these last were considered to have belonged to the house for whose foundations some of the chalk and stone of the Temple had been used.

Those, therefore, are wrong who say that the Patent Office occupies the site of Southampton House. Turning to the map of the City "made by John Ogilby, Esquire, and William Morgan, his Majesty's Cosmographer," in 1677 (fig. 2), we see that nearly all the ground now covered by the office is unoccupied except by the south block of Staple Inn—since numbered 11, 12, 13—and houses at the north-west angle of Duck's-st., Duke's, or Took's-court. With Ogilby and Morgan's map, part of which was engraved by Hollar shortly before his death, almost exactly corresponds R. Bloome's plan, 1755, of St. Andrew's, Holborn, parish. Having examined a large number of eighteenth-

century maps and surveys,† we find the same vacant space recurs; it seems, indeed, never to have been built upon, and lay just without the limits of the Great Fire. We come then to R. Horwood's map (fig. 3), scale about 2 ft. 1 in. to a mile, first published in thirty-two sheets in 1794-9, Ash being the engraver. There, on one of the sheets dated 1795-7, is plotted "Master Chancery [sic] Office," as newly erected, in pursuance of 33 Geo. III., c. 42—"An Act . . . for building offices for the Masters in Ordinary in Chancery . . . and offices for the Secretaries of Bankrupts and Lunatics," on the site of Nos. 25-6, Southampton-buildings. It is a substantial fabric, having two stone fronts, a passage through lighted by two cupolas, and a spacious landing, with alcove on the first

* The cistern was sold, along with the rest of the materials on the site, 44. 10s., was paid for it.

† See particularly those by T. Bowles, 1737 and 1742; Roque, 1741-5; Basire and Searle (from Roque), 1749; Ellis, Foster, 1752; Kitchen and Sayer, 1775; Lawrie and Whittle, 1776.

floor. The Quality-court front, narrower than the other, consists of a rusticated ground floor, with an upper story of four fluted half-engaged Roman Doric columns and an angle pediment; the north front is similar, whilst the upper floor has two corner fluted pilasters and four columns, with entablature, and a central parapet, blocked with three panels, between balustrades. The design is traditionally ascribed to Chambers (*ob.* 1796). A small portion of the north front was depicted in our illustration, March 25, 1893, of the new premises next west. On the sides of the south entrance are two doors, now closed, leading to the Bankruptcy and Lunacy offices, since removed: an ominous collocation of Government departments. The Masters (now Registrars) moved from Symond's-inn, Chancery-lane, into that building, A, fig. 4, to which was afterwards added the long block, B, having a basement and, originally, two floors, solidly built, with turned and vaulted ceilings, good joinery work, and oak flooring: the roof was flat and covered with copper. Until the completion of the Royal Courts of Justice, blocks A and B were occupied by the Chancery Registrars, on the first floor, and the Patent staff. The Designs staff succeeded the Lunacy branch in the rooms, on the north side of Quality-court, entered from the cross passage. The Patents Reference Library was put in the long passage on the ground floor, B; an inconvenient arrangement, remedied by the erection of the Library, after Pennethorne's designs, in 1866-7, above the first floor, extended eastwards to cover the entire floor in 1885-6. Nos. 12-13, Staple Inn, were rebuilt 1842-3, with an advanced frontage and raised terrace, after a design in the Jacobean style by Wigg & Pownall, for the Taxing Masters in Chancery; the block C has been re-arranged within for occupation by the Patent staff. The adjoining block eastwards, F, built in alignment, and with a corresponding elevation, was erected in 1894-5 by the Office of Works, Sir John Taylor being the architect, on the site of No. 11, Staple Inn (fig. 5), its oldest part, excepting the Holborn front. The doorway had an inscription:—

Reedificata Anno Dni, 1699.
Roberto Browne, Gen. Principali.

In 1891-3 the Office of Works had erected the block in the rear, D, containing the Comptroller-General's Court-room, on the site of old houses, Nos. 5, 8, 9, and 10, with their large gardens, along the north side of Took's-court, when were found, in No. 9, a leaden cistern richly ornamented in relief (fig. 6), with date "1675," and within a bricked chamber 14 ft. deep below the garden surface a great quantity of seventeenth-century tobacco-pipes, specimens of which are deposited in the Guildhall Museum. In 1892 were taken the sites of houses and gardens on the west side of Took's-court, with premises at the east end of Quality-court, for the Patent Office Sales Branch (E, fig. 4), then quartered in Cursitor-street; two of the houses in Took's-court had been occupied by the late John Francis, and by his son, for the printing and publishing of *Notes and Queries* and the *Athenæum*. The court, whose name has assumed many changes, appears, unnamed, in Hollar's map of 1675, and as Duck's-court in the index to Ogilby and Morgan's—it is called, perhaps, after Thomas Tuck, whose benefaction of 2l. per annum to

the parish poor was recorded on a tablet set up in St. Andrew's, Holborn, in the year 1673.

NOTES.

The Telephone Service. THE proposed appointment by the Government of a Select Committee to inquire into the question of the Telephone Service, though its action will be limited, appears to be a step in the right direction. The debate in the House of Commons last week shows that the present state of things cannot be allowed to continue. The National Telephone Company has acquired a practical monopoly. That the Government may be a competitor there can be no denying, and as the National Telephone Company is aware that it has no legal monopoly, it cannot complain of any injustice if the Government grants licences to such municipal corporations as may ask for them. If the Government may manage telegraphs and telephones, it is clear that theologically there is nothing to say against a local body doing the same, as the agent, so to speak, of the central government. Of one thing there can be no doubt, that England must not be deprived, as she almost entirely is now, of this great public convenience. Already on the Continent quite small communities make use of the telephone, to the great dispatch of all kinds of business. In a vast city such as London it should be possible for persons to be able to communicate with each other by the telephone without delay and at a small cost.

Scotch Private Parliamentary Measures. THE Bill to alter the procedure in regard to such business from Scotland as has now to come before a Committee of the House of Commons was read a second time on Monday, but with a general chorus of disapproval. Mr. Balfour made no secret of the fact that, under the circumstances, the Bill was practically dead. There is no doubt a general feeling that the procedure before Parliamentary Committees is not altogether satisfactory; but whether any change will be made is doubtful. It seems at first sight absurd as well as expensive to bring up witnesses, say, from Dublin or Glasgow to London if a railway Bill which affects these places is under investigation; but, after all, the facilities for getting up to London are so much increased that it is clear that, from a business point of view, London has become a more convenient place for hearing these matters than it used to be. We do not, therefore, look forward to any change in the existing system.

Beauty in Engineering Design. AN address on this subject by Mr. Fuhrmann Clarke, delivered to the members of the Birmingham Municipal Technical School Engineering Society, of which a brief report appears in another column, shows once more the curious confusion of mind under which engineers labour as to what it is that architects and artists complain of in their work. Mr. Clarke pointed out that "engineering designs and most engineering materials were not to be improved by the addition of architectural adornment." That is exactly what we have been urging over and over again. The thing which architects most complain of on the part of engineers is their bedizenizing their works with bad ornament which has nothing

to do with the construction, or with "design" in the real sense of the word. Mr. Clarke, like other engineers, evidently regards "architecture" as something extraneous that can be put on to a structure in an arbitrary manner. He would find architects the first to repudiate such an idea. Mr. Clarke mentioned with admiration London and Waterloo Bridges and Menai Suspension Bridge, every architect will agree with him there, but if he considers the majority of recent engineering works are comparable to the in simplicity and dignity of design we feel we shall be at issue with him.

The Aqueduct of Theagenes at Megara. THE *Berliner Philologisches Wochenschrift* for March reports that Dr. Dörpfeld has been making topographical investigations at Megara with a view to establishing the character and direction of the famous water-works at Theagenes. According to Dörpfeld, they present a marked and interesting analogy to those constructed by Peisistratos with a view to supplying the market place at Athens. The water was brought from the high ground at the north of Megara by subterranean canals pierced through the Acropolis and leading to the market place. Dr. Dörpfeld also claims to have made out the peribolos of the city, the two citadels, and the long walls, and the position of the harbours of Nisaia and Minoa.

The Austrian School at Athens. FROM Athens we also learn that the newly-established archaeological school of Austria has appointed its two directors—Herr Reichel and Herr Wilhelm. We congratulate the new school on having secured two of the most brilliant of the younger archaeologists. Herr Reichel is known throughout Europe for his work on Homeric armour, and more recently for his brilliant monograph on "P. Hellenic cults." Herr Wilhelm has made less a mark in the domain of epigraphy.

Marine Aquarium for Paris. THE Municipal Council of Paris has authorised MM. Albert and Henri Guillaume, architects, to construct a marine aquarium between the Pont d'Alma and the Pont des Invalides. This establishment, which will remain at the close of the Exhibition, will be on a large scale and include as varied a collection as possible of marine fauna and flora. The plans that are in preparation for the building promise a very original treatment.

Corporations as Shopkeepers. THE judgment which Judge Wightman Wood delivered in the action brought by the Leicester Corporation against Mr. Hill, local contractor, for a small sum due for electric light fittings supplied to him, is important, as it affects the question of the right of a Corporation to keep what Judge called an "emporium" for the supply of electric light fittings. In his summing-up, he stated that he could see nothing in any of the electric lighting Acts to give a Local Authority power to supply any intermediate fittings for the supply of electric light. Internal fittings are, of course, everything on the consumer's side of the meter, and the question was a very important one to be decided in a County Court, leave of appeal to a higher court has been granted. When the Leicester Corporation first began

supply their clients and others with electric light fittings we mentioned that we thought that they were going beyond their legal rights. From an equitable point of view, it seems very hard at local shopkeepers who are ratepayers would have to compete against their own corporation, especially as the electric light inspectors are Corporation officials. Another legal point which wants clearing up is whether a Corporation is not acting *ultra vires* in collecting the rents of a private company like the so-called "free wiring companies," as until all the payments are completed the legal ownership of the internal wires and fittings supplied is vested in the local Authority. Shoreditch Vestry, for example, has recently entered into a working arrangement with the "National Free-wiring Company." The Leicester case seems also to have a bearing on the question of the giving of glow lamps by Corporations as a rebate on their consumers' bills.

THIS seems to be another bad competition case. The Board of Guardians advertised premiums of 150*l.*, 100*l.*, and 50*l.*, which were duly awarded under the advice of a professional assessor, who awarded the first premium to Messrs. Crickmay & Son, London, and the second to a local firm, Messrs. Haywood & Harrison, of Lytham and Accrington. The Board, however, decided to give the work to the second-premated firm, and the Chairman, in announcing this, incautiously remarked that special conditions had been inserted to the effect that the Board reserved to themselves the right to select any of the three premiated architects, and that this condition had been inserted with a view of having a local man." Then why did they not confine the competition to local architects? We may add that we do not see any such statement in so many words in the "conditions." We read that the premium of the architect selected to carry out the work will merge in the commission, a sentence which no doubt implies that a choice would be exercised, and ought to have put competitors on their guard; but it is evident enough from the Chairman's remark above quoted that there was a pre-conceived intention of employing a local architect, and therefore that the open competition was a mere piece of amusement, at the expense of the competing architects.

DR. W. W. E. FLETCHER'S report to the Local Government Board on the prevalence of diphtheria in the Chipping Norton Rural District, seems to show a very insanitary state of things in some portions of the district. None of the villages visited have proper drainage arrangements, though drainage of a kind is usually provided. Excrement disposal is almost entirely effected by means of ordinary cesspit-privies, of pail-closets, the cleansing of which is performed by the occupiers of the premises in which the closets belong. House accommodation is generally of such a kind as to render isolation impossible. This latter incident seems to have had an important influence on the spread of infection, while quite contrary to usual experiences) the origin of the diphtheria cannot be directly traced to the defective drainage or other sanitary conditions. Dr. Fletcher observes

that throughout his inquiry careful attention was paid to questions of water-supply, condition of dwellings, drainage, and excrement disposal; but no evidence was obtained which would tend to incriminate any one of them. This is, at all events, a very unusual result of such an inquiry.

Leicester-square. PROGRESS is being made with the rebuilding of the Hôtel de Paris at the north-east corner of the square, and adjoining the Empire Theatre. Messrs. Saville & Martin are the architects: the contractors are Messrs. Patman & Fotheringham, of Islington, N. The site was formerly occupied by old Leicester House, built *circa* 1635, for Robert Sidney, second Earl of Leicester, father of Algernon Sidney, of Henry—the handsome Sidney of the De Grammont memoirs—and of the Lady Dorothy, Waller's "Sacharissa." The ground had been part of some lammass land granted to his ancestor Lord De L'Isle and Izes by Henry VIII., for which it is known he made certain yearly payments. Dryden, then living in Gerrard-street, dedicated his "Don Sebastian" to the Earl of Leicester, and describes himself as a poor inhabitant of his lordship's suburbs, whose best prospect is on the garden of Leicester House. Lisle-street was built over the garden in 1791, and the house was pulled down about the same time. It is "the putting-place of princes" of Pennant's often-quoted phrase, having been the home of George II. when Prince of Wales, and, in 1743-51, of his son Frederick; it was also the occasional residence of George III. before he succeeded to the throne, and there his accession was proclaimed. Leicester House—which had been the last home of the Princess Elizabeth, titular Queen of Bohemia, who died there on February 13, 1661—was afterwards occupied by George II.'s son, William Duke of Gloucester, on his marriage with Maria, Countess-Dowager of Waldegrave (mother of the three Ladies Waldegrave painted by Sir Joshua Reynolds), and then by Sir Ashton Lever, for his museum. Sutton Nicholls's prints of 1721 and 1754 show the house as having a left wing and a spacious forecourt to the south, the house next west being the Earl of Ailesbury's, since Saville House, where now stands the Empire Theatre.

Great Hampden Church, Bucks. A STAINED-GLASS window has been placed by public subscription in St. Mary Magdalen parish church as a memorial of John Hampden. The church stands at the end of a grove of limes close by the garden of his home, on a ridge of the Chilterns, and amidst a woodland scene of singular beauty. His body was carried thither from Thame; the register records his burial on June 25, 1643, but notwithstanding the examination of his supposed remains by Lord Nugent, on July 21, 1828, the precise position of his grave, and, indeed, the actual manner of his mortal wound, are alike unknown. On the monument erected in the church *circa* 1754, by the Hon. Robert Trevor, afterwards Lord Hampden, who had succeeded to the property on the death of John Hampden's last male heir, Chalgrove Church is shown as having a spire, and the costumes are not of the period. In 1893 the restoration of the church was entrusted to Mr. J. Oldrid Scott, at an estimated cost of 1,963*l.* In a "Note"

on August 11, 1888, we gave some particulars of the descent of the estate, and of the brasses in the church: in Vol. x. of the Art Union, 1848, will be found some charming woodcuts, by F. W. Fairholt, illustrating the church's interior and exterior, the monument, the memorial on Chalgrove Field, and the house at Thame wherein, it is supposed, Hampden died on Sunday, June 24.

The Australian Art Exhibition. THE collection in London of a number of pictures painted in Australia by Australian artists was a good idea, as giving us an indication of the state of art in Australia, though one hardly sees the promise as yet of a new school of Australian art. The exhibition introduces us to one able landscape painter, Mr. W. Lister-Lister, whose "Passing Shower" and "Graham's Valley," and some others, show really fine qualities; Mr. Sydney Long and Mr. Arthur Streeton contribute some effective landscapes of rather impressionist character; Mr. Tom Roberts's "The Golden Fleece" is an interesting study of local industry and character, and the same artist paints one or two heads of aborigines in a forcible manner. One or two pictures, such as Mr. Streeton's "Hawkesbury River," seem to give us a local character of scenery, but in general the landscapes do not suggest anything apart from European locality and style. Mr. Pignatelli's "Flood in the Darling" is only Heffner over again, and other works in the exhibition suggest French influence at second-hand.

The Opera Comique, Paris. THE new Opera Comique is to be completely finished in October next, according to the engagement entered into by the Government. The Minister of Fine Arts, in consequence, is demanding from the Chamber of Deputies, in view of the completion of the works, a new credit of 920,000 francs in addition to the expenditure already authorised, and which amounts to 3,425,000 francs.

THE STATE OF NORWICH CATHEDRAL.

As a good deal has been said lately in the papers as to the state of Norwich Cathedral, and the need for repair to various parts of the fabric, the following statement from the Dean on the subject may be of interest:—

"Dear Sir,—I have very little to report as to the existing dilapidation of the fabric of the Cathedral. Exclude the west front, which was cruelly maltreated in days gone by, and St. Anne's Chapel on east side of the north transept, and the dilapidation has given place to such repair as will endure, in all probability, for centuries. Beginning at the south-east, from our Chapter Clerk's Office, continue round the east end, then to the north-east—which Mr. Person's report described as in 'a pitiable condition'—include the east, north, and west sides of the north transept, and continue along the whole length of the north side of the nave aisle, and all is perfect. Not one inch of sound old work has been interfered with. Nothing has been done except to replace decayed by sound stone. We are now at the south side, and I am in strong and intelligent hope that in twelve months the fabric of Norwich Cathedral will have been placed beyond the need of any further repair than may be rendered necessary by the silent deterioration of time or by some destructive tornado. So far the Cathedral is and will be perfectly secure. No structural alteration is allowed. All has been done under Mr. Pearson's report.

"The cloister, however, is, in parts, in a pitiable and, if I may so say, a most pathetic condition. The ashlar surface is, over a wide area, in ruin. The exquisite tracery, in each of the styles represented, is crumbling. Several

pillars have already fallen away. The parapet of the north side—the latest in construction—is bulged. I saw this for the first time on Monday morning by getting through a window and ascending to the broad walk. Then the line of the parapet was revealed. This need not necessarily mean danger; but as to this, as well as to the mode of repair, the quality of stone to be used, and every other point, the best opinion shall be secured, the most painful care shall be given, and the utmost patience in thought, in study, and even in work.

I have collected all over Norfolk and Suffolk all the funds which have enabled us to prosecute the repair from 1891-98. I doubt very much if more money can be raised in an area which has been already gleaned; and unless my judgment as to the condition or liabilities of the cloister is so corrected by the best opinion the Dean and Chapter can secure as to lead me to believe that repair may not be safely deferred, I shall consider it my duty to allow the next Dean and the next generation to do for the cloister what we have done for the cathedral.

"May I say we have completed a method of drainage which will save the cloister foundations from an influence which must, had it been suffered to continue, have brought the superstructure down. The whole of the rainfall on the south side of the nave came into the garth. It was received in two pits, which, while bricked round, were unbricked at the bottom. Provision was thus made for an increasing bed of perpetual ooze, which no doubt affected the whole area. We have now constructed a cement channel and a bevelled course. From the latter, as well as from the spouts, the rainfall is carried into the channel. It flows by a new drain into the larger drain of the Close. This I regard as one of the safest works we have attempted.—Most truly yours,

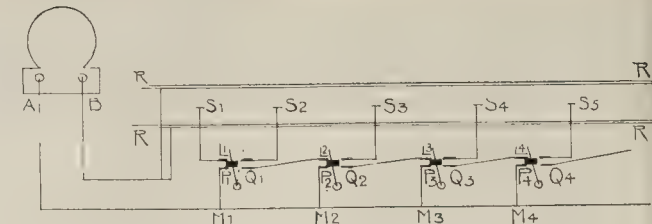
"WILLIAM LEFROY, D.D.,
Dean.

"The Deanery, Norwich, March 30, 1898."

A NEW SYSTEM OF ELECTRIC TRACTION.

Of the three systems of electric traction which have been practically adopted in public thoroughfares, the surface contact system appears to us to be the most suitable for crowded streets. The only difference between the appearance of the track for this kind of electric tramway and for a horse tramway is the appearance at distances varying from three to six yards, of little rounded iron studs, which project about three-eighths of an inch above the roadway, and which are no obstruction whatever to the other traffic. If such a system can be made absolutely reliable, and if the track can be constructed at a cost not more than about twenty or thirty per cent. greater than the cost of the overhead trolley system, then it can economically and advantageously replace horse traction in many of the London tramways. In Paris a surface contact tramway has been in operation for the last two years, and has apparently given satisfaction. One great drawback to the Paris line, however, is the great complication of the electrical connexions necessary, as such complication must detract from the absolute trustworthiness of the system. The Westinghouse system, which we described two years ago, has not made much progress in this country, as experts, rightly or wrongly, are sceptical as to the reliability of the two or three cells carried by the car to energise the underground electric switches, as they have to work through two bad rubbing contacts.

In order to understand the main difficulty that has to be overcome in designing a surface contact tramway we will state shortly the problem. Metal knobs are placed about every six yards between the rails. When the car passes over them a rubbing contact is made between the knobs and the positive poles of the motors by means of a collector-bar carried underneath the car, the other poles of the motors being connected to the rails through the wheels. Now, as the working voltage for electric tramways is 500 or 550 volts the knobs must only be connected to the high-pressure underground main when they are underneath the car, and the moment the car passes over them they must be disconnected from the main. It would be highly dangerous if one of the knobs were accidentally left alive after the car had passed over it; on a wet day a horse tramping on it would be almost certainly killed,



Principle of the Kingsland Electric Tramway.

and a man would get a very severe, if not necessarily, fatal shock. Any possibility of this occurring must, therefore, be absolutely guarded against. Various methods of switching on a knob to the main the moment the car gets over it, and switching it off again the moment the car passes it, have been invented. Sometimes cells carried on the car actuate underground switches by means of a second set of knobs, and a second collector-bar, or sometimes a heavy electro-magnet, carried by the car itself, is used to actuate them. In Mr. Kingsland's system, which we will now describe, the electric arrangements of the car are practically the same as in the trolley system, the only difference being that the trolley pole on the top of the car is replaced by a collector-bar underneath.

In order to explain briefly the principle of the Kingsland system, we shall describe it as if the switches were worked mechanically by the car instead of electrically, and it will be seen that the method is not unlike that employed to enable an electric lamp to be controlled from two separate switches.

In the figure let S₁, S₂,... be the knobs in the centre of the track and R, R' be the rails. Let A, B be the terminals of the dynamo at the power station, the high-pressure terminal A being connected to the underground main M₁, M₂,... and B being connected to the rails. P₁, Q₁, P₂, Q₂,... are switches, and L₁, L₂,... levers which we may suppose actuated by the car. In the figure the car is supposed to be over the stud S₁, which is the only one connected to the main M. If now we close the motor circuit on the car, the current can flow from A through M₁, P₁, S₁, and R to B, and the motors will begin to turn round and move the car forward. When the collector-bar touches S₂ the lever L₁ is moved over, and makes connexion between Q₁ and S₂ and therefore between M₂ and S₂, and it will also be seen that the connexion between M₁ and S₁ is broken. Mr. Kingsland so arranges his switches that the circuit between S₁ and M₁ is not broken until after the circuit between S₂ and M₂ is made. Hence the current supplied to the motors is continuous and there is not the slightest sparking at the switches. An inspection of the figure will show that the car automatically switches in a stud as the collector-bar touches it, and at the same time switches off the preceding stud.

Instead of having mechanical levers, Mr. Kingsland uses a very effective form of magnetic switch which acts with the greatest certainty. If by any mischance one of these switches failed to act, then the car must stop, and the fault could be at once discovered and remedied. The switches are made to go into cast-iron boxes, the covers of which are 8 in. by 10 in. The cable connexions go in through water-tight glands, and are so connected to the switches that they can be readily taken out for inspection. These boxes and studs will be placed at distances of from 5 yds. to 6 yds. from each other, along the line, but at sharp curves they will have to be placed closer together.

We have seen a working model of this tramway which Mr. Kingsland is exhibiting at the Electrical Standardising Institution, Faraday House, Charing Cross-road, and also specimens of his switches. He informs us that the cost of the track and all accessories is between 5,000l. and 6,000l. per mile. As the cost of the overhead system is between 4,000l. and 5,000l. per mile and of the conduit system is over 6,000l. per mile, it seems worth the attention of the many local authorities who are hesitating as to what system of electric traction to adopt.

A NOTE ON HERALDIC DRAWING.

In his interesting paper on this subject, read before the Institute of Architects a fortnight ago, Mr. Crace, in order to explain the origin of the wreath or torse, exhibited a model of a helm with its accessories, the crest being attached to the mantling and the whole tied to the helm by the wreath. As a parallel case, he pointed to the cord or small puggari by which the Arabs secure the drapery on to their heads, and of which the leathern thong that appeared in the early thirteenth century as a means of steadying the mail coif over the chapelle-de-fer is an European equivalent. But in deriving the wreath from a band whose first duty is to tie something to the helm, there seems a possibility that a mistake is made, and of this possibility the first suggestion lies in the fact that the wreath is always depicted as twisted, and that its older name of "torse" implies something twisted. If it were a mere cord in use, it is simplest and truly heraldic form would be the plain line of a flat leathern thong. The second suggestion is connected with the small bascinet—the successor of the chapelle-de-fer. This was a pointed skull-cap with camail or gorget of chainwork secured to its lower edge by leather thong, and over it was worn in battle of tourney the great helm. To deaden the noise and shock of a blow on the helm, it is natural to imagine a torse of some soft material placed puggari-wise on the bascinet, and such a torse is sometimes shown, without crest or mantling upon the vizorless bascinets of this period. The present writer imagines this to be the true origin of the wreath. The crest—sometimes a very heavy affair of wood and metal—was often, as existing samples show, fixed directly to the helm without the use of mantling. The mantling possibly developed from the down hanging ends of the torse; it at all events made its appearance soon after the helm rendered the torse a desirable addition to the bascinet, and it may be seen upon the effigy of John of Eltham (died 1334) in Westminster Abbey.

The use of the shield heraldically seems to have been practically confined to Europe, and would seem to have been known before crests were common. Alexander the Great is said to have had a lion rampant on his; Tacitus refers to the devices on the German shields, and the shield of Magnus Barefoot (1093) bore a golden lion. As a decorative feature, the shape of the shield has not been treated in England with the variety and skill displayed by the Germans, but the increasing appreciation of heraldic design is leading to improvement. The illustrations exhibited by Mr. Crace were of high interest, especially several original drawings by Pugin and some by Mr. Ewe; and a very fine Spanish cloth of state embroidered with colours and metals in relief on a velvet ground, illustrated an application of heraldry rarely seen in England.

A reference was made during the discussion to the absence of all things female save the mermaid from heraldic representation, but it may be pointed out that the scaly lady does not hold quite such proud pre-eminence, as we have also the hind, the pelican-in-piety, female angels; and a representation of the Earl of Poole's arms, dated 1784, shows a "savage woman proper" as the sinister supporter, may be claimed that with the exception of the pelican these all appear as supporters only, and therefore, were used very little, if at all, in the days when heraldry had to fulfil its original purpose. Is it merely accidental that the Irish peerage shows a greater proportion of female supporters than the English or Scotch, or is it a true criterion of the natural gallantry of the people?

CONSTRUCTIONAL STEELWORK.

The following is the conclusion of the paper read by Mr. T. C. Cunningham at the meeting of the Architectural Association on the 25th inst., the first part of which was printed in our last issue:—

Continuing the subject of foundations for columns and stanchions, the lecturer referred to the building of some flats at Tunnell Park. In this case, he said, it was not considered advisable, from the nature of the site and the great expense, to take the walls down to the requisite depth for foundation. From a drawing it will be observed that in the positions shown, piers about 4 ft. square in Portland cement concrete were taken down to the solid strata, and upon these piers a framework of steel joists was built, properly fitted and connected together to carry the external and principal internal walls. By this method it will be inferred there is little or no possibility of any one part of the wall subsiding without affecting the general structure. The foundations, basement columns, &c., are here surrounded by constant moisture or the wet clay or earth itself. For such situations cement mortar should undoubtedly be used, as from experience it seems the best perfect conservator of metal work. A further recommendation of the use of cement is in the fact that the thermic expansion of Portland cement is practically the same as that of steel, a fact which ensures perfect cohesion under any changes of temperature.

It has been suggested to rely entirely on the preserving qualities of cement rather than upon a proper painting of the metal work. Professor Haussinger states that his experiments show a cohesion between steel and concrete after hardening of from 570 to 640 lbs. per square inch, which is more than the tensile strength of good concrete, but in building brick a perfect union between the cement mortar and metal work can never be attained at all points, and a thorough coating of paint is largely relied upon. All constructive steelwork should therefore be well coated with either lampblack mixed with oil, or red lead linseed oil, the very best of materials being employed. The oxide of iron or mineral paint which has generally been specified for all parts of the metal work has been found to separate from the steel and form an oxidation of the metal behind the paint. A mixture of red lead and linseed oil is now considered to be the best protective coating for iron or steel. Having regard to their importance in steel construction, we have dealt somewhat in detail with columns and stanchions, together with their foundations. We will now proceed to deal with girders, their connections, bearings, and the various forms of floors.

Girders.

In designing a building numerous cases occur where a single joist-girder will not be available, and it may be necessary to increase the length of the spans, so as to reduce the number of the supporting columns or stanchions to the minimum, or perhaps heavy, concentrated loads, such as columns, stanchions, brick chimneys, and stacks necessitate the introduction of plate and angle-riveted girders, or compound girders of joists and plates. Having calculated the loads on the several girders, it is an easy matter to determine the sections most suitable to the purpose. Frequently happens in designing a building that excessive loads are concentrated at two or more points of the floor, and in order to confine the construction within the limits of the design without increasing the sections where the minimum loads occur, recourse has to be had to various methods. The depth of the girder being reduced to the minimum order to obtain the required strength, the flanges of the girders must be unusually deep, the webs well stiffened or trussed. An illustration of this occurs in the ground floor of the West Australian Bank, Cornhill, also the ceiling of the news room of the Meredith Library.

Where the ends of the girders rest upon the wall it is advisable to use steel bearing-plates or joists to distribute the pressure over a larger surface, and thereby prevent the crushing of the material in the wall directly under the girder. In most cases a large tough stone will be sufficient, but where the pressure is heavy, both plates and stone should be used. The average pressure per square foot for brickwork should not exceed six tons, and for

stone, twelve to twenty tons, according to its character.

In calculating for loads upon girders where the bricks are laid regularly the probable line of rupture (providing the girder should fail) will be found to be inside of the sides of an isosceles triangle, whose base is the span, and whose height is one-third of the span. In order to be entirely upon the safe side, the weight of the wall between vertical lines directly over the girder for a height equal to that of the triangle, is frequently adopted as the load to be carried. However, it should be noted that for green walls, or walls having openings, this rule does not apply, as the full height of the wall between the points of support must be provided for. Where the width of the walls, supported by girders, either internal or external, exceeds 14 in. it is advisable to use compound girders, or plate girders, and where plate girders it is preferable to have them double webbed, or box girders, the latter giving greater stability than the single web girder.

In all built girders it is advisable that the flanges alone should be considered as resisting the bending moments, and both flanges nominally of the same section. No angles used smaller than 2½ in. by 2½ in. by ⅜ in. and no webs of less thickness than ¼ in. Stiffeners of tee or angle bars must be used where the depth of the girder is above a certain ratio in proportion to the web (say seventy times), and disposed so as to resist the shearing forces upon the web. In all cases it is absolutely necessary that they are provided at all bearings, and at points of concentrated loadings, and where straight stiffeners are used (they being preferable in girders for building work) the ends of them both top and bottom must fit closely against the flange angles in order to fulfil their proper functions. The safe loads for steel joists are given in the various merchants' catalogues, as also for compound girders made of joists and plates.

In designing compound girders, say of two joists, with plate top and bottom, take the safe load given for the two joists, making due allowance for the quantity of material taken from the flanges in the rivet holes, and the difference must be provided for in the sectional area of the plates. The distinct functions of the flanges and webs of all girders with thin, continuous webs are that the whole of the horizontal strains must be provided for in the flanges, the web practically taking no part in resisting them; neither are the horizontal flanges considered to take part in resisting the shearing forces, the whole of which must be provided for in the webs.

In selecting joists for girders, or similar purposes, the proportion of depth to length should not be less than one-twentieth of the span, otherwise deflection may take place. Due allowance must be made for all holes drilled in the joists for connexions, &c., more especially for such that are placed in the flanges. The depth of plate girders should be one-tenth to one-sixteenth of the span: the greatest economy of material is perhaps obtained at one-twelfth. For continuous girders or girders fixed at the ends the depth may vary from one-fifteenth to one-twentieth of the span. The width of the flange should not be less than one-thirtieth to one-fortieth of the span, and no plates should be less than ½ in. thick.

The general formula for plate girders of this class is $S = \frac{WL}{8D}$

S = Strain on top and bottom flange at centre in tons.

W = Weight distributed in tons.

L = Length of girder (or span) in feet.

D = Effective depth of girder in feet.

Steel may be strained to 7 tons per square inch in tension and compression, although some authorities limit it to 6 tons per square inch.

Floors.

Before considering the most economical arrangement of steelwork for floors, the question of loads, which very largely governs the design of the floor system, must be examined. The loads in building construction may be classified as dead, live, and eccentric loads. The principal loads affecting the floor systems are:—

Dead loads, comprising all of the static loads due to the constructive parts of a building; stationary machinery, water tanks, or other permanent loads.

Live loads, comprising the people in the

building, office furniture, movable stocks of goods, or varying loads of any character.

The maximum live load per square foot is usually assumed as follows:—

For Crowd of people.....	80 lb.
" Floors of houses.....	40 "
" Theatres and churches.....	80 "
" Ball-rooms or drill-halls.....	90 "
" Warehouses, &c.....	from 250 "
	[upwards.
" Factories.....	200 to 450 "

While 80 lb. is the maximum possible live load per square foot from a crowd of people (unless dancing be considered). Still, we can hardly expect to realise any such load under the conditions governing an office building.

Large crowds very seldom collect in offices, except on the lower floors devoted to stores, or banking purposes, and greater allowances are generally made for such places; the ordinary office furniture will certainly not exceed and seldom equal the weight allowed for persons, and hence additional security is introduced. These loads used in the calculations affecting the girders, columns, and stanchions, must not be confounded with the required loads for the strength of the individual floors, while the live load per foot super may be reduced over large areas in proportioning the girders and columns. The maximum possible live load must still be used when any single floor is considered by itself.

The practice in America seems to be pretty well defined in the matter of decrease of live loads per square foot, as they are transferred from beams to girders, from girders to columns, or stanchions, and thence down the columns to the footings. This practice is founded upon the supposition that it is quite possible that the beams may sometimes have to carry their full capacity in live loads, while the chances are increasingly less that the girders or columns will ever be required to carry anywhere near their full capacity if a full load had been assumed. The fully loaded area would probably never be large, and a girder or column would rarely, if ever, lie in the centre of such area. The effect of a live or moving load, causing vibration in the parts of a structure, is also gradually lessened, as the vibration, if any, is taken up in the transfer of the load from member to member, so that by the time it reaches the footings, or foundations, the live load is ignored entirely.

As examples of this system of calculation the following may be mentioned. In the Venetian Building in Chicago the beams were calculated for the following live loads:—

Upper floors, per foot super.....	35 lbs.
Second, third, and fourth floors, do.....	60 "
First floor, do.....	80 "

Girders carry 80 per cent., columns 50 per cent. of the loads. The weight of the steel girders, and brick or tile partitions are actually calculated for a typical floor plan, and then rated at so much per square foot of floor surface. The dead loads assumed in the old Colony Building, Chicago, comprised—

Flooring.....	4 lbs.
Deadening.....	18 "
Tile arches.....	35 "
Iron.....	10 "
Plaster.....	5 "
Partitions.....	18 "

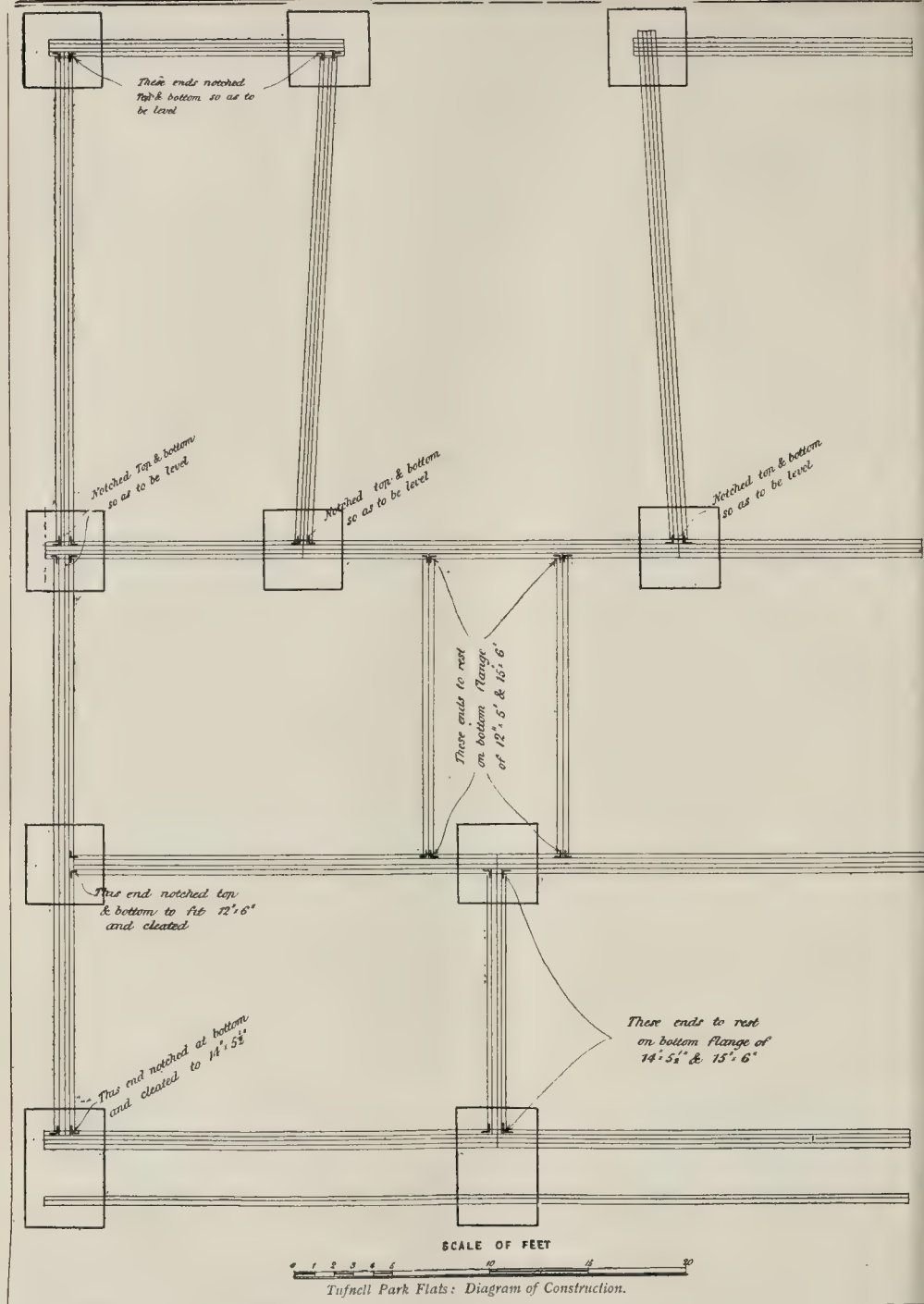
Total.....90 lbs. per foot super.

giving the following results:—

	Beams.	Girders.	Columns.	Footings.
Live loads...	70	50	40	—
Dead loads	90	90	90	90

Total ... 160 lbs. 140 lbs. 130 lbs. 90 lbs.

In the administrative block of the Royal Infirmary, Liverpool, which is five floors high, a similar system of calculation was adopted in regard to the strength for the lower columns and girders. In floors generally, one of the main points to be considered is that they must be firm and rigid, at the same time as light as possible, and subject to no vibration; to ensure this desideratum the joists must be of adequate depth. With the several systems of fireproof floors I do not now propose to deal in this paper, as the subject is so comprehensive that it is desirable to deal with it separately. The several examples shown of floor framing fully illustrate the way they are connected to the girders. Where they abut on girders they seat on angles which are riveted or bolted to



the webs, and in special cases the joists are angle cleated to the girders.

Steel Flooring.

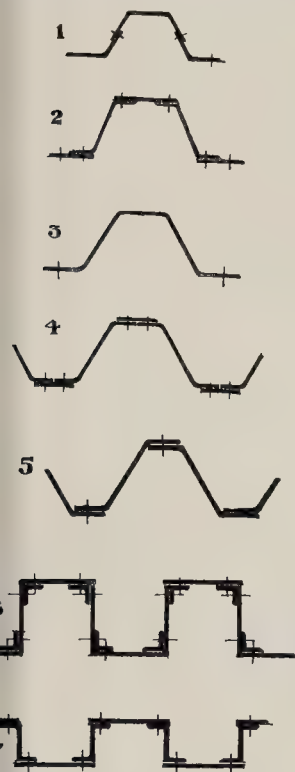
Each of the several systems of steel flooring has some special features. No. 1 is flooring made of steel trough-bars of various sections and weights per foot, from 4½ in. deep to 12 in. deep; the depth of the 12-in. section can be increased to 15½ in. deep by the addition of

bars. The sections up to 12 in. deep are rivetted together on the neutral axis, and the sections over 12 in. deep require two rows of rivets. This steel flooring is used in the floors of the National Liberal Club, Prudential Building, Holborn, Bishopsgate Goods Depot, and in a number of other buildings. Section No. 2 is rolled in depths 10 in., 12 in., 14 in. and 18 in. if required. In this section the rivetting is on the top and bottom flange. Section No. 3 is

either rolled or pressed in several depths and strengths, and is used as shown on illustration No. 4, with plain bar rivetted to both top and bottom, the edges of the troughs abutting. It is also used as shown on illustration No. 5, with the troughs lapping and one row of rivets top and bottom. Section No. 6 is a simple form of flooring, composed of plain plates and angle rivetted and connected as shown. It can be made any strength, depth, or span by increasing

sectional area of the plates and angles, or increased depth. It is nominally the same as the other section. Where the plates bear upon the walls, steel or iron bearings must be provided, and it is advisable to space these plates a little distance in from the face of the brickwork. These several classes of flooring can be fixed either upon the top or bottom flange of the girders or upon angle irons that are rivetted upon the webs of the girders, and bolted down as indicated upon the several illustrations.

The strengths of these floorings and loads supported at the various spans are each generally tabulated upon the sheets, which give very information. These floors are well adapted for warehouses, factories, mansions, public buildings, or in any situation where great and variable strains occur, either from the weight of heavy machinery, or from the weight of these steel floorings when bolted together is considerable, as each trough may be treated as a girder; as the whole is



Sections of Steel Floors.

bolted together no one portion can deflect without dragging down the adjoining troughs for the distance from the point of application of weight.

At this stage it would not be advisable to go into the question of the finishing of the floors, but consider it ought to be treated separately dealt with in a special paper. As before mentioned, that in order to render a building "proof" where steel construction is used, it is absolutely necessary that every member of construction must be thoroughly and adequately encased in some fire-resisting material, as to remove the metal from the direct action of the fire; and if this particular is attended upon, we shall not have such lamentable catastrophes that continually occur, more particularly in city buildings.

We have not now time to discuss the very important subject of roofs, as it is one that deserves to be treated also in a paper entirely of itself, from the fact of it being so comprehensive. However, several illustrations of various types of "roofs," with details of same, given on the various drawings. The one on the council chamber of the County Council

Buildings, Stafford, will illustrate the system adopted for fire-proofing a pitched roof of that class. The room is 42 ft. square, and the pitch of the roof is 51 degrees. The roofs, 28 ft. square of the same buildings, were also constructed in steel, with trussed purlins and lattice girders, so as to provide a level ceiling for the committee rooms below and for fire-proofing the roof of the same pitch throughout. The roof of the Town Hall of Oxford Municipal Buildings is an example of construction whereby the ceiling can be kept as high as desired, at the same time keeping the side walls down to the minimum. The same principle is also shown in the proposed detail of principals for the roof over the first-class swimming bath at Shoreditch Baths. The only further example that may be referred to is the gymnasium roof at Kingham Hill, which stands independently of the walls, part of them on plate girders, 40 ft. span, and the remainder on the usual stone templates.

Although the subject has been dealt with somewhat in detail, and examples of practical work have been given, most of them being works executed, a great many points in reference thereto have not been mentioned, more particularly independent structures, bracings, and questions analogous thereto; but having had the opportunity of laying the subject before you, I hope it may prove an incentive, and receive that attention which so important a subject demands in connexion with the practice of the architect.

The Chairman, in opening the discussion, said that the lecturer had succeeded in investing what appeared to be rather a dry subject with a large amount of interest. The reason, he supposed, why such a subject was more interesting to engineers than to architects was due to the fact that architects did not give sufficient study to the engineering construction of their buildings. It was very evident that engineering matters were not dealt with by architects as they should be. Architects were in the habit of placing the engineering work connected with their buildings in the hands of engineers, but he thought that an architect should study the engineering problems of his work a little more than he did—although he was afraid, unless they had a larger span of life given them and plenty of leisure, there was not sufficient time for the adequate study of such matters. At the same time, architects ought to understand the principles of engineering work, even though they might not have the opportunity of working out strains and stresses, and he thought that it would be well if less dependence were placed upon the engineer. Quite recently the Discussion Section of the Association held in that room a joint meeting with the Institution of Junior Engineers, when a discussion took place upon the desirability of a closer union between architects and engineers.* The general opinion of that meeting seemed to be that architects could not do without engineers, while engineers could not do without architects. At the rate that iron and steel construction had been going on during the last ten or twenty years, architects would soon be left behind by the engineers—if that were not an accomplished fact already. He hoped that some of the diagrams shown by the lecturer would be published in the professional papers, or otherwise a good deal of interest in the paper would be lost. From an example that the lecturer had sketched upon the blackboard, he, the speaker, thought it was a pity that engineers did not leave architecture alone when it was applied as a detail to any engineering construction. As architects they would be glad if such architectural forms as caps were omitted from iron construction, for it was very evident that it was not the proper treatment; and if engineers thought that engineering work could be made architectural by the application of architectural forms in the manner shown they were very much mistaken.

Mr. R. Moreland, in referring to the diagrams of the stanchions shown by the lecturer, said he would eliminate a great many of the forms from ordinary practice. In regard to fireproof construction, he thought that porous plaster was the best covering material, for it was more non-conducting.

Mr. R. J. Gifford Read said, in regard to the details of columns, he thought there were too many details shown. It was necessary for an engineer to know not only the theoretical forms which were necessary, but also the peculiarities of the trade—what could

be got and what made. A knowledge of this kind sometimes resulted in a considerable saving in cost. With regard to the foundations of columns, the method shown on the blackboard had been largely adopted in Chicago, the city being built upon a morass, on the top of which was a layer of hard clay, 10 ft. thick. It was desirable not to break through that upper crust, and the foundations of a building were spread out so as to give as little pressure per square foot as possible. The same thing had been done in St. James's-square, where the site consisted of a thin layer of clay, with sand underneath. The foundations of the new buildings had to be taken down on to the sand, the old surrounding houses being built on the clay, which was thick enough to support them. The lecturer seemed to think that oxide paint was not of much use, and he stated that he used lead. He (the speaker) thought lead was a good substance to use, but he had had a good deal of experience with oxide paints, and when he came to analyse them he found that there were very few that were genuine. If they got good ferric oxide, well ground, and treated with linseed oil, it would adhere to the steel, not scale off, and it would go twice as far as the ordinary oxide. He did not think the iron would rust unless the paint were porous. In regard to the relationship between engineering work and architecture, architects were in the habit of using materials which had been utilised for centuries. In designing in brick, or stone, or terra cotta, an architect frequently found difficulties in the execution of his work which were overcome by the use of iron or steel, as, for instance, where he had to carry the whole of his building over a shop, leaving the shop clear and perhaps a large open space behind. By making use of this modern material these difficulties could be overcome more easily and with less cost than if brick or stone were employed. He had heard architects condemn iron or steel construction, but surely it was of very great use to them in the erection of modern buildings if they used the material properly; it enabled them to span over large spaces, and it might be covered with terra cotta or plaster in a satisfactory manner, and it gave a strength not otherwise obtained. Iron or steel could not only be employed to assist in the construction of ordinary buildings, but it might also be legitimately employed as a decorative material, viz.: in roofs where it need not be out of harmony with the architecture. It was necessary for the engineer to learn something of architecture—more necessary perhaps than for the architect to study the dry scientific formulæ of the engineer.

Mr. B. F. Fletcher, in proposing a vote of thanks to the lecturer for the paper and for his admirable collection of materials and diagrams, said it was a subject of interest to architects, and especially to any one who had seen any of the exhibition building at Chicago or Paris. In regard to columns, which were not an iron feature at all, it would be better to employ stanchions instead, for that was a legitimate method of treatment in iron or steel. In this way, such abominations as Corinthian columns in iron could be avoided. The object of the engineer or architect should be to take the material for what it was worth, and if a simple form like a stanchion were used, they had something which was beautiful in itself. The roofs and galleries at the Paris Exhibition showed into what beautiful shapes stanchions could be made. He would like to know from the lecturer how the price of drawn steel worked out as compared with cast-iron? He got an estimate recently for some drawn steel work, but in consequence of the cost he had to make use of cast-iron. He would also like to ask if there were any objection to laying stanchions on stone beds without any fastenings whatever? This was done on a large building which he had seen lately, where the stanchion was laid on to the stone bed without any fastening, and tied on to the girder on each floor. In regard to fireproofing, they could not think much of a material that had to be covered up as iron needed to be, in some respects, and he did not think that engineers had much reason to congratulate themselves in regard to iron; it was a material which could not be exposed anywhere in a building that was to be fireproof, except in station roofs and exhibition buildings. That was the great drawback to its use in buildings of any architectural pretensions, because it was practically thrown away, and had to be plastered over. He did not understand the calculations of the lecturer in

* See the Builder for March 19, p. 253.

regard to foundations. When he, the speaker, was in Chicago he came to the conclusion that the American engineers did more or less what they liked, and he never could find an engineer who could satisfactorily explain the matter to him. In the *Daily Mail* offices on the Embankment the same difficulty as to soil had been met with. In regard to the formula shown upon the board by the lecturer, he, the speaker, hoped that a new formula was not about to be introduced. The formula which architects had learnt was *C ad*.

Then, as to floors, and the difference between the American and the English practice. The lecturer had given them the ordinary Chicago practice of calculating for 80 lbs. per foot; but this was never done in England, where the weight would be never less than 1 cwt. per foot, and in the floor of a large building it would be from $1\frac{1}{2}$ to 2 cwt. per foot. Architects were more or less advised by engineers in these matters, and he did not think that any English engineer would allow 80 lbs. per foot in a public building. In regard to the trough flooring, he had heard that it was not a success at the National Liberal Club. He would like to know more as to steel work. In designing steel floors, no notice was taken, apparently, of concrete, which must be of some use and some strength to the joists. The subject of roofs was of great importance to architects; it was astonishing what could be done with steel roofs having no ties, and he might mention the steel roofs which had been used at the Northampton Institute and Battersea Town Hall, which had very large spans and had no ties. In his opinion the development of steel in that direction was going to affect architecture. As to the relationship between architects and engineers, he thought that a great deal of work was undertaken by engineers which was legitimately architectural work, and he thought the designing of a steel bridge was properly architectural work. Of course he did not mean to say that the help of the engineer was not very necessary to the architect, but since engineers did not study form or beauty they should not be entrusted to erect buildings which might last for centuries.

Mr. C. H. Brodie briefly seconded the vote of thanks.

Mr. Mark Fawcett said that the lecturer mentioned the case of a column 7 in. in diameter and 14 ft. high, the safe working stress of which was 92 tons. He, the speaker, had been looking into that, and he found that, assuming the steel to be 30-ton steel—that was, capable of resisting a crushing load of 30 tons to the square inch—they got a crippling resistance of 18 tons to the square inch. The sectional area worked out at 20½ in., and if the safe load were 92 tons, then the factor of safety was about 4½; that would give, assuming that the crippling resistance was 18 tons to the square inch, a test load that would do no harm. The lecturer seemed to think that it was remarkable that the steel column that he referred to stood a stress of 180 tons, but in his, the speaker's, opinion, it was not at all remarkable, as the column had not anything like its breaking stress upon it. In speaking of eccentric loading, he understood Mr. Cunningham to mean that loading was eccentric unless it was equally distributed or central. In regard to the diameters of columns and their carrying capacity, he thought that they all knew that a column of equal sectional area would carry more if the diameter were increased, and they could easily ascertain what loads it would carry.

The vote of thanks having been put and carried unanimously,

Mr. Cunningham, in the course of a brief reply, said that in reference to the cast-iron caps, engineers did not profess to design them; they left that to the architects, but it frequently happened that they had to use cast-iron finishings for steel stanchions and steel girders, &c. In reference to the 7 in. column referred to by Mr. Fawcett, the safe load was nominally 90 tons, and it was tested up to half its breaking power. The great desire of engineers and architects was to work together in unison in engineering matters. The architect could not get away from the engineer nor the engineer from the architect. He had been a member of the Association for over twenty years, and it had given him great pleasure to come before them that evening.

The Chairman announced that the next meeting would be held on April 22, when Mr.

H. B. Creswell would read a paper on the "Morality and Economy of Competitions."

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the Council was held on Tuesday in the County Hall, Spring-gardens, Mr. T. McKinnon Wood (Chairman) presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Islington Vestry 13,600l. for electric lighting, and 11,350l. for paving works, and 2,000l. towards the cost of purchasing Churchyard Bottom Wood, and the Wandsworth District Board 5,000l. for paving.

Fire Brigade Tenders.—The Fire Brigade Committee recommended that Mr. Kearley's tender, at 4,895l., be accepted for the enlargement and alteration of the Battersea fire station; that none of the tenders be accepted for similar work at Hampstead, the work to be given to the Works Department; and, further, that none of the tenders for the erection of the superstructure of the Battersea river station be accepted, the same procedure to be adopted as in the last case and the work sent to the Works Department.

Mr. Boulnois, M.P., said it seemed that this Progressive Council was going to entirely alter the proceedings of the previous Council—to proceed on other lines than those laid down by the Moderates. No respectable contractor would take the trouble to go through the specifications and tender after the treatment they were receiving that day at the hands of the Council. He desired to raise his voice against this treatment of the contractors. It would be more honest if they were to say they would have nothing to do with contractors—that everything should go to the Works Department.

Mr. Burns, M.P., said from Mr. Boulnois' speech people would think that it was proposed to give the work to the Department although a contractor had offered to do it for a smaller amount. As a fact the Department's estimates were less than the lowest tenders. It was said that no decent contractor would tender for the Council's work, and it looked very much like it. In another case which would come before them directly one of the tenders was 55,000l. above the Engineer's estimate, and doubtless Mr. Boulnois would cheerfully vote for that contractor having the work. It was to stop that sort of thing this Council was elected. He was glad to know there was now a Progressive Council which could not be pulled up by water companies or contractors.

The recommendation was then agreed to.

Additions to Engine House, Crossness Outfall.—The Marine Drainage Committee recommended, and it was agreed, that the estimate submitted to the Council by the Finance Committee be approved, and that an expenditure of 6,000l. be sanctioned by the Council in respect of the cost of erecting the superstructure of the addition to the engine-house at the Crossness Outfall, together with that of providing an overhead traveller.

Cripplegate Improvements.—The Improvements Committee reported that the City Corporation asked for a contribution from the Council towards the cost of the proposed improvements in Cripplegate, consequent upon the great fire. Two schemes had been laid before the Committee, one by the City authorities and the other by the Council's Engineer. The recommendation of the Committee was that, in the opinion of the Council, none of the schemes suggested for improvements in Cripplegate would, if carried out, prove to be of such general advantage to the through traffic in London as to justify the Council in contributing any part of the cost.

Sir J. Dimsdale moved, as an amendment, to add to the recommendation:—"But are prepared to discuss any proposal which in the opinion of the Council would lessen the danger of fire, and improve the through traffic of the Metropolis from east to west."

Mr. Shaw-Lefevre, Chairman of the Improvements Committee, said they had no objection to receiving further proposals from the Corporation. He would, therefore, accept the amendment.

After some further discussion the amendment was rejected by 56 votes to 46.

The Committee's recommendation was then adopted.

Enlargement of North Central Weights and Measures Office, Clerkenwell.—The Public Control Committee reported as follows, the recommendation being agreed to:—"The property has now been acquired for the enlargement of the North Central Weights and Measures Office at Clerkenwell, and the Architect has prepared plans for the building at an estimated cost of 3,050l. The estimate of the Manager of the Works Department for carrying out the work is 4,124l. To obtain tenders will involve del some considerable expense, and may very probably result in disappointment. Under the circumstances we are of opinion that the work should be entrusted to the Works Department. We do not anticipate that the amount (7,700l.) voted by the Council for the acquisition of the site and enlargement of the office will be exceeded. We recommend—That the work of the enlargement of the North Central Weights and Measures Office be executed by the Council without the intervention of a contractor, and that the plans, specification, quantities, an estimate of 4,124l. be referred to the Works Manager for that purpose."

Foundations, Bexley Heath Asylum.—Colonel Rotton, on the report of the Asylums Committee asking the Council to approve the excess of 7,023l. over the final cost of the foundation of the Heath Asylum at Bexley, pointed out that the matter was a serious one, because it involved a dispute between two officials—the architect, Mr. Hine, and the Works manager, Mr. Adams. The money, of course, had to be paid out of the ratepayers' pocket, but if a contractor had taken the work he would have had to pay the excess out of his own pocket.

Lord Dunraven said the matter was very important, and further information was necessary.

The report was adopted without further comment.

Greenwich Tunnel Works.—The Bridge Committee reported that two tenders were received in February for this work—viz., from Messrs. Mowlem & Co., amounting to 110,732l. 10s. 4d., and from Messrs. Pearson & Son, amounting to 155,000l. When the Committee first reported on the question of the formation of the Greenwich Tunnel, they stated, on the advice of the Engineer, that the total estimated cost of the works amounted to 65,000l., and that the cost of acquiring the land for the purposes of the scheme was 5,500l. When, however, the Bill was before Parliament, the Committee inserted clauses to meet the claims of those persons whose ferry rights were liable to be affected by the tunnel as well as those whose interests will be injured by the scheme. To meet these claims the Council will be recommended by the Finance Committee to include in one of its bills for this year a sum of 30,000l. in regard to the sum that should be fixed to meet the increased cost of the works, the Engineer advises that although his amended estimate is 83,175l. 3s. 6d., as against his first estimate of 65,000l., he thinks an additional sum of 55,000l. should be added to the latter sum, making a total estimated cost of the works 120,000l. The revised figures of the estimated cost of forming the Greenwich Tunnel are therefore as follows:—Works, 120,000l.; land, 5,500l.; compensations, 30,000l.; total, 155,500l. The Committee recommended (a) that the Council do suspend standing order No. 32 in reference to recommendations of Committee involving capital expenditure exceeding 5,000l. (b) That the Parliamentary Committee be instructed to take the necessary steps for inserting a clause in the Council's General Powers Bill, 1898, authorising the Council to expend a further sum of 55,000l. on the works to be carried out in connexion with the formation of the Greenwich Tunnel.

This was agreed to, with an addition, that in view of the great increase of cost involved the Council reserves to itself the right to reconsider the whole question before any tender is accepted.

Removal of Vauxhall Bridge.—It was agreed to invite tenders for the pulling down and removal of the existing bridge at Vauxhall.

District Surveyor for Fulham.—The Building Act Committee reported as follows:—

"The Council decided on February 22 last, on consideration of a report submitted by us relative to the conduct of Mr. Andrew Moseley in his capacity of District Surveyor for Fulham, to dismiss him from his office, and to request the consent of the Secretary of State, as required by Section 139 (1) of the London Building Act, 1894, to such dismissal. Mr. Moseley having held his office before August

885. The Council suspended Mr. Moseley, as from February 22, until the matter of the dismissal should be determined; and appointed Mr. S. F. Clarkson, District Surveyor for North Chelsea, a temporary substitute to act as District Surveyor for Fulham during the absence of the Council. We have now to report that letter, dated March 23, 1898, has been received from the Home Office, conveying the consent of the Secretary of State to the dismissal of Mr. Moseley, who is, therefore, no longer the District Surveyor for Fulham. We have under consideration the question upon which we will report in due course, of what permanent arrangement should be made for the proper supervision of the district; and in the meantime the order of the Council appointing Mr. Clarkson as a temporary substitute in charge of the district will continue in force until the Council shall make a further order upon the matter.

Fire Brigade Tenders.—On the recommendation of the Fire Brigade Committee it was agreed that the supplemental estimate of £600, to be submitted by the Finance Committee in respect of the erection of a fire-engine station at Lewisham be approved; that the tender of Messrs. Holloway Brothers to erect for £13,600, a fire-engine station at Lewisham be accepted; that the estimate of £3,282, to be submitted by the Finance Committee in respect of the erection of a sub-station at North Woolwich be approved; that the tender of Mr. E. Rector to erect for £3,182, a sub-station at North Woolwich be accepted. The Council, after transacting other business, adjourned for the Easter recess.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION: ANNUAL DINNER.

The twentieth annual dinner of this Institution was held at the King's Hall, Holborn restaurant, on Tuesday evening. The chair was occupied by the President of the Institution, Mr. R. C. Foster.

After the loyal and patriotic toasts had been pronounced,

The President submitted the toast of the evening, "The Builders' Clerks' Benevolent Institution." He remarked that the Institution was founded in 1866, and during those thirty-two years had pursued the even tenor of its way without performing any very great feat to bring it before the general public. It was founded in a way most consistent with the traditions of Englishmen—it was based upon the principle of self-help. Two or three gentlemen felt that the interests of their unfortunate brethren had not been sufficiently provided for, and thereupon set on foot an institution to grant pensions and relief to decayed clerks, their widows, and to make provision for their orphans. That the functions of the Institution had been properly carried it would be made clear when he told them that up to the end of 1897 it had been instrumental in paying out in pensions and temporary relief no less than £7,228. Besides this, they had paid to the Gresham School, 789l. Mr. He must express his indebtedness to those kind friends connected with the building trade who had sent such unselfish donations to the worthy objects of the Institution. He had made a calculation, and found that no less than 188, out of every sovereign subscribed was available for the purposes of the Institution.

The quantity surveyor remarked, in sending in a substantial donation, that that did not represent a tithe of the obligations which he felt was due from him and his profession to the builders' clerks. "I feel," he continued, "indebted to them for a very large amount of the technical instruction and information which I have gained in my career." He (the Chairman) must also confess his own obligations to the builders' clerks. For what technical knowledge he possessed he was, in a great measure, indebted to the builder's clerk and the builder's foreman. From the contractors' point of view there was no class of men more deserving than the builder's clerk. In the first place they were men who, in the nature of things, must be competent, hard-working, and clear-headed. The practical nature of their training accounted for the fact that there were so many successful and eminent contractors who had served as builders' clerks. They knew, also, that in London many of their most competent and successful quantity surveyors rose from that position. As a class, builder's clerks were always willing and ready; they were content to exist without

a union, nor did they seek to bind, hamper, or harass their employers by trades-union methods.

Mr. J. Howell Williams then proposed the toast of "The Architects and Surveyors." He repudiated the slur Sir William Harcourt cast upon the architectural profession recently when the right hon. gentleman quoted, ostensibly to their disadvantage, the words of Byron, "The most recent is the least decent." He was convinced that if the Government, in spending the 2,500,000l. which they now had at their disposal for new public buildings, would only give the architects of to-day a fair opportunity, they (the architects) would be able to produce something that would falsify the meaning to which Sir W. Harcourt put the lines of Byron. There would be produced work worthy of the genius they had in the architectural profession to-day. At the same time, when they came to reflect, they could not help recognising how very difficult was the position of the architect. He combined in his qualifications not only art, but science, and owing to the introduction of steel he had further to combine with art and science a knowledge of engineering. But, after all, the architect's duty was to overcome difficulties, and to his credit he invariably did so.

Mr. E. T. Hall responded to the toast. Assembling as they did in the beautiful King's Hall, he would have been glad to have heard the toast responded to by their distinguished guest, Mr. T. E. Colcutt, who was not only responsible for the design of the building in which they were dining, but many others of equal merit and beauty. Architecture bore the same relation to building that the flesh and the soul bore to the skeleton of the human frame—it provided vitality to the dry bones of construction. As to the future of the profession, he was pleased to be in the position to be able to congratulate them that there were signs of abundance of work. Apart from the extensive scheme of public buildings foreshadowed by the Government, numerous public bodies in the kingdom contemplated buildings of a character which would, to use a familiar phrase, bring grist to the mill. It was gratifying to note that not only on the part of public bodies was there a growing appreciation of architecture, but also on the part of private individuals who now desired, much more than formerly, to aspire to the beautiful in architecture, even in their residential buildings. They were very often reminded of the beauties of Italian and French architecture—and beautiful both were, certainly—but they had no cause to be ashamed of the specimens of architecture in this country. To his mind there was no building in the world of its class and character that could be called superior to St. Paul's Cathedral, nor was there a tower or spire in the world better than that attached to Bow Church, in Cheshire.

Mr. F. S. Oldham (Perry & Co., of Bow) proposed "The Builders," and expressed gratification that provincial builders were now extending more help than formerly to the funds of the Institution.

Mr. J. Howard Colls acknowledged the toast. He reminded them that builders' clerks, by the very nature of their work, had to take the keenest interest in their employers' undertakings. They were not engaged in buying and selling things which were here to-day and gone to-morrow, but in arranging and perfecting schemes which had to stand the test of time.

"The Merchants" was given by Mr. E. B. Gammon and acknowledged by Mr. Alsop; "the President," by Mr. Leonard J. Matom, and "the Past Presidents" by Mr. H. W. Parker.

The Chairman announced during the evening that 480l. had been subscribed by the guests towards the funds of the Institution. Among the largest subscribers were the Institute of Builders, English Bros. (Wisbech), J. Mowlem & Co., G. Farmiloe & Sons, and Joseph Randall, ten guineas each; Carpenter & Co., Eastwood & Co., W. Oliver & Sons, Nobles & Hoare, Slater, Birds, & Co., T. M. Rickman, B. J. Hudson & Sons, T. Lampard Green, Dent & Hellyear, five guineas each.

"THE STUDENT'S COLUMN."—Owing to the pressure of other matter, we are compelled to hold over until next week our usual "Student's Column" article ("The Calculation of Strength of Materials and Resistances"). Two chapters will be given in our next issue.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Fulham.—Buildings on the sites of Nos. 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, and 41, Harwood-road, and also on the site of stabling at the south end of that road, at the corner of Moore-park-road. (Mr. F. Matcham for Sir J. Johnson).—Consent.

Kensington, South.—Buildings, with one-story shops in front, on the south side of Old Brompton-road between No. 38, Sussex-place and No. 12, Summer-place. (Mr. W. H. Colbrann).—Consent.

Bermondsey.—A staircase block at Snowfields school on the east side of Kirby-street (Mr. T. J. Bailey for the School Board for London).—Consent.

Width of Way.

Lambeth, North.—Two two-story bay windows in front of proposed new offices at No. 47, Belvedere-road, Westminster Bridge-road (Mr. E. T. Hall for Messrs. Eastwood & Co.).—Consent.

Line of Fronts and Width of Way.

Peckham.—A building on the north side of Elm-grove, Rye-lane (Mr. P. Moses for Mr. S. Sayer).—Consent.

Artizans' Dwellings.

Paddington, North.—That the Council do, in the exercise of its powers under Section 42 of the London Building Act, 1894, disapprove and refuse to sanction the plans, dated March 15, 1898, delivered by Mr. H. Gundry for Mr. H. Ward, of a building not abutting upon a street, and adapted to be inhabited by persons of the working class, such building being shown to have stabling on the ground floor at the rear of Nos. 417, 419, and 421, Edgware-road, and an entrance through the ground floor of No. 118, Hall-place.—Agreed.

Means of Escape at Top of High Buildings.

Westminster.—That the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, do grant a certificate in respect of the means of escape, in case of fire, proposed to be provided for the persons dwelling or employed in the two topmost stories of the Institution of Mechanical Engineers, Storey's-gate, Birdcage-walk (Mr. A. Bache, for the Institution).—Agreed.

COMPETITIONS.

FYLDE WORKHOUSE, KIRKHAM, LANCASHIRE.

—At a meeting of the Fylde Board of Guardians at Kirkham recently, the question of appointing an architect to carry out the building of the new workhouse was discussed, and it was decided to entrust the work to Messrs. Haywood & Harrison, of Accrington, whose designs were placed second in the recent competition. The new workhouse will accommodate 300 inmates, and in addition to the ward pavilions for all classes, a large infirmary will be provided, and an isolation hospital for infectious cases. In his award, the assessor (Mr. Kirby, of Liverpool) placed first the plans of Messrs. Crickmay & Sons, London.

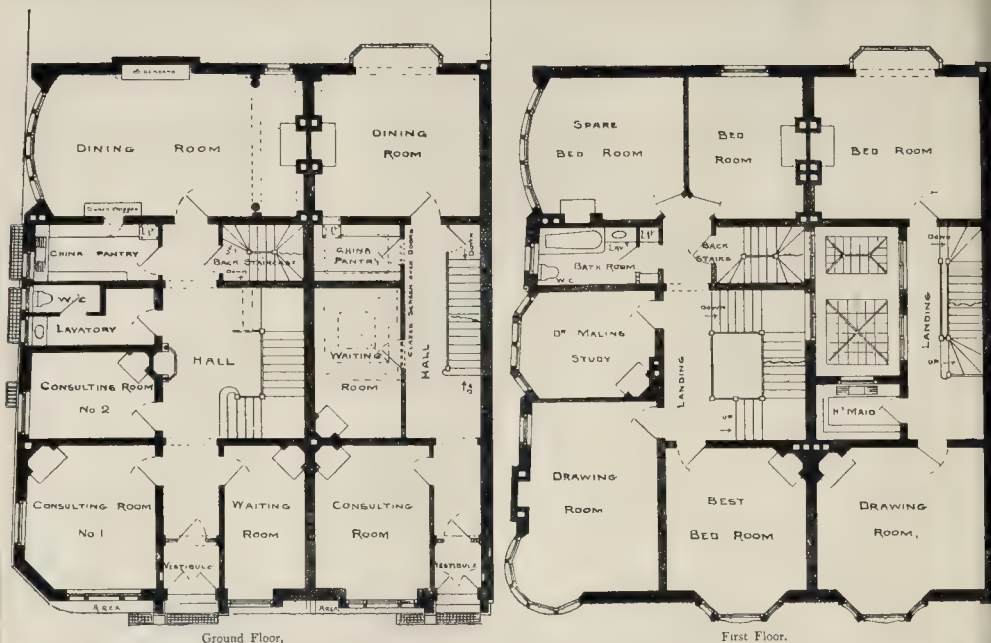
ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.

—The members of the Edinburgh Architectural Association visited the Museum of Science and Art on the 26th ult., by permission of Sir R. Murdoch Smith. The Curator, Mr. D. J. Vallance, who conducted the party, gave a general description of the building, the dates and methods of its construction, the precautions taken against fire, the heating arrangements, and the workshops. At the conclusion of the visit, Mr. Thomas Ross, President, in moving a vote of thanks to Mr. Vallance, said he hoped full advantage would be taken by students of the fine scientific and artistic collection.

RESTORATION OF THE CHURCHYARD CROSS, MELBURY BUBB, DORSETSHIRE.—The Churchyard Cross at Melbury Bubb has been restored. The shaft had disappeared, and all that remained was the ancient base, decayed and rotten. The whole of the restored cross is of stone from the quarries at Portland, and the work has been carried out by Messrs. Harry Hems & Sons, of Exeter.

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.



Ground Floor.

First Floor.

Doctors' Residences, Birmingham. Plans.

Illustrations.

STATUES AT THE ROMAN BATH, BATH.

THE eight statues illustrated here, the work of Mr. G. A. Lawson, are set up on the pedestals of the balustrade above the colonnade with which Mr. Brydon has surrounded the Roman bath at Bath. As stated on the lithograph, the statues are all to the same scale, but those at the side of the bath, owing to difficulty of access, could only be photographed to a small scale, and we have preferred to keep the others to the larger scale rather than reduce them to match, on paper, the side statues.

The statues stand round three sides of the bath; two of those given on the large scale being at one end, the other two at the opposite end, while the chronological sequence is kept up by the group of side statues; the whole series commencing with the statue of Caesar and ending with that of Constantine. The others represent emperors or generals who were engaged in the conquest and occupation of Britain under the Romans, viz., Claudius, Vespasian, Ostorius Scapula (general), Suetonius Paulinus (general), Agricola (general), and Hadrian.

The re-entering angles of the balustrade are emphasised by terminal figures planted at an angle of 45 deg. with the axial line of the structure.

DESIGN FOR A SUBURBAN CHURCH.

This design was submitted for a proposed new church in a London suburb.

The neighbourhood is not a wealthy one, though there are many well-to-do families and retired tradesmen in its midst. The present church is a small and extremely inconvenient building, and a chapel of ease to the parish church. It was proposed, however, to make an independent parish and to erect a large church, the number of residents having increased greatly of late years.

The plan shows accommodation for about 900 worshippers, with a morning chapel, vestries, and a choir-practice room under the vestries.

The chancel apse is lighted by tall windows, recessed in an arcade inside, which imparts dignity and grace to the vista inside. These windows are carried on, on both sides of the nave, as a high clearstory.

The baptistry (in the tower) is raised a little above the floor of the church, in order to be well in view of the congregation.

An approximate estimate for the building amounted to between 10,000l. and 12,000l., but the drawings being incomplete, there were not sufficient data for an accurate estimate.

E. B. LAMB.

DOCTORS' RESIDENCES, BIRMINGHAM.

THIS block of building, consisting of a pair of doctors' residences, is situated at the junction of Newhall-street and Cornwall-street, Birmingham, the corner one being occupied by Dr. Malins, for whom the buildings have been erected. The ground floors are devoted principally to consulting and waiting rooms, with dining-rooms in the rear, and serving and lift rooms adjoining. The first floors contain the drawing-room, studies, &c. The elevations have been carried out with red brick facings and buff terra-cotta dressings. The architects are Messrs. Essex, Nicol, & Goodman, of Birmingham; and the builders Messrs. Thos. Lowe & Sons, of Burton-on-Trent.

THE LLEWELLYN ALMSHOUSES, NEATH.

THESE almshouses have been erected by Mrs. Llewellyn, of Baglan Hall, Glamorgan, to accommodate eight inmates; each having a separate house. There is also a common room, or kitchen, with a washhouse adjoining, together with the caretaker's sitting-room and bedroom on the first-floor. Each house comprises a sitting-room with its ingle nook, bed alcove, and small scullery. The rooms are oak-panelled throughout; the rafters and boarded ceilings are of the same material, which is used for all internal fittings. The whole of the external woodwork is of teak. The houses are built of Ruabon bricks, with red Carlisle stone dressings. The roofs are covered with Ruabon tiles.

The work has been carried out from the designs and under the direction of Mr. George E. Halliday, architect, of Cardiff.

GROVE HOUSE, CHISWICK.

THE historical property known as "Grove House, Chiswick," has lately been purchased from the Duke of Devonshire by Colonel Shipway, who has spared no expense to restore

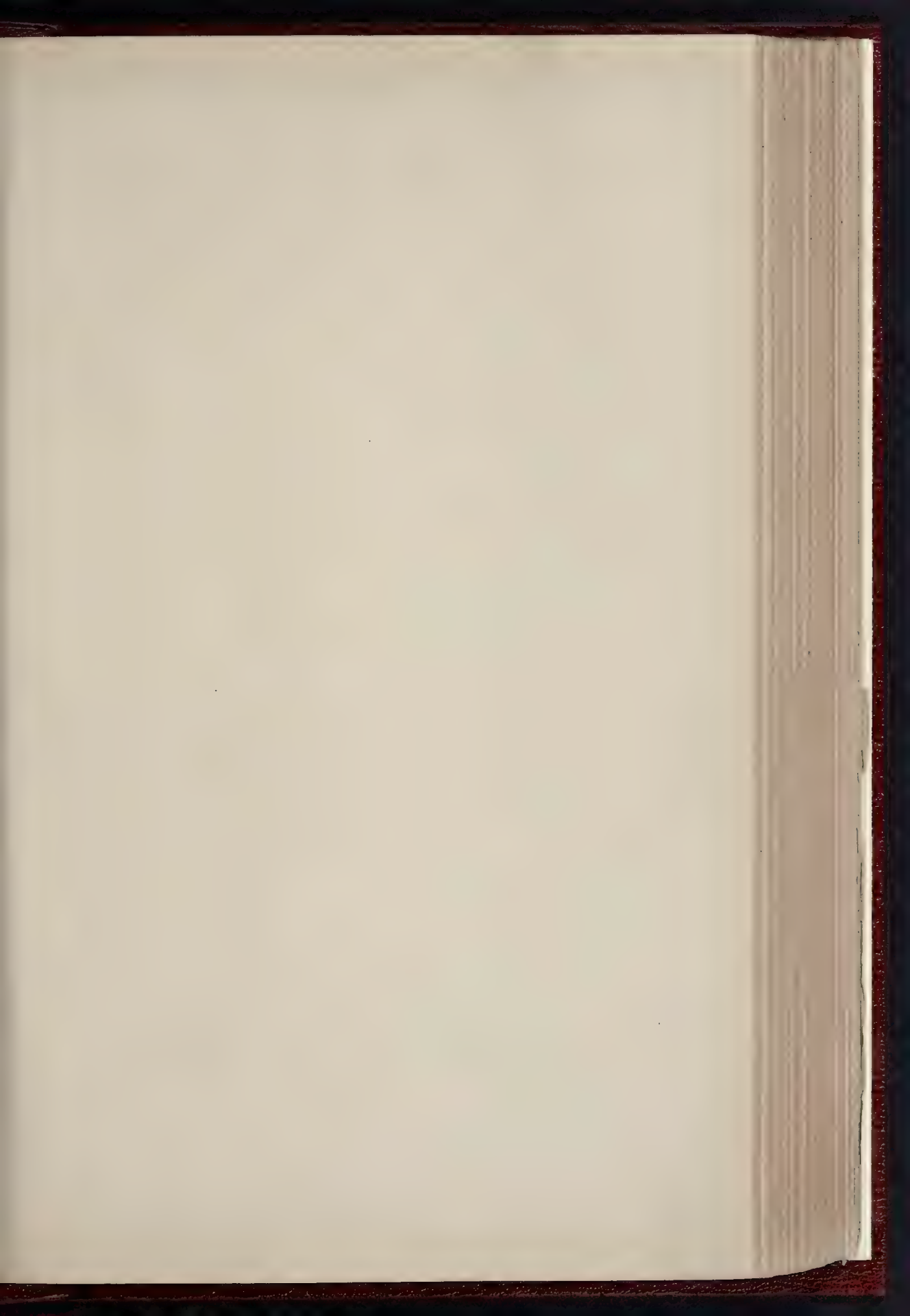
the house to something like its ancient splendour.

The Grove House Estate belonged, from Henry IV., to one Robert Warner, and the for many generations to the Barker family. On the death, in 1745, of Henry Barker, it was purchased by the Earl of Grantham, or Ambassador to Spain in 1771, who laid out the once beautiful grounds and garden. He died in 1786, and the property passed to his daughter, Frances, after whose death it was bought by Humphrey Morrice, who added to the house and built a riding-house. Morrice bequeathed it, 1790, to Mrs. Luther; she sold it to the Rev. Robert Lowth, from whom it was acquired by William, sixth Duke of Devonshire. In Faulkner's "Chiswick," 1845, is a woodcut of the house by F. H. Wilson, which shows it having two wings, of three floors and a basement, between which is a tetrastyle portico with Ionic columns and angle-pediment. In 1846, Edward Walford, in his "Greater London," says that the Duke of Devonshire removed the top story of the house. The grounds, about 80 acres in extent, have lately been laid out for villa residences, and we believe that Messrs. Palgrave & Co. were retained as architects and surveyors for the work. Morrice's collection of pictures was bought by John, second Earl of Ashburnham.

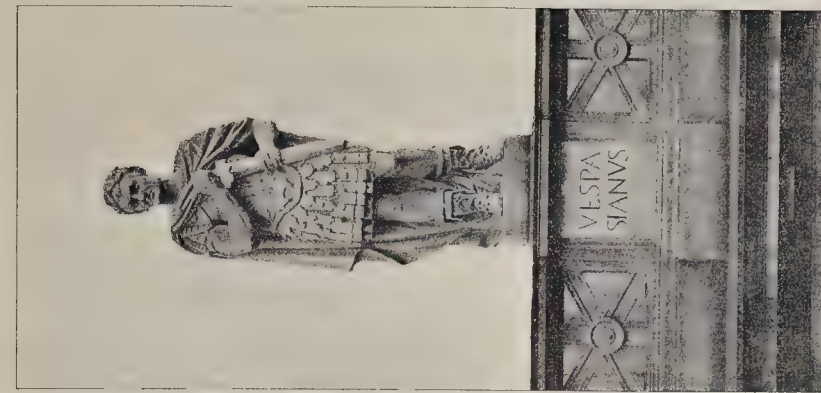
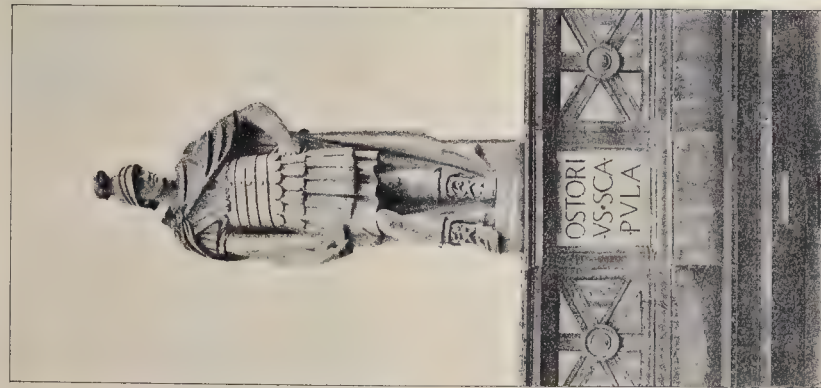
The photographs which we reproduce give a view of the front of the house with its portico and the interior of the dining-room, which is one of the most effective rooms in the house and the only one in which the old decorations remain intact.

In the drawing-room a great deal of new work has had to be done. This was at one time panelled in oak, but none of the old decorations remain except the ceiling and cornice, and the chimney-piece, the entablature of which is supported by jambs with caryatides. This room has been lavishly decorated in Louis XIV. style, and panelled in blue and gold, specially copied in design and colour from a Louis Seize brocade, and woven by Messrs. Warner, of Spitalfields. The decorative work to the walls being carried out by Messrs. G. A. Brown, of Newman-street.

The entrance hall of the house has been enlarged and improved by the insertion of fireplace, with oak chimney-piece, and ornamented after the Flemish school with Dutch tiles in the panels. The oak dado which surrounds the hall formed part of the reproduction of the old burgomaster's house.





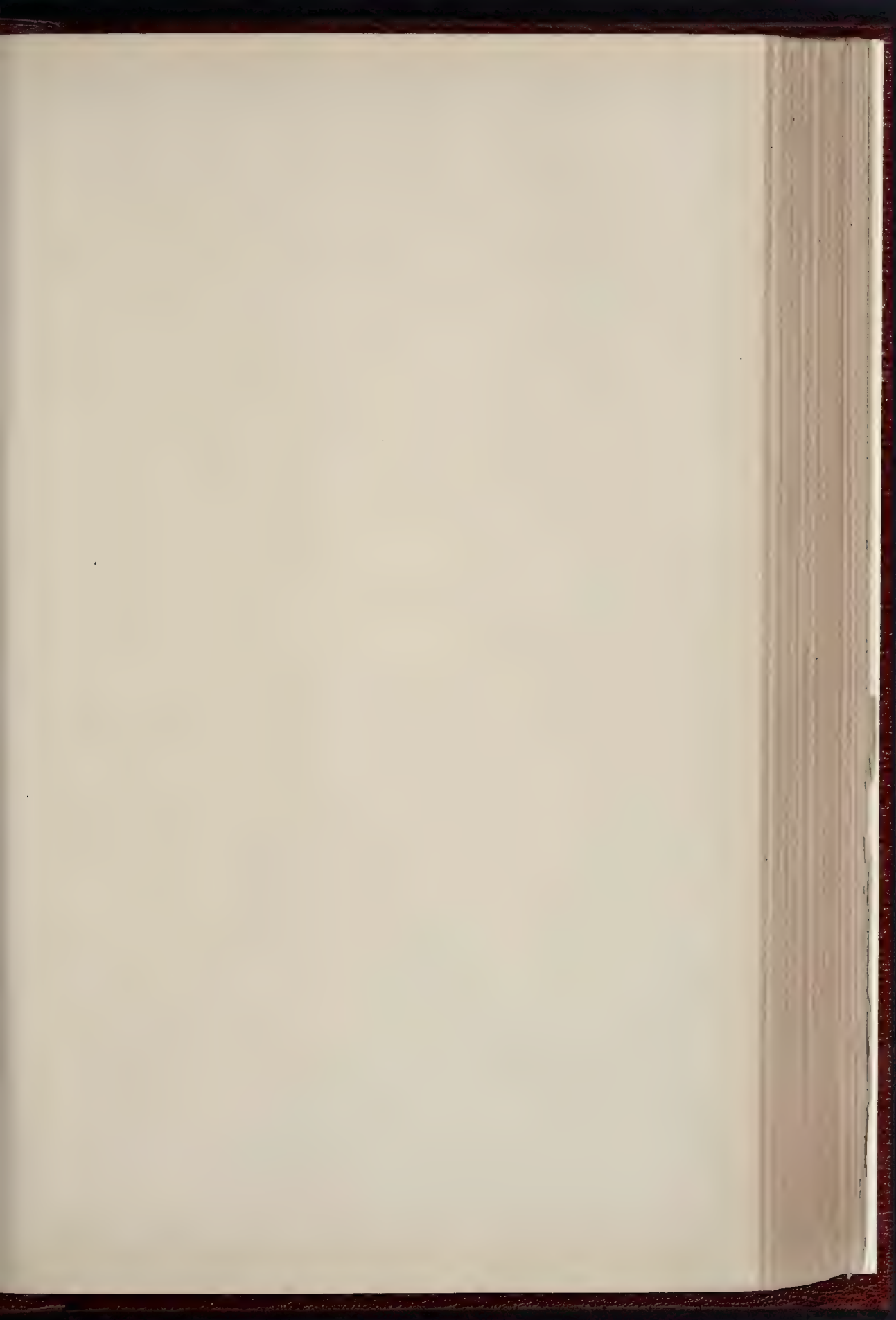


STATUES AT THE SIDE OF THE BATH.

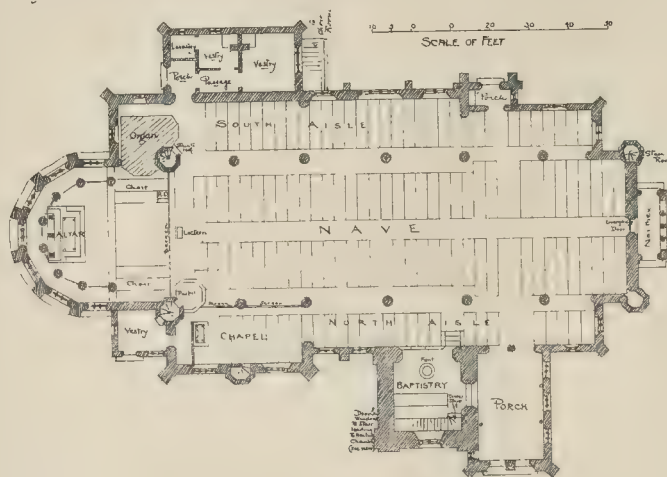
N.B.—The eight statues are all on the same scale, but owing to difficulty of access those at the side could only be photographed on a small scale.

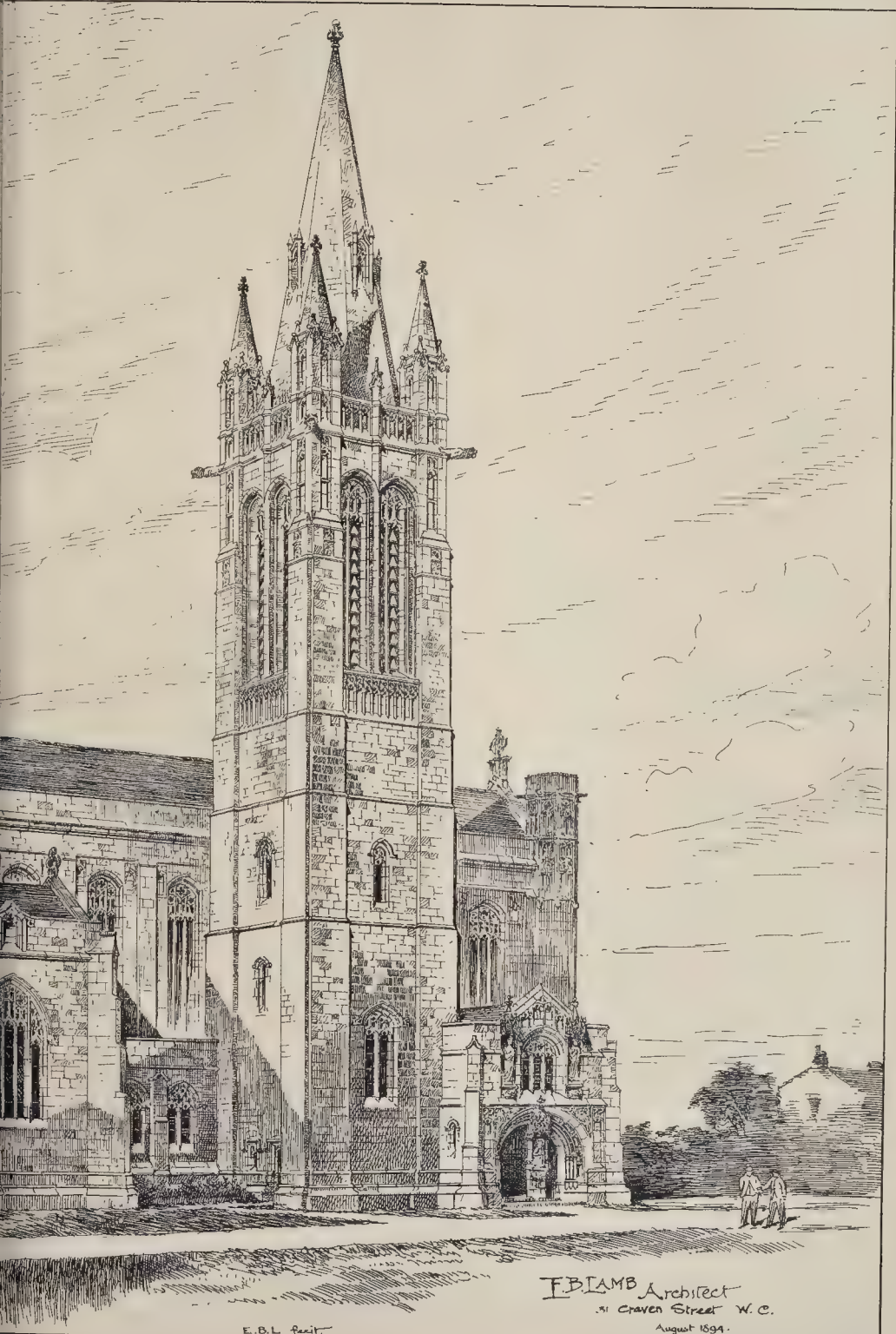
1/4 PHOTO. BRASO. P.A. 1/2. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

STATUES ERECTED ABOVE THE ROMAN BATH AT BATH. MR. G. A. LAWSON, SCULPTOR.



A SUBURBAN CHURCH

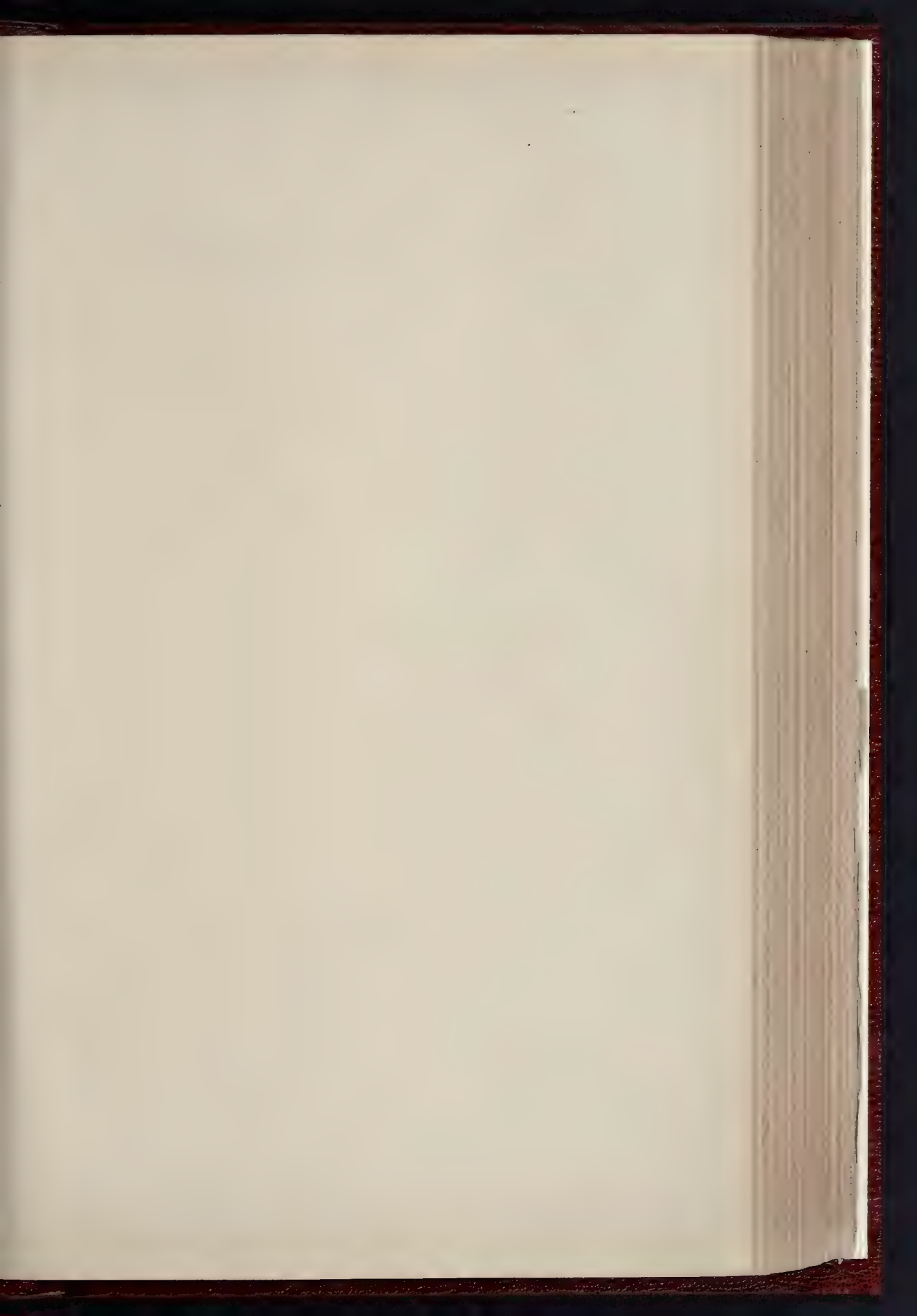




E.B.L. sculp.

F.B. LAMB Architect
51 Craven Street W.C.
August 1894.

PHOTO-LITHO SPRAGUE & CO. 485 EAST HARDING STREET FETTER LANE E.C.



THE BUILDER. APRIL 9, 1868.

Doctor's Consulting Rooms

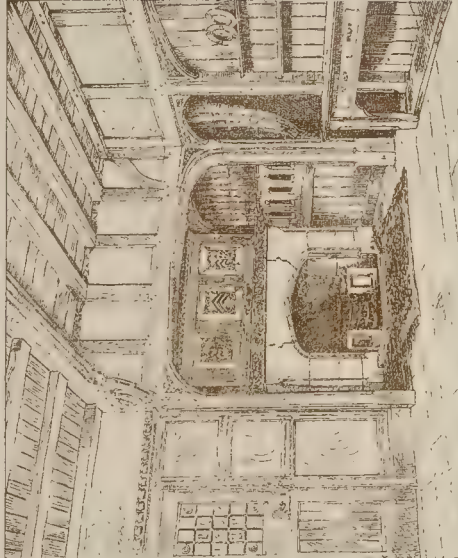
..... and Residences.....

Newhall Street & Cornhill Street.

Messrs Essex, Nicol & Goodman, Architects.

Newhall Street, Birmingham.

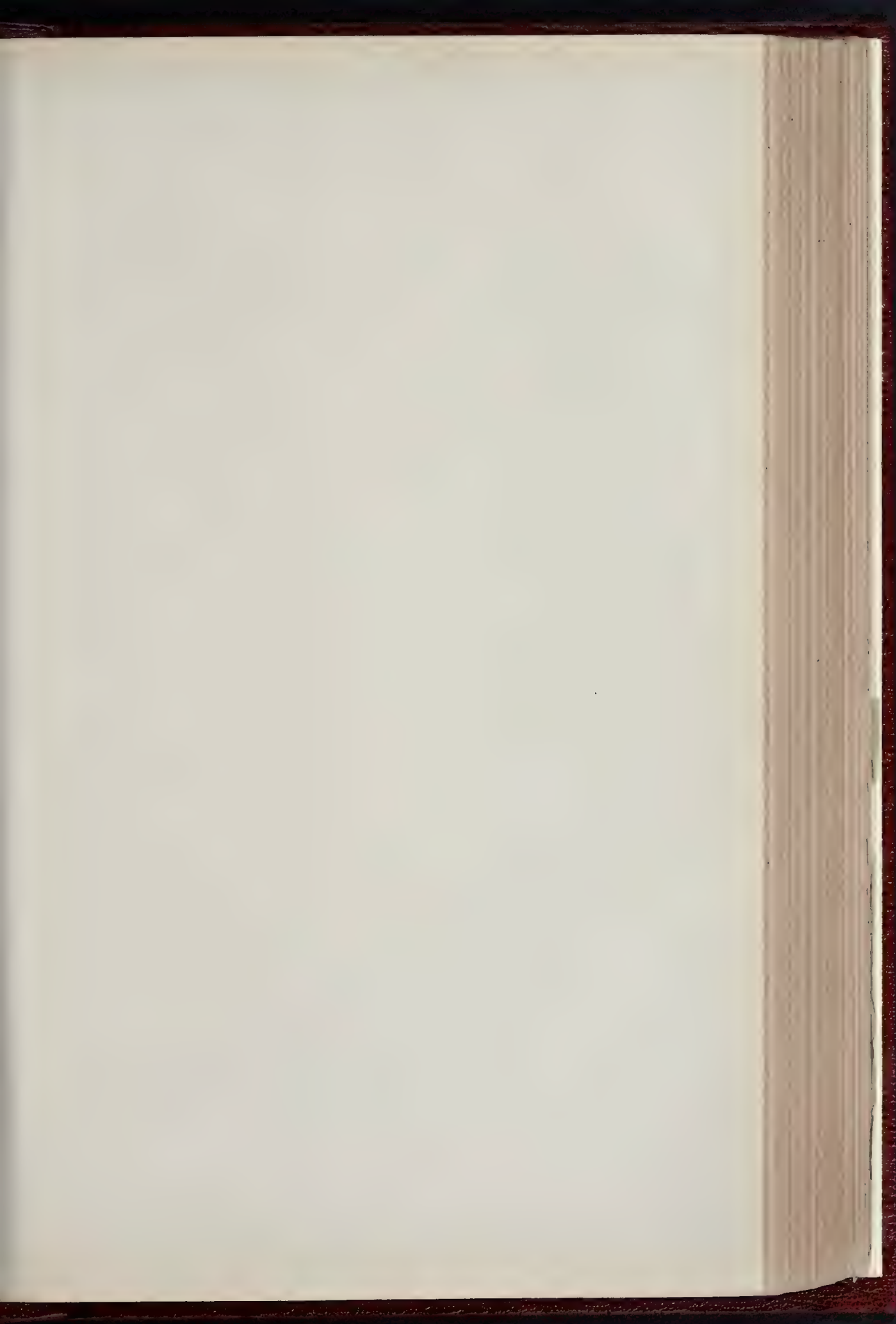




GROUND PLAN

THE LLEWELLYN ALMS HOUSES
NEATH GLAMORGAN
GEORGE E. HALLIDAY FR. B. A. ARCHT.





THE BUILDER, APRIL 9, 1898.



GROVE HOUSE, CHISWICK.



THE DINING-ROOM, GROVE HOUSE, CHISWICK.

Antwerp, erected in the late Antwerp Exhibition.

A modern and perfect system of sanitation has been applied to the premises, and extensive stabling and orchid houses erected. The alterations and re-decoration have been carried out under the superintendence of Mr. M. Newlyn, architect; the contractors being Messrs. Kilby & Gayford.

THE ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.

The tenth meeting of the present session of the Discussion Section of the Architectural Association was held at 50, Great Marlborough-street, on the 23rd ult.* Mr. Matt Garbutt, chairman of the Section, in the chair. The paper of the evening was entitled, "Approximate Estimates for Buildings," and was read by Mr. Henry J. Leaning, who commented on the vagueness of the ordinary methods of making preliminary estimates, illustrating his argument by the evidence given before the Parliamentary Committee on the Admiralty Buildings, in which the professional experts altered their opinions and contradicted themselves and each other frequently. He emphasised the difference between cubing preliminary sketches and cubing from finished drawings and specification. In the first case it is merely an allowance made to cover future developments. Buildings of the same plan and, practically, the same elevation, might be made to vary in actual cost by 4d. or 5d. per ft. perhaps. It was essential to know what the lowest limits were, and adhere to them. He saw no reason why the assessor in a public competition should not be allowed to state the lowest price or allowance per foot cube he would entertain. At some stage of his duties he was bound to settle this rate, and he was obliged to reject designs because he thought it, although by careful management the buildings might be built for the amount stated, would then be built in a manner worthy of the undertaking, would be impossible. Estimating from finished drawings and specifications required, of course, greater skill. Mr. Leaning demonstrated at considerable length the fallacies of cubing, and insisted upon the necessity of a more systematic method. He advised the elimination of roof foundations and made, and other items, such as staircases, lighting, sanitation, fittings, &c. He gave for special treatment, data for the building obtained from actual practice, and suggested interchange of such information among architects for the benefit of the profession. Having treated these disturbing elements separately on their merits, Mr. Leaning then expounded certain mathematical rules for obtaining the rates of variation in the price per ft. of the remaining part of the building, that the part between the lowest floor level and the roof plate. He had determined from actual examples certain prices for this part of the work, and had constructed a table based on areas of the rooms and the heights of the rooms for buildings of different sizes. The extreme advantage of such a table, he said, was the possibility of its universal application to all classes of buildings alike, from a factory to a hotel. The system also enabled an architect to work to the allowance per foot cube previously made, which under the present method was not possible. He explained the saving of time effected by using such a table, and maintained its equal accuracy to the working out of rough quantities, as was usually the case when a close estimate was required. He then dealt briefly with the effect of the variations caused by rises in wages or materials, difficulty of access, open tenders, or others by selected builders, &c. With regard to the latter he was of opinion that—in spite of the wide variation which sometimes occurred—the prices which ruled for the same work in competition did not vary by more than 5 or 10 per cent.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS: ARTISTIC COPYRIGHT.

A SPECIAL general meeting of this Institute was held on Monday evening, at No. 9, Conduit-street, Regent-street, Mr. Alex. Graham, F.S.A., Vice-President, occupying the chair.

The Chairman moved: "That in accordance with a recommendation of the Council, Professor Aitchison, R.A., be requested to allow himself to be nominated as President for the year of office 1898-99, and that consequently by-law 26, which limits the duration of the Presidential term of office to two years, be suspended."

The notice was seconded by Mr. John Slater, and carried unanimously.

A meeting to confirm the resolution for the necessary suspension of the by-law will be held on April 18.

An ordinary general meeting was then held, Professor Aitchison, R.A., presiding.

The minutes having been taken as read, Mr. Georges Harmand, Avocat à la Cour d'Appel, Paris, read a paper on "Artistic Copyright, with special reference to Architects."

M. Harmand said that one of his objects was to give an idea of the state of opinion on the Continent regarding the question of copyright. Over the greater part of Europe architects enjoyed protection for the works they created, and it was of greatest importance that the profession in England should have the same privileges. Unity in the protection of their art was the best means to its development and its triumph. The fact that for a long period architects had not claimed copyright in their works was no reason against the right. There was ample evidence to show that from remote ages architects had been accustomed to put their names, or to leave some other trace of their personality, on the monuments they erected. Instances of the custom were cited by the lecturer from a paper read by M. Ch. Lucas at Milan in 1892. Years before any other European country, England had made laws for the protection of artists and authors. Till quite recently, however, the reproductions of architects' designs for publication was an expensive matter, and only monographs of a few very important buildings or the works of a few very great architects had been published. In the present day it was easy for architects to get full reproduction of their works, and for the sake of their own memory, their credit, and their fame, they should strive to secure the preservation of their drawings and the guarantee of their authorship. In England the rights of artists in reproducing their works by printing processes were protected by statute, architectural drawings being expressly mentioned; but English architects apparently lacked confidence in their rights, and hesitated to claim the protection the law afforded them. The question of unification of the legislative measures relating to copyright had been well thrashed out at congresses held by the International Literary and Artistic Association at various cities in Europe; and, as a result, a Convention was agreed upon at Berne, in 1886, between Great Britain, France, Italy, Spain, Belgium, Germany, &c., which provided for the grant of copyright to, among other works, drawings and works of painting and sculpture, to engravings, prints, &c., and to "plastic works relating to geography, topography, architecture, and sciences in general," also to any production belonging to literature, science, and art capable of reproduction by printing, &c. But the law of some nations party to the Convention did not fully protect architecture. In Germany an architect enjoyed copyright in his designs so long only as they exist on paper; he lost his rights in his drawings as soon as a building was erected from them. In Great Britain, the lecturer understood, architecture was not protected by law, except for drawings and plans. Conferences had been held all over Europe by the Association above referred to, and strenuous efforts made to secure full protection for architecture. Having dealt with the object of copyright, its privileges, the class of work whose authors were universally admitted to be entitled to the right, the lecturer went on to show that, by their methods of work and the nature of their inventions, architects were in a similar position to painters, sculptors, and other artists, and should be conceded the same safeguards for their protection. Quoting judgments of French and Belgian legal tribunals, emphasis was laid on a recent decision at Antwerp, where

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it was held that, in order to be considered the author of a protected work, it was not necessary for a man to produce a work entirely original in all its parts; it was sufficient that he had made a design, traced a drawing and plan, and infused his own individuality into elements gathered from works whose copyrights had expired. Such was an artistic creation which merited the protection of the law. The lecturer then touched upon the arguments adduced against the rights contended for, and having shown their unsoundness, proceeded to treat of the relations between the architect and his employer. The architect furnishes plans and drawings, and agrees with his client for their reproduction in a building on a certain site. Such plans and drawings represent the original work of the architect. The client bargains for the possession and use of the building, and the enjoyment of its beauty, if it have artistic qualities. But, the lecturer contended, the right of reproducing the building on paper, by drawing, photography, or printing process, did not pass to the client, but remained in the architect. If the client desired in any way to reproduce his building pictorially by engraving or other process, the architect could consent, for an agreed consideration, or he could refuse. The client, again, had no right to the original drawings, but only to copies, and this was sufficient to warn the client that the architect intended to keep the copyright for himself. The drawings handed to the owner should show some evidence of their being copies merely, and should bear the architect's signature. The owner had no right to repeat the building on any other site, or to permit any one else to do so. The architect received fees calculated on the cost of the one building only. Repetition could only be made with the architect's sanction, and, if repeated, he was entitled to fresh fees. It was important for the preservation of his rights that the original drawings should bear the architect's signature. His signature could not well be preserved on the buildings they were made of, but as they were mere reproductions of his drawings, his interests would be sufficiently safeguarded by the signature being placed on the original drawings, and any copies, prints, or photographs of them. An architect could always print reproductions of his drawings under his own name; but the client had no more right to make prints or photographs of his buildings without the architect's consent than to repeat the buildings on another site. In concluding, the lecturer expressed his conviction that when architects felt that they could work and create for their profit, and have the reward of their pains and efforts, they would strive more after genuineness, and architecture as an art would progress, to the greater glory of beauty. If architects in Great Britain did not enjoy such rights in their creations as the lecturer had advocated, he hoped they would do their utmost to prevent the matter being overlooked in any new Copyright Act.

Professor Kerr said he was happy to propose a vote of thanks to M. Harmand for his very suggestive paper. If they looked at it as an academical argument, it was full of information and full of suggestiveness with regard to other subjects than the particular subject which was professedly in view. If they in this country asked for anything in the nature of architectural copyright, it would be of very great service to them in the way of establishing a claim upon public attention. There was a great difference between the appreciation of architecture in the country to which their friend belonged and its appreciation in this country of ours. They must never forget the radical racial difference. The Latin race seem to be possessed of the faculty of art in a way which the Teutonic nations could not pretend to; and, therefore, when their friend spoke of the architect's "glory," they were bound to tell him that the architect's glory would not be recognised in the English courts of law; and even architects' copyright, if it could be practically established (he thought it could be and had been established by their lecturer academically) would fare very badly at the hands of forensic gentlemen, who were disposed to put forward all their strength in examining an architect as to the points in which he claimed to have his copyright. The difference between architecture and the other matters to which the lecturer had referred was very considerable. The view that would be taken of architectural copyright in a court of law might be this: The lawyer would say that what the law of England—it being founded on com-

PROPOSED TECHNICAL INSTITUTE, SELLY OAK. Has been decided to erect a new technical school for Selly Oak, and a site has been secured near Burnbrook. The building will include necessary classrooms, reading-rooms, and a central hall for lectures, &c. Mr. B. V. Hirst, of Birmingham, is preparing the plans, and the cost is estimated at 3,000l.

The report of this meeting was sent to us too late for insertion last week.

mon-sense (and the common-sense of the multitude as distinguished from the common-sense of experts), what the law of England recognises as the subject of copyright, of patent rights, or of any protection of any sort, is "commercial value" and nothing else. "Show me," he would say, "what damage you have sustained in pounds, shillings, and pence, and then I will tell you what I think of it. But if you have only suffered damage in respect of self-appreciation, of *amour propre*, I am afraid the jury will not understand it," and there they would be. One argument that the lecturer put before them was certainly a very ingenious one if it were not a legal fiction: he insisted upon the architectural artistic merit being that of the drawing and not of the building. That seemed to him to be quite a new idea, and he did not think it was a correct idea, or an idea that would be recognised in courts at all, because they had had it before them in a somewhat, though not very, different form, when the question of the ownership of drawings was exhaustively argued, and all the judges were decidedly of opinion from their point of view that that which the architect supplied to his client in consideration of payment was his best services in designing, and that the paper drawings were the record of those services; thus it was that they declared that the paper drawings could only belong to the employer; that he was the proprietor of the results of the architect's services, and those results were the drawings. Now he personally was of opinion that they would never shake that conclusion; but they might try, and one way in which they could try was to bear in mind the distinction that reasons might not really be so anxious for it. They were, more or less, borrowing the ideas of those who had gone before, and, therefore, might feel that it was only fair that they should, if they were inspired with anything at all worth looking at, give it freely, as they had freely received from the past. M. Harmand congratulated them on being the first country in Europe to arrange for copyright; but he thought the general opinion was that they had followed the French in establishing any design rights at all; and it would be quite as well, if they had copyright at all, if they adopted the very simple and sensible arrangement of the French for securing it. As to what architects had done in the matter of copyright, many there would remember how in 1877 there was a Royal Commission sitting on this question, and the then President of the Institute, Mr. Charles Barry, was asked to give evidence on the matter, but not before the Council had informed the Commissioners that architects wished to be heard on the subject. Mr. Barry made a very strong stand. His proposal was that the right to reproduce a building should be reserved to the architect for twenty years, and any reproduction in the whole or in part to any scale, whether by the original client or any other person, should be forbidden. But the Commissioners' report the next year practically refused to entertain the proposal, and suggested nothing at all for the benefit of architects. But there was one difficulty in regard to their handle over their drawings. The original drawings were the contract drawings; they were signed by the builder, and therefore they were part of the contract; and it seemed to him that it was not quite the thing to suppose that they could claim them. Then, again, the artist stood on a different footing: he produced his pictures himself entirely. Their drawings were made in the office, not entirely by themselves, but under their direction. In fact, he was afraid that the law of copyright was in such an uncertain state that it was difficult to tell whether a remedy did or did not exist in the matter of designs being repeated. The Act which regulated the matter at the present time secured to them the right of copying, engraving, and multiplying their designs in the same way as other artists for the term of life, and to their successors for seven years after, and the forfeit of any contraband copies and a 10*l.* penalty, but the words "architectural designs" did not appear at all in that Act. The only reference to architectural design in the Act was, he thought, a footnote by the editor in publishing the Act for the use of the public, in which he said "an architectural design is protected under this word." The main point, he thought, for them to consider was, were they satisfied with the law as existing, or did they really desire radical amendments.

The Chairman said there was one difficulty about architectural copyright in small build-

drawings which an architect made became the property of the client because those were what he was paid for, seemed to him the more absurd the more one looked at it; and, if it were carried to the logical conclusion, the only thing to do would be for architects to make their drawings so bad and so simple that no one would care to have them. And if they did that often enough, they would convince clients that it was not the drawings that they were paid for, but the design of the house. Professor Kerr had said that the reason an architect could claim copyright in his production was because he had produced something that was saleable. After all, did not the architect do that in his building? Was not a building just as saleable as a picture? And was not that the architect's work just as much as the mere drawing put upon paper?

Mr. John Hebb said that it would be useless on the part of architects, in view of the decision as to property in architects' drawings, to attempt to set up any claim to copyright in design. Moreover, he thought it was very doubtful whether architects as a body would desire it. As a rule, they felt gratified when their designs were imitated or copied.

Mr. E. W. Mountford asked the lecturer if he knew whether the firm of English architects who had gone so far as to patent a design of theirs were satisfied with the result.

Mr. E. W. Hudson said that M. Harmand had paid them the compliment of supposing that they were all desirous of obtaining copyright of their drawings, but there might be some who were not so anxious for it. They were, more or less, borrowing the ideas of those who had gone before, and, therefore, might feel that it was only fair that they should, if they were inspired with anything at all worth looking at, give it freely, as they had freely received from the past. M. Harmand congratulated them on being the first country in Europe to arrange for copyright; but he thought the general opinion was that they had followed the French in establishing any design rights at all; and it would be quite as well, if they had copyright at all, if they adopted the very simple and sensible arrangement of the French for securing it. As to what architects had done in the matter of copyright, many there would remember how in 1877 there was a Royal Commission sitting on this question, and the then President of the Institute, Mr. Charles Barry, was asked to give evidence on the matter, but not before the Council had informed the Commissioners that architects wished to be heard on the subject. Mr. Barry made a very strong stand. His proposal was that the right to reproduce a building should be reserved to the architect for twenty years, and any reproduction in the whole or in part to any scale, whether by the original client or any other person, should be forbidden. But the Commissioners' report the next year practically refused to entertain the proposal, and suggested nothing at all for the benefit of architects. But there was one difficulty in regard to their handle over their drawings. The original drawings were the contract drawings; they were signed by the builder, and therefore they were part of the contract; and it seemed to him that it was not quite the thing to suppose that they could claim them. Then, again, the artist stood on a different footing: he produced his pictures himself entirely. Their drawings were made in the office, not entirely by themselves, but under their direction. In fact, he was afraid that the law of copyright was in such an uncertain state that it was difficult to tell whether a remedy did or did not exist in the matter of designs being repeated. The Act which regulated the matter at the present time secured to them the right of copying, engraving, and multiplying their designs in the same way as other artists for the term of life, and to their successors for seven years after, and the forfeit of any contraband copies and a 10*l.* penalty, but the words "architectural designs" did not appear at all in that Act. The only reference to architectural design in the Act was, he thought, a footnote by the editor in publishing the Act for the use of the public, in which he said "an architectural design is protected under this word." The main point, he thought, for them to consider was, were they satisfied with the law as existing, or did they really desire radical amendments.

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ings particularly. There was a scale of payment for small buildings, which required a great deal of consideration and a great deal of design, was quite disproportionate to the time and skill expended upon them. That certainly would like to have these things protected. He spoke of such things as small labourers' cottages, built either singly or in pairs. It did seem rather hard that, when a man got a mere nominal sum for doing a labourer's cottage or a pair of them, the owner of those cottages should be able, not only copy them all over his estate without paying a single thing for them, but that he should be able to lend or give the designs to all his friends and neighbouring landowners. But the real difficulty in the way was this, that it was very easy to make such trifling alterations as might take them out of the law of copyright and leave the architect helpless in the matter. There was one thing to be observed in regard to the general discussion: that drawings were quite a late invention. Every considerable building from the sixth to the eighteenth century had been built from models. He did not say that drawings were not used as an aid to the architect, but they were judged by the model. It had been said that it was difficult to know what damage could be done to an architect by his designs being copied by another. He thought that the damage was two-fold: the first place, if another had been employed instead of the original architect, the latter had lost the remuneration that he could have earned on being employed; and, secondly, nobody was well reproduced when he was copied by another who had not his thought and skill.

The Chairman announced that the next ordinary meeting will be held on the 18th inst. when Mr. Alexander Paterson will read a paper on "Domestic Architecture in the United States."

The meeting then terminated.

SANITARY INSPECTORS' ASSOCIATION.

At the meeting of this Association, held at the 2nd inst., at Carpenters' Hall, London, a paper on "Sanitation in the Homes of Working Classes," prepared by Mr. T. Moss Flower, Surveyor to the Portishead Urban District Council, was read by the Chairman, Mr. G. T. Dee (Westminster). Working class homes in small urban and rural districts were very frequently insanitary, said the lecturer, from defective roofs, thatch, the nearness of cesspools or pigsties, absence of drains, absence of water supply other than shallow wells, and defects of construction. Many small houses had no space, but a tiny fore-court, with no back plot, and others were built back to back. Even in larger houses, containing five or six rooms which had a small court or garden in rear, these were often crowded with fowls, ducks, rabbits, and other live stock kept in an uncleanly state. Such houses were frequently built in narrow streets, with no break for hundreds of yards, and with no proper circulation of air. Another class of insanitary houses frequently found was the old house, formerly occupied by some wealthy tenant, but now let in tenements to seven or eight different families. Far too many people were crowded into a given area in working-class neighbourhoods, even when the buildings were of a better type or of better construction; and in the centre of towns were often so high that working families were compelled to herd together and huddle themselves into the smallest possible spaces. The most prolific causes of overcrowding were, in the lecturer's opinion, defective land laws, the absence of by-laws and building regulations at the time the houses were built, and the apathetic administration of by-laws in many districts where they exist. Sanitary inspectors could not do more in a direct way to remove these leading causes, but they could effectively help by seizing every occasion of pointing out the existence of evils. Wherever they found gutters and drains choked, drains cracked, leaky, or chimneys untrapped, closets in wrong positions, unflushed or unventilated, rooms with fireplaces, with walls and ceilings dry rot, damp, walls built of soft bricks, or with mortar and without damp-proof course, facts be proclaimed unceasingly. A sanitary evil in rural districts was the practice of

employing a single inspector at, perhaps, only 50l. a year, to look after thirty or forty parishes, by putting under the charge from 6,000 to 10,000 houses, and at the same time compelling him to keep an elaborate set of books, attend committees, and run about to secure information for the medical officer of health, and all this with not unfrequently a threat hanging over his head of being turned out of his office or being over-zealous. It was the bounden duty of the sanitary inspector to help those who could not help themselves, which was the case with the working classes generally, to whom their willing services should be available at all times. Those who preached the gospel of health "should live the 'gospel of health,' and should conscientiously and fearlessly carry out their duties, even when it was necessary to withstand tyranny or risk the loss of their means of existence.

A vote of thanks was then accorded, and discussion took place, in which Mr. W. W. Vest (Walthamstow), Mr. Chapman (Fulham), Mr. Thomas (Bermondsey), and other members took part.

Correspondence.

To the Editor of THE BUILDER.

SEWER VENTILATION.

SIR,—I find your reference to my little pamphlet *The Sanitary Problem from the Sewer-Gas point of view*, is being misunderstood. You begin with the phrase "The ventilating of sewers by means of the grate at the street level and high extracting shafts," and further on comes the clause which says that my pamphlet "is intended to prove that this method of ventilation is a farce." I see no reason to object to the word "farce" so long as the high shafts only are intended, but if it is taken as describing the position I take with reference to the street-level gratings, it is entirely misleading. On page 6 I describe the latter as the "best means of effecting natural oxidation," and at page 14 my position in the whole matter will be seen when I say "free natural oxidation to the utmost possible, with auxiliary artificial oxidation wherever necessary" is a sound principle of sewer ventilation. And, I may add, this is no mere statement of an opinion, it is based on a fact which is being demonstrated at Sutton, Epsom, Edinburgh, Fulham, &c., in ordinary every-day work.

WM. BROWN.

BOOKS RECEIVED.

SANITARY ENGINEERING. By W. Paul Gerhard, E. (New York: Published by the Author.)
DISPOSAL OF REFUSE FROM THE CITY OF LONDON. By G. Lister Sutcliffe. (London: H. Hodgkins.)
THE NEW YORK FIRE DEPARTMENT. By Hugh Conner. (London: C. & E. Layton.)
SOCIETY OF ENGINEERS. Transactions for 1897. S. & F. N. Spon.)

OBITUARY.

MR. T. A. SKELTON.—The death of Mr. T. A. Skelton, architect and surveyor, Southampton, occurred at Burlington, Shirley, on the 25th ult.

GENERAL BUILDING NEWS.

BRADFORD PARISH CHURCH RESTORATION.—On the 26th ult. the members of the Bradford Historical and Antiquarian Society visited the Bradford Parish church to inspect the work of enlargement and restoration now being carried forward. At the suggestion of the Society, Mr. T. H. Healey (architect), who has been in charge of the work of restoration, gave an outline of the history of the church, and also of the proposed works. Referring to the work now in hand, Mr. Healey said that it was proposed to erect new vestries for the clergy and choir, and a large room for storing the numerous documents and books connected with the parish church. These erections would be on the north side of the church, and would be in the line of the old nave. The old masonry wherever possible, but some of it was so bad that it would need to be replaced by new masonry. North and south transepts would also be erected, these being necessitated by the removal of the two galleries. The south aisle and roof, put up in 1832, would be replaced, in character with those on the north side. As much as possible of the ancient woodwork of the north aisle roof would be retained, but it was not proposed to touch the chancel roof, except to fill up the panels with decorated work. The font would be removed from under the tower, and placed in the south aisle. The founders, under Mr. Healey's guidance, made the plan of the building. An interesting feature which was pointed out was the original opening to the staircase leading to the ancient roof-loft which in the Reformation times spanned the chancel arch.

Upon this loft was formerly placed a crucifix fronting the congregation. The lower entrance to the chancel was from the north wall of the Leventhorpe Chapel, and by the removal of the organ can now be clearly seen. As it is not proposed to interfere with this portion of ancient masonry, the old staircase will still remain as of yore. The ancient piscina, which was discovered in renovating the chancel in 1866, will be found projecting from the south wall of the chancel, where it has remained concealed since the days of the Reformation. The destruction of the vestry which stood north of the chancel and east of the Leventhorpe Chapel brought to light an ancient "squinch."—*Bradford Observer.*

CHURCH, GYFFELLON, NEAR PONTYPRIDD.—St. David's Church, Gyffellon, near Pontypridd, has just been enlarged at a cost of 2,700l. The part reopened consists of a nave, 84 ft. 6 in. long by 24 ft. wide; south aisle, 84 ft. long by 13 ft. wide, with narthex 22 ft. long by 8 ft. 6 in. wide, and will accommodate 500 adults. When the new chancel, organ chamber, and vestry are completed the church will afford accommodation for 550 people. The architect is Mr. Bruce Vaughan. The carving has been carried out by Mr. William Clarke, of Llandaff, and the church has been built by Messrs. A. J. Howell & Co., of Cardiff.

RESTORATION OF AUSTERFIELD CHURCH, YORKSHIRE.—The church at Austerfield, the home of the Pilgrim Fathers, has just been restored, under the direction of Mr. C. Hodgson Fowler, of Durham. The pillars and arches, which were found hidden in the north wall, have taken their original place in the interior of the church. Nothing has been done to these pillars and arches beyond cleaning them of plaster and colour-wash. The bulk of the exterior walls, which are about 4 ft. thick, have required little but clearing of plaster pointing. They are of about the same age as the pillars and arches referred to. The walls of the new aisle on the north side have been made as massive as the old work. The new work, like the old, is of Roche Abbey stone. Mr. J. H. Bowman, of the firm of Messrs. Bowman & Sons, Stamford, has acted as clerk of the works. —*Sheffield Telegraph.*

WESLEYAN CHURCH, LEEDS.—A new Wesleyan school-church has just been erected in Ladytyle Lane, Beeston Hill, Leeds. Plans were prepared by Mr. G. F. Danby, architect, Leeds, and the building has been erected under his superintendence. It is built of brick, with stone dressings, and affords accommodation for 250 worshippers. There are three classrooms, and by means of a patent folding partition one of these can, when occasion demands, supply fifty additional seats. The total cost will be about 1,400l. Mr. W. Schofield has the contract for the brick and stone work, and Messrs. J. Tomlinson & Son that for the woodwork, a large portion of which is of pitch pine.

PROPOSED BAPTIST CHURCH, STOCKTON.—Plans for the new church proposed to be erected by the members of the Northcote-street Baptist Church, Stockton, are now being prepared by Mr. Richardson, architect, Stockton. A site has been purchased in Lightfoot-grove, off Bowsfield-lane.

WESLEYAN CHURCH, ILKESTON.—On the 30th ult. a new Wesleyan church was opened in Bath-street, Ilkeston. The new church, which is of Gothic design, has four entrances. It is constructed of red bricks, with terra-cotta and stone dressings, and has a tower and spire rising to a height of 120 ft. above the street level. The edifice is 86 ft. long from east to west, 62 ft. wide across the transepts from north to south, 44 ft. in width across the main body of the orchestra, and 21 ft. 6 in. across the orchestra, and 21 ft. 6 in. across the large vestry. There are also two other vestries (one for the minister and one for the choir). In addition to the large east window, there are thirty-four side windows, and eight oriel windows. There is seating accommodation for 940 adults, or a mixed congregation of over 1,000. The fittings are of pitch pine, varnished, and the glazing is of half-tint cathedral glass. The church has been built by Messrs. J. H. Vickers & Son, Nottingham, at a cost of 5,500l., the architect being Mr. George Haslam, of Ilkeston.

CONGREGATIONAL CHURCH, BARNSELY.—A new Congregational church, erected at Farrar-street, Barnsley, from designs of Messrs. Hemmell & Paterson, Sheffield, was opened on the 31st ult. The church will seat about 450 worshippers, and will serve also for a Sunday-school. It has cost about 1,300l.

PRIMITIVE METHODIST CHURCH, &C., SPRINGBOROUGH, NEAR GAINSBOROUGH.—Memorial services of a new Primitive Methodist church and Sunday-school room at Springthorpe, near Gainsborough, have just been laid. The estimated cost of the new building is 600l. Seats will be provided in the church for 120 worshippers, and the school-room will accommodate from fifty to sixty children. Mr. John Clark, of Sheffield, is the architect, and Mr. Cooper Snowden, of Grimsby, the contractor.

CONGREGATIONAL CHURCH, WESTBOURNE, BOURNEMOUTH.—This church was to have been opened on the 6th inst. The portion of the building which is now erected consists of a church with nave, and double transepts at the sides, the length of the nave being 70 ft., and the total width, including the transepts, 60 ft. There is also an organ loft and raised platform for the choir, situated behind the pulpit. The accommodation includes minister's and

deacons' vestries, school-room, and an elementary class-room. There is, however, left for subsequent erection, galleries in the side transepts and at the end of the nave; a tower, which will be 80 ft. in height, and class-rooms, a church parlour, and a caretaker's room. Seating accommodation is now found for 440 people, but when the galleries are added the church will hold altogether 703. The building is faced on the outside with Purbeck rock-faced stone, with Bath stone dressings and traceried windows, filled in with cathedral tinted glass in lead lights. The roof is covered with tiles, and the interior paved throughout with wood block paving. The architect is Mr. T. Stevens, and the contractors Messrs. Jenkins & Sons. Messrs. Bacon & Curtis have executed the heating arrangements, and Messrs. Pippard & Cooper the electric lighting.

BOYS' SCHOOL, NEWENT, GLOUCESTERSHIRE.—At a meeting of the School Board, Newent, recently, the tender of Mr. J. Bidmead, Newent, for 995l. 16s. 3d. was accepted for building the new boys' school at Picklenash. The estimate of the architect (Mr. J. P. Moore) was 1,000l.

CATHOLIC SCHOOLS, LOUGHGEL, BELFAST.—New Catholic schools have just been opened at Loughgel. The schools have been built for accommodation 250 children, and were erected by Mr. Bernard Boyle, Ballycastle, under the direction of Mr. J. J. McDonnell, architect, Belfast.

SCHOOL AND MISSION CHURCH, MIDDLETON, DURHAM.—A new school and mission church has just been opened at Middleton. Mr. J. J. Wilson was the architect.

BOARD SCHOOLS, BEESTON, NOTTINGHAMSHIRE.—On the 31st ult. the new schools, which have just been erected at Beeston by the School Board authorities, were formally opened. The buildings, which are divided into two separate blocks, and face Nether-street, occupy a ground space of some 1,400 square yards. The main block, which is of two stories, is equally divided for boys and girls, and contains on each floor four class-rooms, each 24 ft. 8 in. square, two of which may be opened out by sliding partitions into the large halls, measuring 50 ft. by 30 ft. The usual cloak-room and conveniences are provided, together with double width staircases communicating floor with floor. The infants' block is one story in height. A cookery class-room, 26 ft. by 23 ft., may also be used as a laundry, and, adjoining, a caretaker's house is added. The whole of the work is expected to cost between 14,000l. and 15,000l., and the buildings are estimated to accommodate over 1,000 children, 300 boys, an equal number of girls, and 425 infants. The work has been carried out from the designs of Mr. A. N. Bromley, architect, of Nottingham, by Messrs. J. H. Williamson & Co., Nottingham. Mr. James Huckerby was the clerk of works.

WESLEYAN SUNDAY SCHOOLS, BOSTON.—The foundation stones of these buildings have just been laid. The new schools will be Gothic in style. The assembly-room, or hall, on the ground floor, is to be 59 ft. by 36 ft., and at the east end there will be a rostrum. There will be ten class-rooms on the ground floor, averaging from 11 ft. by 15 ft.; with two vestibules and two approaches or staircases to the chapel, and the necessary offices. The gallery round the main room is to be large enough to hold 300 children. The gallery will have six class rooms and a church parlour. Mr. W. Greenfield is the contractor for the new building, and Mr. W. Darby clerk of works. Messrs. Gelder & Kitchen, of Hull are the architects.

BUSINESS PREMISES, LONDON.—New premises have been built in Warwick-lane, City, for Mr. Charles Taylor. The new building, which has a total area of 3,000 square feet, has been erected from the designs of Mr. Walter Slair, and the contract, amounting to 6,000l., has been carried out by Messrs. Chessum, of Haggerston.

EXTENSION, MANSFIELD HOSPITAL.—The opening of the new wing of the Mansfield Hospital—known as the Diamond Jubilee Ward—took place on the 25th ult. Mr. R. F. Vallance was hon. architect.

CATTLE MARKET, PONTYPOOL.—A new cattle market is about to be constructed at Pontypool. The architect is Mr. Lougher, Pontypool.

CATHOLIC CHURCH, BOCKING, ESSEX.—The foundation-stone of the new church and convent of the Immaculate Conception of St. Francis, at Bocking Bridge, was laid and blessed on the 26th ult. The architect is Mr. J. F. Bentley, Messrs. A. Brown & Son are the building, and Mr. W. L. Tett is clerk of the works. The buildings comprise the church, with sanctuary chapel and transept, cells, corridors, refectory, kitchen, and all the domestic requirements of a religious house. The new convent is being built close up to the old residential house now occupied by the nuns. The church, which is to be of red brick with stone dressing in the Early Decorated style, and faces the road leading from Bocking to Halstead. A large wooden cross is erected on the site of the altar. The convent is expected to be finished by next October. The cost is to be about 7,000l.

NEW MUSEUM, WEST HAM.—At a meeting of the West Ham Town Council—recently, the Public Libraries and Technical Instruction Committee reported that Messrs. Gibson & Russell had submitted the plans which they had prepared for the new museum to be erected on the site in Romford-road adjoining the Institute, agreed to be purchased by the Council for 1,200l. The report was adopted.

THE STAFFORDSHIRE BUILDING TRADE.—The building trade throughout North Staffordshire is in a most healthy condition, and there is a general consensus of opinion among master builders and operatives alike that the coming spring will be one of the busiest that has been experienced for years. Unfortunately there are breakers ahead in the shape of labour troubles, but it is to be hoped that the course that has been pursued for several years past will again be adopted, viz., arbitration on the points of disagreement. Bricklayers report employment as good, with practically none out of work. Joiners are busy, with a small percentage unemployed. Plasterers are very busy. Stonemasons report trade as exceptionally brisk. Painters and plumbers report a decided improvement in the condition of employment. At Leek business in all branches of the trade is good, and all classes of operatives are well employed. At Crewe there are no operatives in the building trade out of work, and full time is general. At Stafford all branches report a decided improvement in the state of employment, and full time is now general in all departments, with none out of work.—*Staffordshire Sentinel.*

MASONIC TEMPLE, STEVENSTON, NEAR GLASGOW.—On the 26th ult. the memorial stone of a new Masonic Temple in connexion with Stevenson Thistle and Rose Lodge, No. 160, was laid. The new Masonic Temple is situated in New-street, adjoining the present lodge premises. It is being erected from plans prepared by Mr. John Armour, architect, Irvine.

HIPPODROME, CRANBOURNE-STREET.—A large site has been cleared, between Ryder's-court and Earl's-court, on the north side of the street, for the erection by a company of the New Hippodrome, together with shops and residential chambers, from the designs of Mr. Frank Matcham. The street is named after the Cecils, Marquises of Salisbury, and Viscounts Cranbourne.

NEW BATHS, KENSAL TOWN.—The new baths at Wedlake-street, Kensal Town, have just been opened. The architects of the baths were Messrs. Harner & Pinches, and their designs have been carried out by Mr. C. Wall, builder, of Chelsea. There are fifty-one private baths, namely, twenty-five for men and sixteen for women. The large swimming-bath for gentlemen is 83 ft. long and 30 ft. broad. A gallery runs round the sides, and there are fifty-seven dressing-boxes for the accommodation of swimmers. In the smaller bath, 60 ft. long and 25 ft. broad, for ladies, there are thirty-five dressing-boxes. The laundry contains a high-pressure washing machine, one hydro, an ironing machine, and four steam tubs with the usual fittings. In the basement is a blacksmith's and fitter's workshop, and near to it is the officers' mess-room and the store-room.

BUILDING IN LEEDS.—At the ordinary fortnightly meeting of the Leeds Corporation Building Clauses Committee on the 1st inst. the number of plans submitted for new houses and business premises, and for alterations to existing structures, was 126.

PROPOSED COTTAGE HOSPITAL, MORECAMBE.—Plans for a cottage hospital at Morecambe have been approved. Mr. Wright is the architect. The estimated cost of the building is 2,500l.

COTTAGE HOMES, CROYDON.—A block of cottage homes for the accommodation of poor children under the charge of the Board of Guardians, which for some time past has been in course of erection in the Mayday-road, Croydon, was opened recently. The homes—six in number—stand on rather more than an acre and a half of ground, and are built in semi-detached pairs, two stories in height. Each home is planned to accommodate a foster mother and twelve children. The front entrance door opens into a hall. The living room, measuring 21 ft. by 13 ft., is placed at the back of the building for the special purpose of obtaining a southern aspect, and with windows overlooking the grounds. The scullery, which is also at the back, measures 15 ft. by 13 ft. 6 in. The larder and store room, with the bath room, are located in the front of the building. The upper floor is taken up with the bedrooms, &c. Each home contains a separate bedroom for the foster mother, and three bedrooms of varied sizes for the children, to accommodate respectively five, four, and three beds, with an average floor space of 42 superficial feet to each bed, and the windows are arranged to provide for cross ventilation. The cost has been as follows:—The buildings, 4,450l.; the boundary walls, fences, playgrounds, laying out gardens, &c., 450l.; total, 4,900l. Mr. West was the architect.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, FULWOLD, LANCASHIRE.—Mr. E. A. Sandford Fawcett, Inspector appointed by the Local Government Board, held an inquiry recently at the offices of the Fulwood Urban District Council into the application of the Council for sanction to the borrowing of 7,000l. for purposes of water supply. The Engineer (Mr. Myers) gave evidence as to the details of the proposed extension, and the Inspector afterwards drove over to the works at Grimsargh.

NEW SEWERAGE SCHEME, ABERDEEN.—In order to meet objections by the Dee Fishery Board as to the discharge of sewage into the River Dee by the suggested low level sewer or by storm water culverts, Mr. W. Dyack, C.E., Borough Surveyor,

Aberdeen, has revised his scheme of main drainage works. *Inter alia*, Mr. Dyack proposes to reconstruct the present main outfall sewer from South Esplanade along Sinclair-road as far as Torry Harbour. The estimated cost of the modified scheme is 67,670l., as against 72,565l. for the original scheme. The cost of surface water sewers, which might be constructed in future, is estimated at 9,820l., and that of diverting the Duff, from the Upper Dock along Market-street at 9,200l.

SEWAGE WORKS, ABERFELDY, PERTHSHIRE.—On the 30th ult. the new sewage disposal works at Aberfeldy were formally opened. Mr. W. R. Copland, Glasgow, was the engineer, and the contractors were Messrs. Nimmo & Coupar.

LANCASHIRE AND YORKSHIRE RAILWAY AND THE SHIP CANAL.—The branch line of the Lancashire and Yorkshire Railway connecting the system of the Company with the Ship Canal docks at Salford was opened for merchandise traffic on the 28th ult. It is a line nearly a mile and a quarter in length, and has its beginning at Windsor Bridge, in Salford. For the most part it is carried underground through a series of tunnels. In its beginning it runs from Windsor Bridge between retaining walls as far as Liverpool-street. Then under that street there is a tunnel 473 yards long, passing under the main line of the London and North-Western Railway Company and Regent-road, and ending at a point near Dorrington-street. A Nos. open cut, underground retaining wall is next constructed, and then there is another tunnel from Martha-street to Robert Hall-street, 291 yards long. Continuing, there is an arching of the streets between Robert Hall-street and West Park-street, with retaining walls between. A third tunnel of 172 yards carries the line to Hulton-street. From that point the line ascends, and reaches a level at the rate of the top of the seven-story warehouse on the north side of No. 8 Dock. The height of the tunnels is from 17 ft. to 23 ft., and the depth of the line below the surface varies from 35 ft. to 45 ft. Mr. W. B. Worthington, the chief engineer of the Company, was the engineer, and Mr. L. Franklin has acted as resident engineer. Mr. Thomas H. Trigley, of Middleton Junction, was the contractor.

METROPOLITAN SEWERAGE WORKS, CHELSEA.—The London County Council notify their intention to apply to the Home Secretary for his consent to their taking, by compulsion, certain lands and buildings in St. Luke's parish, being part of Cremorne Wharf, in Lots-road, and Nos. 17-37 (odd), Lots-road, about 1,812 square yards in area. They want the land for an engine-house, and for other works, in order to relieve the low-level sewer at times of heavy rainfall by pumping water therefrom, and, similarly, to relieve the Countess's Creek sewer when heavy rainfall occurs during high tide in the Thames.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, TOTNES.—A memorial window has just been unveiled in Totnes Parish Church. The window, which is of four lights with tracery, is placed in the south aisle. The work was carried out by Messrs. Fouracre & Son, Plymouth.

MEMORIAL BRASS, LALEHAM CHURCH, MIDDLESEX.—A memorial brass to Thomas Arnold, D.D., was placed on the north wall of Laleham Church on the 31st ult. It is carved in brass, with letters in relief, the work being executed by Messrs. Benham & Froud, Limited, London.

FOREIGN.

FRANCE.—The *Journal Officiel* has published the decree classing the new metropolitan railway as "d'utilité publique," and the works will therefore be immediately commenced.—M. Henri Bouchot has been appointed Curator of the engravings department of the Bibliothèque Nationale, in place of M. Duplessis, resigned.—The Japanese collection at the Louvre is in process of reorganisation in the ground-floor galleries towards the quay.—The Luxembourg Museum has been reopened to the public, after having been closed for a long time for important alterations.—M. J. Paul yvon Le Poer has completed a new picture intended for the Hôtel de Ville of Paris, and which represents an episode of the Fronde—the arrest of Councillor Brousse.—The "Société Nationale des Architectes de France" has opened its seventh competition, the programme being "Un pavillon de repos dans une Exposition Universelle."—On April 17, at St. Maurice, will be inaugurated the monument erected by the Department of the Seine to the memory of Delacroix.—Last Sunday a new bridge across the Seine was opened at Charenton, not far from the Pont du Confians.—The Chapelle Sainte Eugénie, at Biarritz, built in 1855, under the order of Napoleon III., is in course of demolition.—A monument is to be erected at Agen in honour of the poet Jean-Baptiste Poquelin, the sculptor who has it in hand.—The Congress of French Architects will be held this year at Paris, from Monday June 20 to Saturday June 25.—There is talk of bringing the waters of the Lake of Annecy to Lyons by a canal of 142 kilometres long. It is estimated that this would give Lyons a water-supply of 62,000 cubic metres per day.—The municipal authorities of Toulouse have commissioned M. Jean Paul Laurens

to paint a large subject for the ceiling of the "Salle des Illustres," in the Capitoie, representing in allegorical form the deliverance of the inhabitants after the death of Simon de Montfort.—We hear of the death of M. Ernest Henri Lagrave, architect, who has died at Paris at the age of 60. He was a pupil of Garnot and of the Ecole des Beaux-Arts. Being appointed an Inspecteur des Travaux to the City of Paris, he collaborated, in the capacity, in the construction of the churches of St. Joseph and La Trinité. He built the large hôtel Comte Pillet Will, in the gardens of the Rue Monnaie. To him also we owe the châteaux of Lamotte Chaudemier and of Triebardou. He was an able artist. His son, M. Paul Lagrave, is a "diplôme" architect and also Inspecteur des Travaux under the Paris Municipality.

AUSTRIA.—The town council of Korneuburg have communicated with the Imperial Commissioners of Art and Historical Monuments with regard to the proposed restoration of the façade of the Augustinian Church. It is to be restored to its original form, and a copper cupola is to replace the temporary porch at present on the tower. The Commissioners have agreed to support the claim for a grant from the Fund of Public Religion for this purpose. The restoration of the parish church of the town is also to be taken in hand.—In 1866 a committee was constituted in Prague, on the invitation of the Emperor, for the purpose of devising the best methods of preserving and enhancing the artistic and historical interest of the town. The committee has now handed in its resignation on the ground that insufficient attention has been paid to their recommendation by the Municipal Council, preferring, as they express it, to lay down their office rather than to depress the public imagination by the appearance of the worst possible property, loved after.—At a meeting of the Chamber of Commerce of Reichenberg, held on the 18th ult., it was unanimously decided to build new offices for the Chamber. A committee of thirteen has been nominated to superintend the matter. A preliminary estimate of cost (130,000 florins) has been agreed upon.

The next meeting of the architects was held in the Palace Buildings, Johannesburg, recently for the purpose of considering the advisability of forming a society to promote friendly intercourse amongst the members of the profession, and to afford facilities for the furtherance of the study of architecture. Mr. G. W. Nicolay was voted to be the president of the proposed association, under the title of the Johannesburg Architects' Society, and to invite co-operation of all members of the profession.

SYDNEY.—The annual meeting of the Institute of Architects of New South Wales was held on February 16, at 82, Pitt-street, Sydney. The President of the Institute (Mr. J. Barrie) read the report of the meeting, and said that they seemed in New South Wales to have entered upon a new architectural era—the era of the red-tiled roof, and a feverish strain after the picturesque. The pity of it was that the strain was so often too painfully palpable. There was really no reason why their houses should be so aggressively red. However, that was the matter of taste. What was far worse was the innate vulgarity which impelled people to spend the greater part of their available cash in making the front of their houses ornate, while the remainder was carried out in the shoddiest possible manner. Some time ago, when it was decided that new Houses of Parliament were required, a deputé of architects was sent to the Institute of the Institution of the Minister for Works to ask that designs for those buildings might be obtained by means of a public competition. They had strong case. The Minister listened to what they had to say, and promised to lay the matter before his colleagues; but nothing came of it—no even the customary report. Their attitude seemed to have been misunderstood, for a statement has since appeared to the effect that the Minister considered the Government Architect perfectly competent to carry out any work which might be entrusted to him, and that his staff included some of the most able men in Australia. None were more ready to acknowledge the truth of that than the architects, but they would not admit that for reasons as those as those the Government Architect's department should be employed to design all their public buildings. There was one thing which they were determined to do their utmost to suppress. He referred to the large amount of private architectural work done by the servants of the Public Service Board. If they were not allowed to compete for Government work, he thought that they were at least entitled to demand that Government officials should not be allowed to compete against them.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. W. Henman, architect, Birmingham, has taken into partnership Mr. Thomas Cooper, and they will carry on practice together at 31, Cannon-street, Birmingham. Mr. Cooper was former pupil of, and then assistant to, Mr. Alfred Waterhouse.

PROPOSED STRAND IMPROVEMENT.—The Strand Board of Works, at their meeting on the 31st ult. resolved to adopt the report of their Improvement

Parliamentary Committee, recommending that white Hart-street be widened so as to give a right line for the present congested traffic of the road, 40 ft. wide from Catherine-street to Clare market. As the result of negotiations with the representatives of the ground landlord, the Duke of Bedford, the Committee were able to arrange that the Strand Board's contribution towards the work, the estimated cost of the improvement, could not exceed 3,000*l.* St. Martin-in-the-fields Vestry having agreed to contribute 5,000*l.*, and the London County Council contributing the remaining three-fourths of the net cost. It was decided that the work be carried out in co-operation with the County Council and St. Martin's Vestry, subject to an agreement with the Duke of Bedford, and providing that the new frontages on white Hart-street, between Drury-lane and Catherine-street, when widened, shall be utilised as building frontages, in contradistinction to back terraces, and to the reasonable satisfaction of the Surveyor of the Strand District Board of Works.

BIRMINGHAM CITY SURVEYOR'S SALARY.—A recent report of the Public Works Committee to the Birmingham City Council deals with the question of the remuneration of the City Surveyor. In May, 1896, an arrangement was approved by which Mr. Till relinquished the office of City Surveyor, retaining the office of City Engineer, in a consulting capacity only, at a salary of 500*l.* per annum, and that of Consulting Engineer to the Birmingham and District Drainage Board, at a salary of 1,000*l.* per annum. The Committee were authorised to advertise for a new City Surveyor at a salary of 500*l.* per annum, stating that the person selected would be appointed Deputy Engineer to the Drainage Board at a salary of 300*l.* per annum. Under this arrangement Mr. Till's price was appointed, July 28, 1896, City Surveyor, and Mr. Knight, Superintendent of the Sewers and Rivers Department, paid by the Corporation a salary of 500*l.* per annum, was also employed by the Drainage Board, who have recently been paying one-half his salary. In consequence of the extension of sewage farms, the whole of Mr. Till's services at the greater part of Mr. Knight's were required by the Drainage Board. The reorganisation of the City Surveyor's department, the arrears of work, the proposed conversion of tramways, the inquiry into condition of the sewers of the city, and other matters, have practically absorbed the whole of Mr. Knight's time since his appointment. Mr. Knight applied for the office of Borough Surveyor of Derby, and the Drainage Board being anxious to retain his services, they approached the Public Works Committee with the view of relieving him of his duties to the Corporation, and of obtaining whole services for the Board. While this was in progress, the lamented death of Mr. Till used both bodies to take the whole question into consideration. At the following meeting an arrangement was arrived at:—(1) That Mr. Price should take the whole of his time to the duties of City Engineer and Surveyor; (2) that Mr. Knight should be relieved from his duties to the Corporation, and should be appointed Engineer to the Drainage Board; (3) that the Drainage Board should employ a separate engineering staff, with offices away from the Council House, and that the Board's contribution to the Corporation should cease. In pursuance of this arrangement, Mr. Price has given notice to resign his office of Deputy Engineer to the Board. As this arrangement had the effect of reducing Mr. Price's salary by 300*l.* per annum, it was necessary for the Public Works Committee to consider the question they should submit to the Council in the matter. The salary of Mr. Till prior to 1896 was 1,400*l.* per annum (including 400*l.* from the Drainage Board). Having regard to the further work which will devolve upon Mr. Price in the near future, the Committee unanimously recommend that his salary be increased to 1,400*l.* per annum from the 1st inst. The Committee have appointed Mr. E. B. Savage, Deputy Engineer at Norwich, to succeed Mr. Knight, Superintendent of the Sewers and Rivers Department, at a salary of 300*l.*

DUNDEE PUBLIC IMPROVEMENTS.—In connection with the city improvement made by the Corporation of Edinburgh in the rebuilding of the North Bridge and the widening of North Bridge, the Corporation took place recently of the areas of each of North Bridge-street recently acquired by city. The whole of the west side of North Bridge-street, from the bridge to High-street, with frontage of 350 ft., and a depth of about 130 ft., exposed for sale in one lot at 120,000*l.*, and purchased at that figure by the proprietors of the Scotsman. It is the intention of the Corporation to erect on the principal portion of the lot which faces Princes-street, new offices for the accommodation of all departments of the Scotsman, and on the east side of the street was sold to Commercial Bank for 35,000*l.*

FEDERATION OF MASTER BUILDERS' ASSOCIATIONS, LANCASHIRE AND CHESHIRE.—A Federation of Master Builders' Associations in Lancashire and Cheshire has just been concluded, and the rules will be issued to the members of the trade in the counties. The new organisation is formed on the lines of the Engineering Employers' Federation, its affairs will be controlled by an Executive

Council, the first President being Mr. R. Neill, of Manchester. In Manchester, Liverpool, Bolton, and several other towns the workmen have given notice for an advance in wages, and the object, it is stated, of the Employers' Federation is to give a united resistance to their demands.

BRISTOL ELECTRICITY DEPARTMENT.—The working of the Electricity Department of the Corporation of Bristol for the year ending March 25 shows considerable advance upon the working of former years. At the date of the last return—i.e., March, 1897, the Department had connected to their mains 614 customers, with 38,302 lamps. At the present date there are connected 814 customers, with 49,017 lamps, showing an increase of 200 customers and over 10,000 lamps. The extension of the public lighting has not yet been carried out, but it is in progress, and before the summer is over it is expected that the public arc lamps will be increased threefold. Extensions of the mains for private lighting have been or will be made within the next two months in the following places—Stapleton-road, Cheltenham-road, Gloucester-road, Elgin Park, Durham Park, Redland-gardens, Clifton Hill, The Promenade, Mortimer-road, Kensington-place, &c. The number of substations has been increased from thirty-one to thirty-nine.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—The twenty-fifth Voluntary Pass Examination of candidates for the offices of Municipal Engineers and Surveyors to District Councils, carried out by this Association, was held at the Institution of Civil Engineers, on Friday and Saturday, April 1 and 2. There were forty-nine entries for the examination, the written portion of which was taken on the first day. The whole of the second day was occupied with the *visu-voce* portion of the examination. The examiners were:—for Civil Engineering as applied to Municipal work, Mr. A. M. Fowler; for Building Construction, Mr. James Lemon and Mr. Joseph Lobley; for Sanitary Science, Mr. Francis J. C. May; for Municipal and Local Government Law, Mr. Charles Jones. Mr. A. M. Fowler was Superintending Examiner. The Examiners are all Past Presidents of the Association.

THE BIRMINGHAM MUNICIPAL SCHOOL ENGINEERING SOCIETY. The members of this Society held their annual dinner at the "Metropole," Birmingham, on Saturday last, under the Presidency of Mr. E. Fuhrmann Clarke. In his Presidential address on "Beauty in Engineering Design," Mr. Fuhrmann Clarke strongly advised engineers to cut themselves free from all preconceived notions of architectural effect, and pointed out that engineering designs, and most engineering materials, were not to be improved by the addition of architectural adornment. He further controverted the recent assertion of an eminent architect, that the practical training through which engineers passed in foundries and workshops, alongside men having no artistic training, was such as to completely destroy any perception of the beautiful which they might possess. The President further alluded to three of our most beautiful engineering works, viz.:—The Menai Suspension Bridge, London Bridge, and Waterloo Bridge, the designers of which were men who rose from the ranks and passed through that very course of training which had been deprecated—the one as a working stonemason, and the other as a millwright. In alluding to the Forth Bridge, which he considered to be the finest example of modern bridge design, Mr. Clarke pointed out that this result was largely due to its entire freedom from architectural embellishment, and that the assertion of the architect, that the aesthetic treatment of the design by the architect before mentioned, showed that want of perception in the possession of which, it was alleged, engineers so lamentably failed.—In the course of the evening the retiring President of the Society (Mr. Edward C. R. Marks) was presented with a silver rose bowl as a token of the esteem in which he is held by the members, and as recognition of the services rendered during the three years of his presidency.

ROMAN MANCHESTER.—On the 1st inst. a meeting of the Lancashire and Cheshire Antiquarian Society was held in the schoolroom of Chetham's College, when Mr. Charles Roeder, who has been making observations on the site of the new goods station of the Great Northern Railway being built in Deansgate, read a paper on "Recent Investigations on Roman Manchester." He mentioned that besides the discoveries on the station site there had been a few of the usual Roman relics found in the digging for the foundations of works in Quay-street, on the site of Dr. Byrom's old house. He thought Quay-street might be taken as the northern limit of the Roman town. There were now scarcely any visible relics left in Deansgate of the Roman period. The only record now above ground consisted in a piece of Roman masonry inside the former *castrum* and now occupied by a timber yard. Its position seemed to establish it as the *prætorium*. Mr. Roeder, dealing with the negative results of the investigations, observed that he could not record the discovery of any altars, inscriptions, or sculpture. He had found evidence that Mancunium had its local potters and iron smelters. The recent excavations, he considered, had added not a little to their knowledge, but what he had obtained were mere scrapings in comparison with what might have

resulted from a careful watching of former excavations such as those involved in connexion with the Cheshire Lines extension. He had been surprised how many objects he had met with in the little area he had traversed. They would now know how much better where to look for such objects in any further demolition of property in the city. Mr. Roeder exhibited the objects discovered, consisting chiefly of pottery, and including specimens of mosses and other plant remains.—*Manchester Guardian.*

REGISTRATION OF PLUMBERS.—At a public meeting, held at the Town Hall, Durham, the following resolution was carried unanimously:—"That this annual general meeting of the North of England District Council for the National Registration of Plumbers is of opinion that an organised and efficient system of registration of qualified plumbers is essential to the protection and preservation of the health of the community, and records its approval of legislative sanction being given to the registration movement, and its desire that the Members of Parliament in the district will support the Bill now before the House of Commons."

CAPITAL AND LABOUR.

STRIKE OF BRICKLAYERS AT DRIFFIELD, YORKSHIRE.—The society bricklayers at Driffield gave in notices which expired on the 31st ult., for a rise of a penny per hour in the per wages, which stand at sixpence. The masters offered an advance of a halfpenny, which was refused, and the men ceased work, the masters, who held a meeting previously, being unable to agree to any united action of action.

ABERDEEN JOINERS.—The Aberdeen Conciliation Board have rejected the operatives' demand for an eight-hours' day and also for an increase of the standard rate of wages from 8d. to 9d. per hour, it being resolved not to give any intermediate rise, and the wages remain as at present. It was agreed that overtime be paid at the rate of time and a half up to nine o'clock on ordinary days, and double time on Saturdays and after five o'clock on Saturdays; that for old work or the demolition of old buildings, the extra allowance be 6d. a day; that the rate of extra allowance for country work be 6s. per week; and that the period for giving notice of alterations in by-laws or wages should remain as at present, viz., from November 1 to February 1. Both parties have agreed to abide by the finding, the men's union, however, resolving to insist that in no case shall less than the standard rate of wages be paid.

BUILDING TRADE DISPUTE, SOUTH SHIELDS.—The men engaged in the building trade at South Shields struck work on the 1st inst. The bricklayers, stonemasons, and plasterers demand a penny an hour increase, from 9d. to 10d., and the labourers an increase of from 6½d. to 7d. The masters offered a uniform increase of one half-penny, but this offer the men refused.

THE BIRMINGHAM BUILDING TRADE DISPUTE.—On the 30th ult. a meeting of the employers, representing all branches of the building trade, was held in the Grand Hotel, Birmingham. Mr. John Bowen presided. The Chairman explained the result of the conciliation proceedings, and after a discussion a resolution in the following terms was passed:—"That this meeting, having heard the report of the conciliation meetings since the last general meeting of the trade, confirm the action of the several conciliation committees, and leave the matters in dispute in their hands for settlement or otherwise." With the object of preventing the serious disturbance to work which was threatened by the Masters' Conciliation Committees have been actively engaged, and as an outcome an offer to all sections of a half-penny per hour, to come into operation on October 1, was put forward. This proposal to meet the men half-way was discussed at two meetings in the Bristol-street Board Schools on the 30th ult.—the builders' labourers' section of the Birmingham and District Gas Workers' Union assembling to the number of fully 1,500 in one department, and the members of the Federated Society of Builders' Labourers of Great Britain and Ireland meeting in another room. It is estimated that about 3,000 labourers of one class or another were interested in the dispute. The builders' labourers' section of the Gas Workers' Union, after discussion, passed a resolution in favour of accepting the masters' terms. There was, however, a very strong feeling current against the idea that this should indicate a falling away from the position originally taken up. The men were confronted with the fact that employers had large contracts running, and that a stoppage would entail serious consequences, and with this in view, the more reasonably-disposed were favourable to the halfpenny concession in October. The Gas Workers' Union, being the more representative organisation in point of numbers, the Federated Labourers' meeting was largely influenced by the decision arrived at. After a protracted discussion, this meeting also accepted the terms of the masters, it being, however, distinctly stated that the concession was principally influenced by the feeling of the large organisation. In view of that decision it was held that any other course would be suicidal. While these meetings were in progress the members of a kindred organisation—the Amalgamated Society of Gas Workers, Bricklayers, and General Labourers

—met under the presidency of Mr. H. Simpson at the Adley-street Club House, and the feeling was unanimously against the acceptance of the masters' proposal. The society was represented by about 300 members, but their action was entirely subject to the meetings of the larger organisations. The plumbers, who were also affected, met in the Trades Hall, and resolved in favour of the masters' terms. —*Birmingham Gazette.*

CARPENTERS' DISPUTE, NEWPORT, MONMOUTHSHIRE.—A dispute has arisen between the Newport Master Builders' Association and the local branch of the Amalgamated Society of Carpenters and Joiners. It appears that some twelve months ago the men's Union amended their rules in order to prevent the working of overtime unless the masters agreed to pay an increased rate of wages per hour for such overtime. The Masters' Association declined to grant the rate asked for. Recently the Union called its members out of one of the shops at Newport, and have declared the shop a "black" one, because the master had insisted upon the men working overtime. The Masters' Association has called upon the Union to withdraw the boycott, and it is feared that unless the demand is acceded to the masters will retaliate by locking out all the Union men in the town.

THE DISPUTE IN THE CARPENTRY TRADE, COALVILLE, LEICESTERSHIRE.—In accordance with notices handed in, the carpenters in this district came out on strike on the 1st inst., the masters having refused to grant the 1d. per hour advance asked for. With the exception of two firms, however, they are willing to concede an advance of 3d. per hour.

FIVE PAINTERS.—The operative painters, who threatened to come out on strike on the 1st inst. if certain demands which they had made were not conceded, met with the employers on the 31st ult., and as the result of a conference the standard wage has been raised from 7d. to 8d. per hour.

THE BUILDING TRADE, KING'S LYNN.—During the past few days meetings of employers and men interested in the building trade have been held in Lynn to consider the grounds of an increase of wages. It is stated that the carpenters and joiners have intimated that they will be content with 6½d. per hour, an advance of 3d.; but the bricklayers demand 7d. per hour, which the employers decline to give, though they have offered to pay 6½d.

DISPUTE IN THE LEICESTER BUILDING TRADE.—As the result of further consultations between Mr. Thos. Smith, the local representative of the Board of Trade, and the Carpenters' Society, he invited representatives of the Master Builders' Association and the Carpenters' and Joiners' Union to another conference, with a view to arriving at a settlement of the differences existing between the respective bodies. The conference was held under the chairmanship of Mr. Smith at the Town Hall on March 29. After a considerable discussion, the employers proposed that the workmen continue working at the present rate of wages, namely, 8½d. per hour, with the reduction of two hours per week—50½ hours to 52½ hours in the summer months, the time being altered so as to commence work at 8.30 on Monday morning, instead of 6 o'clock; all other proposals and counter proposals to be withdrawn. The men proposed that the employers give 3d. advance, making 9d. per hour, but their proposal as to reduction of hours to be withdrawn for the present. Neither of these proposals being acceptable, the chairman, as a compromise, suggested that the employers give 3d. per hour advance, viz., 8½d. to 8½d., and that the working hours be reduced from 50½ to 52½ hours in the summer months, the reduction of hours to take place on Monday morning. As a result of the conference, it was agreed that the suggestions should be submitted for the consideration of the respective associations, the decisions to be reported at an adjourned conference. The conference was resumed on the 1st inst., when it was reported that the Employers' Association had agreed to accept Mr. Smith's suggested basis of settlement, adding a rider to the effect that there should also be a satisfactory settlement of the ready-made joinery question. The result of the men's meeting was to maintain their original proposal, to have 9d. per hour, but to withdraw the demand for the reduction of hours, and in the event of the employers not agreeing to this at the conference, they should offer to submit the details of the proposals and counter-proposals, of which original notice was given by each side, to an independent arbitrator, appointed by the Board of Trade. After repeated conferences between the chairman and the representatives of the two associations, it was found impossible to arrive at a settlement, and the employers subsequently passed the following resolution:—"The Master Builders' Association, having given Mr. T. Smith's proposal of March 29 re wages and hours their serious consideration, decide to accept the same if agreed to by the men's society by or before eleven o'clock on Saturday, April 2. If the men's society continues to reject Mr. Smith's proposals, the employers have no further offer to make for an amicable settlement of the dispute." This the men's representatives, acting on the instructions received from their meeting, could not accept, stating that as no settlement had been arrived at, circulars would have to be sent to each of their members instructing them to give the two hours' notice to cease work, in accordance with the existing work-

ing rules.—On September 30 last the operative plasterers gave six months' notice for alteration of working rules. Their requirements embraced an extra 1d. per hour, making 10d. per hour, twelve o'clock on Saturdays, preference to be shown to their own sons, with a limit of two apprentices in each shop, and some alterations under the heading of classification of work. Counter proposals were framed by the employers, and as a result of repeated meetings of the disputing parties, an amicable settlement has at last been arrived at. The new rules came into operation on the 1st inst. The operatives' gains are 1d. per hour, and twelve o'clock on Saturday, a mess-room to be provided. The employers expect to get a better supply of work by paying the higher rate of wages. A full number of working hours are to be made each day before coming on extra pay for overtime—a provision for cases of emergency—a book for signatures of men wanting employment or masters wanting men is to be kept, masters of the Association to have the first call, and, lastly, a standing Conciliation Board for the settlement of all disputes with a view to avoiding strikes or lock-outs has been established.—*Leicester Post.*

LEGAL.

ALLEGED FICTITIOUS BUILDING LEASES.

In the Chancery Division of the High Court of Justice, on the 1st inst., Mr. Justice Romer heard an *ex parte* motion on behalf of the plaintiff in the case of *Marham v. Weaver* for an injunction and a receiver of certain premises in Lower Sydenham. Mr. Latham, Q.C., who appeared in support of the motion, said the plaintiff had lent 1,000l. to the defendant Weaver, who was a builder, and had taken the mortgage on the property in question; but it had since been discovered that the leases were fictitious, and therefore the mortgages were useless, and the whole thing was invalid. There were two defendants to the record—Weaver and Walters—but, so far as the plaintiff had been able to ascertain, they were one and the same person. Plaintiff pressed upon the defendants to give him his money back, but he could get nothing from them, and he had now discovered that, although Weaver had no lease at the date of the transaction with the plaintiff, the defendant had got a lease since.

His Lordship: Of the same premises? Mr. Latham: Yes, my Lord, and he has mortgaged the premises to another man, and we cannot touch the mortgage. The reason I move *ex parte* is that we have reason to believe, and do believe, that if we had served the defendants with notice they would defeat our object. [Mr. Latham asked for Mr. Gardner, surveyor and auctioneer, to be appointed as receiver.]

His Lordship granted the application asked for, appointing Mr. Gardner receiver of the premises under the first motion day next sittings, subject to the rights of the first mortgage, and ordering an injunction restraining the defendants from assigning or otherwise dealing with the properties in the meantime, the receiver to act at once, plaintiff undertaking in security, and to accept short notice of motion to dissolve the injunction. Judge Leave was also given to serve upon defendants the notice of motion with the writ.

THE CHRISTIAN HERALD LIGHT AND AIR CASE.

In the Chancery Division of the High Court of Justice, on the 1st inst., before Mr. Justice Romer, the case of the *Christian Herald* Company v. Knight again came on for hearing.

Mr. Neville, Q.C. (with whom Mr. Sergeant for the plaintiffs, said he had to move his lordship for an order for the continuation of an injunction granted a few weeks ago in this light and air case, restraining the defendants to a certain extent from proceeding with the erection of their building so as to darken and obstruct the plaintiffs' ancient lights at their newspaper offices in Tudor-street, E.C. The defendants are constructing a building on the opposite side of the street. Negotiations had taken place between the parties for the purpose of arriving at some kind of arrangement, but they had been unsuccessful, and he must now ask his lordship to put the defendants on some terms in order that the plaintiffs might be safe until the trial of the action. The interim injunction was granted in respect of six windows on the ground floor on that part of plaintiffs' building which was immediately opposite the defendants' building. For upwards of twenty years the plaintiffs had had absolutely an unobscured light until the defendants put up their building, and it could not seriously be contended by the other side that their building did not take away a very substantial part of the light. The take away if they insisted upon their strict legal rights, they might be able to get the defendants' building down to a very low level, they were willing for the present to let the matter rest if the defendants would not take their building higher than the line of the other buildings on the same side in the same street—namely, 44 ft.

Mr. Farwell, Q.C. (with whom was Mr. Rowden),

for the defendants, said his clients had put in a modified plan.

Mr. Justice Romer: How high will the building be then?

Mr. Neville: We say 51 ft.

Mr. Farwell: We say 49 ft. Mr. Neville: Call it 50 ft., and that does not make any allowance for chimney stacks at all. By going up 50 ft., that will give them 6 ft. higher than the other buildings in the same line, and we say that is not a reasonable proposal, having regard to the fact that our light was absolutely unobstructed before they came. If the defendants would limit their building to a height of 44 ft. I will say no more to the interlocutory application.

Mr. Farwell said there was more in the case than his friend had stated. His clients had been allowed to go on and the plaintiffs' surveyor had said there was practically no obstruction to the light. The surveyor denied now that he had any authority to act for the plaintiffs, but he did not suggest now that there would be any interference with the light. This was not a case for an injunction at all. If there was anything to be compensated for at all, 50l. or 60l. damages would be sufficient. He did not think the Court, when it had heard the matter, would be satisfied that there was any substantial interference with the light.

Mr. Neville: I am satisfied with the injunction as stated.

Mr. Justice Romer: Put it down for trial forthwith.

Mr. Farwell: I want to raise the issue that their surveyor said there was no obstruction of light.

Mr. Justice Romer: Very well; but I suppose the plaintiffs will say he had no authority from them. It was arranged that the trial of the case should be taken on the first day when his lordship takes witness calls next sittings, the interim injunction being continued, only two experts to be called on either side.

THE CONSTRUCTION OF DRAINS.

At the Lambeth Police-court recently, Mr. J. C. Richardson, a builder, carrying on business as Albert Works, Peckham, was summoned, before Mr. Hopkins, at the instance of Inspector Stevenson, on behalf of the Camberwell Vestry, for unlawfully constructing a drain at the premises known as the South London Art Gallery and Technical Institute, Peckham-road, so as to be a nuisance. The proceedings were taken under the 42nd section of the Public Health (London) Act, and the case came before the court under somewhat peculiar circumstances, the Vestry appearing in a twofold capacity, they being, as the sanitary authority, prosecutors in the case, and as a corporate body the owners of the premises, in respect of which the proceedings were taken. The Technical Institute was only recently erected, and the contract for the work was secured by the defendant. The care for the Vestry was that at the beginning of the year the caretaker of the building complained of smells in his apartments, and made by Inspector Stevenson a defect was found in an iron soil-pipe, and in some of the connections between it and the lavatories. It was alleged by the Vestry that the joints had been made in a defective manner, but for the defence it was said that the work was carried out exactly as the specification provided it should be done. In addressing the Court for the defendant, said his client was being prosecuted by the Vestry for carrying out the specification too faithfully. The defendant's case was that he protested to the architect against the manner in which the work was required to be done, but without avail. He (Mr. Elliott) admitted that there was no defence under the section, but he submitted that the defendant was entitled to compassion, seeing that the Vestry were prosecuting him for carrying out too faithfully the instructions of their own architect. Mr. Hopkins ordered the defendant to pay a fine of 40s., at 3s. 3s. costs.—*Morning Advertiser.*

BUILDING LINE DISPUTE AT CREWE.

The case of *Harrison v. Wood* came before Mr. Justice Romer in the Chancery Division on the 31st ult., in which the plaintiff sought to enforce a covenant relating to a building line and also to restrain the defendant from encroaching beyond that line. It appeared that the defendant owned considerable piece of land in the Western-road, Crewe, and on February 16, 1894, sold a plot to the plaintiff, the conveyance containing the covenant in question. The plaintiff built some houses on the land and the defendant erected some adjoining land in 1896 he built some houses on his land just beyond the line of the plaintiff's portion. The defendant's main building was not complained of, the complaint being that the defendant had put bay windows on the houses which encroached about 18 in. beyond the building line. The defendant alleged that the plaintiff himself had broken the covenant by putting a small cornice to his houses about half way up the elevation, and that therefore he could not rely upon the covenant as against the defendant. His Lordship looked at the photos of the property and ridiculed the idea that the small cornice, which was simply a piece of ornamental work, was an infringement.

of the covenant. He also ridiculed the objection to the defendant's bay windows, which, he said, improved the property tremendously, adding, "It is a petty quarrel. Upon my word, some people quarrelsome to say the least. How anybody could complain of this, I cannot imagine."

Mr. Yardley, the plaintiff's counsel, said that he had been a great deal of correspondence over matter.

Mr. Justice Romer: I have no doubt about it. The smaller the matter, the greater the correspondence.

After some further observations his Lordship suggested that the matter should be settled by counsel without any further trouble, and a compromise was entered by which the plaintiff was freed from his covenant, and was at liberty to build bay windows of the same extent as defendant's, and the defendant to indemnify the plaintiff from any liability any third party he might possibly be put to in doing so.

Order accordingly.

THE FINALITY OF AN ARCHITECT'S CERTIFICATE:

CASE IN THE QUEEN'S BENCH DIVISION.

THE case of Buckland v. Trood came before Mr. Justice Darling, sitting without a jury, by consent, in the Queen's Bench Division, on the 31st ult. It concerned that in 1896 Messrs. Garner & Lovelock, mfrs. of builders, entered into an agreement with the defendant to make some alterations on the defendant's premises. It was provided by the conditions attached to the specification that the work would be executed to the full satisfaction of the architect, and that payment should be made upon certificate, and at the discretion of the architect.

February 5, 1897, Messrs. Garner & Lovelock signed to the plaintiff all moneys due or to become due to them under the first point of the contract. In dispute was as to various items of the work, amounting in all to 36l. 17s. 7d., which the defendant agreed to be negligently executed. As to the second point, the question was whether an item of 17s. 3d. for granite work executed by a Mr. Whitehead, was due from the defendant to Whitehead, or to the plaintiff as assignee.

Mr. H. F. Dickens, Q.C. (with whom was Mr. A. J. B. Dickson, Q.C. for the plaintiff, contended on the first point that the architect's certificate was final; and as the second point, that Whitehead was a subcontractor under Garner & Lovelock, and had no direct contract with the defendant.

Mr. Greene, Q.C. (with whom was Mr. Spokes), contended, on the second point, that in all the reports made where an architect's certificate had been held final, there had been words to that effect in conditions, which was not the case here. As to granite work, it had been agreed by all parties that that portion of the agreement should be canceled, and the work executed by Whitehead for defendant, and not for Garner & Lovelock.

His Lordship, after hearing the evidence, in giving judgment, said as to the first point he could not find evidence contradicting the architect's certificate. That certificate was final, and the defendant was not entitled to go behind it. On the second point, he had no doubt that the arrangement by which Whitehead took over the granite work from Garner & Lovelock was entered into with Garner's consent, and on that point the defendant succeeded. Judgment was entered for the plaintiff for 17s. 7d., and costs.

MEETINGS.

SATURDAY, APRIL 9.

Edinburgh Architectural Association.—Visit to Dalkeith Palace and Dalkeith Church.

MONDAY, APRIL 11.

British Society of Architects.—Annual meeting. 8 p.m.

FRIDAY, APRIL 15.

Institution of Civil Engineers.—Students' visit to the East and Junction Waterworks, Hampton.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to specification until May 16.

1,897, 2,275.—STONE-SAWING AND SIMILAR MACHINES: L. Leroy.—In reciprocating saw-mills the motion is imparted to the frame or mounted saw by rigid bars hinged vertically, and moving in parallel positions in a fixed plane whose direction is the same as, or parallel to, the desired direction of the cuts of the saw, whilst the motion of the saw is opposite to that of the bars; the arrangement being such that the bars may be moved about and taken to where the blocks of stone are cut.

1,898.—A COMBINED PLUMBER'S OR SOLDERING IRON LAMP: J. Westhead.—A hollow or trough-like iron lamp, its two sides brought to a point at its outer end; at the outer end a socket set at an angle, the socket being fitted on the nozzle of a benzoline lamp preferably of the "wedgie torch" type; the cavity of the trough-like iron lamp being utilised to hold a quantity of molten metal or solder in running pipe joints are being made.

1,898.—WATER CLOSETS AND FLUSHING APPARATUS: Clay.—The basin's outgo is at its back, which has an eight plane surface rounded at the corners to meet the slope of the basin bottom determines the depth of

the syphon trap's dip, and a flushing rim and fan spreader discharge the flushing water at the front and down the back of the basin; it is claimed that this form of basin is independent of the position of the branch soil-pipe, and admits of the trap ventilating pipe being attached to the branch soil pipe close up to the end of the out-go without interfering with the syphon discharge.

8,344.—BRAZING JOISTS: D. Crouther.—The invention consists essentially in combining with any brazing metal in one piece to fit or surround the joint as so applied as to form part of the brazing piece, whereby, when the heat is inserted in or placed on or between the joint, heat can at once be applied for fusing and brazing, the proportion of flux necessary to ensure the flow of the metal when fused being contained in or on the brazing piece, and not having to be supplied by hand.

9,698.—FOR STARTING THE SYPHONS OF FLUSHING CISTERNS: W. B. H. Drayson.—The syphon's short leg is constructed with its circular segmental part either in one piece or connected thereto; the bearings for the axis of the plunger or piston are fixed on the lower part of the short leg or on the segmental part, instead of being attached to the cistern or separately from the syphon; the cistern can be made with a recess for receiving the short leg's segmental part, whose mouth may stand somewhat below the bottom of the cistern in order that the cistern may be quite emptied at each action of the syphon.

10,599.—RED OXIDE: T. T. Still.—This relates to the residue of red oxide from the waste liquors of galvanising works, in-plate works, wet copper process or other residual waters containing iron in the form of chlorides; the improvement consists in precipitating the same with milk of lime or other suitable material so that there shall always be an excess of iron, in oxidising by driving off the moisture with full exposure to the air and at a low heat, and in washing the ferrous hydrate free from soluble salts before furnacing. The spout liquor or pickle containing free hydrochloric acid is put into vats and treated with scrap iron to neutralise the free acid and increase the yield of oxide.

11,445.—TEMPORARY METALLIC ROOFING FOR HAVILAND AND THE LIKE: J. E. Lilley.—A light wooden framework is constructed over the ridge, and upon the framework is fixed a roof or covering in sectional sheets of light metal, such as corrugated iron; the sheets are affixed to the rafters and to one another by sharp-pointed eye-bolts hammered in, and then screwed home by any rod or pin.

11,476.—MAKING JOINTS: J. Birtwaile.—The method consists in making a key-hole, or key-hole, in the end of the tube and socket and in injecting therein the molten metal, or alloy or other suitable substance, which enters and fills the channels, cavities, grooves, &c., which form the key-holes.

11,903.—BRICK PRESSING: H. Alexander.—One end of a rocking beam is connected to the free end of a link; the link's opposite end is fulcrumed to the frame of the machine, and the pivot of the connecting rod and link is connected by a rod to a crank rotated by the power. The rocking beam's opposite end is connected to a top plunger, in which a panel may be made; the beam's up and down motion gives a short double movement at the end of its stroke, and so imparts a double pressure to the top plunger. When the beam returns to its up position, the top plunger is raised, and so the bottom plunger is raised by the lifting of the ordinary way. For making a panel in the brick's underside, the lower plunger is made with an internal plunger supported by levers held upwards by an adjustable spring attached to the framework, and fulcrumed to the lower plunger in such a manner that, on the latter being depressed, the internal plunger rises therein, and forces a panel or indentation in the lower side of the brick.

12,070.—MANUFACTURE OF CEMENT: T. Holden.—The materials are used dry, being reduced to a fine powder without the addition of water, and the powder is transferred to the kiln, and "set" between layers of fuel, the layers being connected with each other by forming columns or portions of fuel at intervals through the layers of powder.

13,024.—WASTE FITTINGS FOR SINKS AND THE LIKE: A. Russell.—A combined cut-off and strainer has (a) a strainer plate, in which are a series of radial openings, and (b) an oscillatory or slide cut-off disc, with a series of radial openings, which register with the openings in the strainer plate; thus the escape of water from the sink, and of sewer gas, &c., from the sewer or trap, can alike be prevented.

13,891.—374.—CISTERN BALL-TAPS: O. H. Wagner.—The rise and fall of the ball imparts a circular reciprocating action to the plug by means of rollers placed in angled slots of the barrel neck.

14,250.—SHOWER BATHS: H. Hauser.—The reservoir, preferably of glass, and graduated, is held in a frame and can be raised and lowered by a drawing rope passing over a pulley at the top of the frame and winding on an axle worked by hand; the apparatus may be used apart from a bath, and may serve for hospitals, infirmaries, manufactories, and the like.

9,148.—HOLLOW GLASS BLOCKS FOR THE CONSTRUCTION OF WALLS PREVIOUS TO LIGHT: The Glashütte-werke Aktien-Gesellschaft of Penzig.—To obviate the casting of a shadow by the band of mortar, and the filling out of the glass bricks, the outer surfaces of the bricks are fashioned with lens-like projections, which correspond lens-like depressions on the inner surfaces, thus is formed a set of contiguous concavo-convex lenses (whose bounding lines form a hexagon) which disperse the light and neutralise the shadow thrown by the mass, and the bricks are placed in a network of wire which lies in the hollows between the lenses at front and back.

2,532.—GLAZING BRACKS: W. Curstone.—The inventor combines iron or steel astragal (rolled or otherwise formed) and having a shouldered portion, with a soft metal clothing provided with wings or projections which form a resistance between the glass and the shoulders of the astragal; the astragal may also have a dovetailed or similarly projecting ridge on its under surface, and the glazing bars may be channelled for asbestos or other packing.

NEW APPLICATIONS.

For week ending March 26.

6,773, J. E. Stewart, Street Lanterns. 6,776, E. J. Masters, a Combination Tool for Carpenters, Joiners, and Kindred Trades. 6,781, J. & H. C. Dalglis, Enamelling of Baths and the like. 6,782, J. Murrie, Spouters, &c. 6,788, J. G. Kirtley, Pipe Joints. 6,790, H. Dearden, for Holding in Tension Window-blind Cords. 6,818, M. N. Shuffelbarger, Automatic Railway Switches. 6,823, J. Clark, and other Ovens. 6,835, W. G. Wood, Electric

Miners' Lamps. 6,838, P. Sohège, Expandable Pulleys, &c. 6,840, C. G. Nilsson, Heater with Air Circulation. 6,853, E. Dymont, Essels. 6,857, Harris & Petwell, Adjustable Jaws for Spanners, Vices, and the like. 6,859, W. G. Harris, Motor Engines. 6,864, C. Fischer, Parallel Vices. 6,865, J. D. Andrews, Electrical Connections. 6,868, C. Craig, Locking Joint or Rod. 6,875, A. Alexina M. Reid, Sink Protection. 6,892, Moody and Others, Brush Handle and Wood Spindle Fastener. 6,893, J. A. Willmore, Sheet Metal Lathing, and Machinery for making the same. 6,900, E. Davies, Stop Cocks or Valves for Water Supply Pipes. 6,925, Aldrich & Carr, Details of Electric Tramways and Railways. 6,926-7, Duckett & Son and Others, Water Waste Preventers, and Escape Traps. 6,933, Malpas & Allday, Moulding Machines for Sand and the like. 6,947, C. E. Whitney, Motive Power Engines for Road Vehicles. 6,950, W. R. Morris, Self-acting Motor. 6,953, S. Z. de Ferranti, and 7,055, C. F. de Kierzkowski-Stewart, Water Turbines. 6,959, W. J. Brewer, Flaming Breakwaters. 6,975, Beissbarth & Rieder, a Revolving Smoothing-iron. 6,989-92, E. Weston, Electrical Measuring Instruments. 6,994, J. Marsh, Flushing Syphon Cistern. 6,995, A. G. New, Reciprocating Engines. 6,998, J. Hammerley, Cooking Ovens. 7,000, A. R. Ferns, Forging, Sharpening, and Finishing Drills and other Tools. 7,013, R. G. Brooke, Heating Buildings. 7,019, J. L. Cuthbert, Apparatus for Taking Samples of Pulverised and Granulated materials. 7,027, S. G. Brown, Dynamo-Electric Generators and Motors. 7,047, Wigglesworth & Taylor, Combined Shower or Douche Bath and Vapour Bath. 7,054, T. White, Door Holder. 7,057, Proctor & Blakie, Plug Switches and Connections (Electrical). 7,059, Russell & Cottrell, a Road Scanner. 7,060, F. A. Colburn, Brushes. 7,071, C. Clayden, Hoods for Domestic and other Fire-places. 7,088, L. Morey, Fire or Burglar Alarm for Enclosed Places. 7,090, R. Bergner, Door Closing and Checking. 7,104, E. Lebedev, Drying, Hardening, Impregnating, and Dyeing Wood. 7,126, J. G. Chadwick, Window Fasteners and Draught Excluders. 7,128, A. Smith, Sliding Sash Frames. 7,135, F. Beyer, a Wall Plug. 7,143, M. B. Church, Compounds for Coating Walls, Ceilings, or other Surfaces, or for Mouldings, Modelling, or the like. 7,150, Todd & Harker, an Electric Locomotive. 7,151, A. McQuade, treating Leather with Paper or Wood Pulp, Sawdust, &c., for the Production of Imitations of other Substances. 7,155, G. Knowles, Ventilation of Buildings, Chimneys, and Cakes. 7,163, W. Gaines, Hinges for Doors, Gates, &c. 7,164, F. B. Herzog, Electric Signalling. 7,170, P. Germain, Telephone Posts or Stations. 7,198, E. W. Barton, Ventilating Rooms, Buildings, &c., and for Extinction and Fire Extinguishers. 7,213, S. G. Edwards, a Combination Tool. 7,217, T. Jones, Brick-making Machines. 7,221, T. Wilson, Chimneys. 7,231, Sykes & Harrison, Tools for Boring out Taps, Cocks, Tapered Holes, and Tubes. 7,237, E. Richmond, Gas-heated Water Heaters or Boilers. 7,240, C. H. Knight, a Lever for Bending Metal to form "Stair Nosings." 7,247, F. Appleyard, Ventilation of Rooms. 7,251, Hodge & Porter, a Combined Valve Cover and Joint for Pumps, &c., applicable to the Tops of Manholes or Removable Covers. 7,258, J. Morrison, Lavatory Basins and Sinks. 7,267, J. W. Butler, Magnesian Cement. 7,268, G. R. Geiser, Instrument for Ascertaining the Centres of Gravity of a Circle to which Sides of an Angle are Tangential at given points. 7,284, T. & J. Burgess, Catches, Fastenings, and other Furniture for Windows, Doors, &c. 7,297, R. Stanley, Machinery for Moulding, Pressing, and Delivering Tiles, Quarries, Bricks, &c. 7,323, Tanner & Lowcock, Safety Device for Hoists and Lifts. 7,324, W. Schmidt, a Wire Rope "Stopper" or "Grip." 7,340, A. H. Crawford, a Fireproof Floor. 7,356, W. Joy, Portland Cement. 7,394, Parkes & Wagner, a Screw-down Tap.

SOME RECENT SALES OF PROPERTY:

ESTATE SALE REPORT.

March 23.—By Dacre & Son (at Pudsey).
Pudsey, Yorks.—"The Froydale Farm," 77 a. 1 r. 13 p. 1/2. £2,400
March 24.—By C. C. & T. MOORE.
Barnesy—21 and 23, Repton-st., c. 434 ft. 495
Stoke Newington, Essex.—30 and 32, New-rd., f. 1, 484 sq. 525
By NEWBORN, EDWARDS, & SHEPHERD.
Clerkenwell.—3, Newcastle-pl., f. 1, c. 100 ft. 1,500
Holloway.—265, Camden-rd., u. 594 yds., g. r. 134, 128, 60, c. 200 ft. 2,000
Stoke Newington.—134 and 136, Albion-rd., f. 1, 130 ft. 2,400
Islington.—46, Gerrard-st., u. 453 yds., g. r. 61, f. 45 ft. 410
27, Cloudestey-st., u. 182 yds., g. r. 24, c. 50 ft. 375
Holloway.—38, Wray-cres., u. 67 yds., g. r. 61, c. 60 ft. 525
3, Despard-rd., u. 86 yds., g. r. 51, f. 28 ft. 400
135, Blackstock-rd., u. 69 yds., g. r. 61, 66, r. 40 ft. 360
Dalston.—76, Grafton-rd., u. 61 yds., g. r. 51, c. 40 ft. 440
Clapton.—64 and 78, Reighton-rd., u. 83 yds., g. r. 134, 108, r. 58 ft. 600
By STIMSON & SONS.
Newington.—145, Newington Butts, and 1 to 11 (odd), Hurlbutt-pl., f. 1, r. 166 ft. 3,000
Lambeth.—93, Lambeth Palace-rd., u. 11 yds., g. r. 61, c. 65 ft. 230
Walworth.—20, 22, and 34, Deacon-st., u. 48 yds., g. r. 171, r. 137 ft. 910
127, Walworth-rd., u. 554 yds., g. r. 201, c. 585
1 to 9 (odd), Dean's-bldgs., f. 1, r. 105 ft. 65, 1,000
Fulham.—King's-rd., i. g. r. 121, u. 548 yds., g. r. 37 ft. 180
Walthamstow.—1 to 9, 13, 13 and 15, Mission-grove, u. 89 yds., g. r. 54 ft. 1,780
Pimlico.—Cambridge-st., f. g. r. 15, reversion in 29 yds. 185
Dulwich.—Hornlow-rd., f. 1, r. 37 ft. 560
Kentish Town.—Prince of Wales-rd., i. g. r. 554, u. 124 yds., g. r. 126 ft. 315
By WAGSTAFF & SONS.
Hornsey Rise.—Nos. 37 and 39, u. 17 yds., g. r. 91 ft. 475
Highbury.—67, Highbury New Pk., u. 52 yds., g. r. 151, c. 120 ft. 990
Holloway.—19 to 25 (odd), Hercules-rd., u. 54 yds., g. r. 21 ft. 870

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Prize.	Designs to be delivered.
Water Supply Scheme	Cricklade and Wotton	211, 104, 106.	April 20
Technical School	W. B. W. R. D. C.	400, 300, 200.	May 28
Chapel, &c.	County Boro of Salford	200, 100, 50.	June 7
Sewage Scheme	Parochial Com.	100, 50, 25.	July 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Sanitary Works at Workhouse Infirmary	Belfast Union	Young & Mackenzie, Engr.	April 12
Road Works, Widdowood, &c.	Cardiff Corp.	W. B. W. R. D. C.	do
Additions to School, Oswaldtwistle, Lancs.	Committee	W. B. W. R. D. C.	do
Pumping Station, &c., at Widdowood	Rye T.C.	W. B. W. R. D. C.	do
Laying Cast Iron Water Main	do	W. B. W. R. D. C.	do
Sewage Purification Works	do	W. B. W. R. D. C.	do
Paving Bricks, &c.	Chew T.C.	W. B. W. R. D. C.	do
Road Metal	Staffs. C.C.	W. B. W. R. D. C.	do
Road Materials	Rowley U.D.C.	W. B. W. R. D. C.	do
Outfall Sewer near Feth Harker	Perthburgh Commr.	W. B. W. R. D. C.	do
Club and House, Hixthorpe, near Doncaster	Farnham Union	W. B. W. R. D. C.	do
Re-tiling Farm House, &c., Hillhead of Glack, Aberdeen	do	W. B. W. R. D. C.	do
Laundry at Workhouse	do	W. B. W. R. D. C.	do
Additions to Victoria Mills, West Vale, Halifax	Whitehaven & S. D.C.	W. B. W. R. D. C.	do
Sewage Works, Dittington	Canook (Staffs.) B.D.C.	W. B. W. R. D. C.	do
Dwelling House, Trawsile, Probus, Cornwall	Ryton-on-Tyne U.D.C.	W. B. W. R. D. C.	do
Road Materials	Oliverston U.D.C.	W. B. W. R. D. C.	do
House, Colbrook, Aberystwyth	Cheshire - In - Street	W. B. W. R. D. C.	do
Cast Iron Water Pipes, &c.	Halifax Brewery Co.	W. B. W. R. D. C.	do
Alterations to Buildings, Museum Court	G. Fuller	W. B. W. R. D. C.	do
Sewage Works, Lece	Aldershot Gas & Water	W. B. W. R. D. C.	do
Brewers, Washington, Durham	J. J. Robinson	W. B. W. R. D. C.	do
Additions to Brewery, Cotehill, Burnley-road	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Dwelling House, Cotehill, &c., Upper	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Numerous	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Addition to House, &c., Newton	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Frame Bridge and Incline	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Alterations to Turf Hotel, Stockton	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Concrete Galleries, House, &c., Crowdon, Manchester	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Sewage Works	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Wesleyan Church, Orlestone, Great	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Yarmouth	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Road Materials	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Reconstruction of Drainage System	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Borough Asylum	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Club Premises	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Four Cell Destructor Plant	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Concrete Footpath, &c.	W. B. W. R. D. C.	W. B. W. R. D. C.	do
New Quarters for Nurses	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Iron Water Tower, Sanitary Fittings	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Alterations, &c., &c.	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Granite	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Bakery, Gillingham-road	W. B. W. R. D. C.	W. B. W. R. D. C.	do
New Board Room and Offices	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Road Works, Walnut Tree Close	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Iron, Concrete, and Stoneware Pipe	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Cast Iron Sewer Ventilating Columns	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Laundry Buildings	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Water Supply	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Road Making and Paving	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Sewage Works, Regent-road	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Six Houses and Thirty-seven Cottages	W. B. W. R. D. C.	W. B. W. R. D. C.	do
Shed	W. B. W. R. D. C.	W. B. W. R. D. C.	do

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Boring Works, L'card, Cheshire	Wallace U.D.C.	J. H. Crowther, Engr.	April 21
Sewage Disposal Works	L'ford U.D.C.	W. B. W. R. D. C.	do
Refining Wall, Gibbon-street, Holt	Marshall's Corp.	City Surveyor, Town Hall	do
Shipbuilding Ship	Sheffield Corp.	Dr. R. Anderson, Archt.	do
Fire and Police Station	Sheffield Corp.	Dr. R. Anderson, Archt.	do
Alterations to Asylum, Reasby, near Easingwold	Board	Dr. R. Anderson, Archt.	do
Laying 21 miles 12 in. Pipes	Newmarket Waterworks Co. Ltd.	Dr. R. Anderson, Archt.	do
Steel Girder Bridge over Irwell, Pad	Salford Corp.	Dr. R. Anderson, Archt.	do
Paving Works	St. Luke's Vestry	Dr. R. Anderson, Archt.	do
Lock-up, Norton Woodside, near	Standing Joint Committee	Dr. R. Anderson, Archt.	do
Agricultural School, Newport, Salop	Governors, Harper Adams Foundation	Dr. R. Anderson, Archt.	do
Rebuilding, Channelling, &c., Roadway	Canavan Corp.	Dr. R. Anderson, Archt.	do
Girder Bridge over River Seiont	Sheffield Corp.	Dr. R. Anderson, Archt.	do
Steel Bridge Three Spans of 55 ft. each	Newcastle Breweries, Ltd.	Dr. R. Anderson, Archt.	do
Re-building First Inn, Wyllan-on-Tyne	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Church Institute, near Cleithorpe	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Stone Building, Glosop	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Business Premises, High-street, King's	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Villa, Robin Hood's Bay, Yorks.	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Synagogue, London, E.	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Church, Westwood, Notts.	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Additions to Bunchworth House, near	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Monastery, Clonard, Belfast	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Tower, Christ Church, Fenton	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Business Premises, North-road, Mid	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Friends Meeting House, High-street,	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Factory, Bristol	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Repairs to Gasworks, &c.	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Roads and Drainage Works, Barry	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Eight Houses, Avenue-st., Allerton,	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Fourteen Houses, Ashton-under-Lyn	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Two Villas, Pollard lane, Bradford	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Business Premises, Howard-street	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Two Houses and Shop, Thorne, Herts.	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Laundry, Cork	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
House, &c., Brignall, near Barnard	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Cattle	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Priest's House, Clons, Ireland	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Protestant Church, Harehills, Avenue, Leeds	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Farmlands, &c., Brignall, near Barnard	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Machine Shop, &c., Harehills-on-Tyne	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Drainage, Curbing, Paving, &c., about	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
three miles of road	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do
Reconstruction of Drainage at Asylum	W. B. W. R. D. C.	Dr. R. Anderson, Archt.	do

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
Assistant Surveyor and Building Inspector	Litterland (Leuca) U.D.C.	1100.	April 12
Manual Training Instructors	Reh. Bd for London	See Advertisement	April 12
County Surveyor	Midleaze C.C.	7000, a year, rising to 8500.	May

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. 17. Contracts, pp. 17, & 18. Public Appointments, pp. 17, & 18.

By WATT & SON (at Angmerling)
Angmerling, Sussex.—High-st., seven plots of building land, f. 504. £514
High-st., a freehold cottage, f. 504. 125
By HAYWARD & SONS (at Leeds)
Leeds.—140, 148, and 150, Burley-rd., f. r. 556. 10s. 1,072
By WATERER & DICKINS (at Bromley)
Downe, Kent.—Bromley-rd., six freehold cottages, r. 574. 2s. 800
Farnborough-rd., two freehold houses, e. r. 504. 700
Cross-rd., &c., 46 plots of land, f. 1,602
March 25.—By F. DON & CO.
Wood Green.—Mayes-rd., f. r. 106, reversion in 51 yrs. 250
106, Mayes-rd., e. r. 654 yrs., e. r. 56. 250
Stoke Newington.—1, Stoke Newington Common, e. r. 751 yrs., e. r. 75 yrs., e. r. 504. 435
By Messrs. GINSON
Holloway.—36 and 38, Yerbury-rd., e. r. 69 yrs., g. r. 64, r. 744. 765
Leighton.—1 and 2, Smith's-bldgs., f. r. 456. 700

By J. HIBBARD & SONS
Clapton.—34 and 36, Powell-rd., f. r. 704. £1,115
Rotherhithe.—12 and 14, Cornbury-rd., e. r. 77 yrs., e. r. 104. 370
Hornsey.—1, e. r. 282. 270
By JONES, LANG, & CO.
City of London.—Farringdon-rd., e. r. 254. 4s. 6,375
Enfield.—Nag's Head-rd., a plot of building land, 14 a. f. 800
Putney.—51 and 53, Wether-rd., e. r. 76 yrs., g. r. 174. 10s., r. 904. 750
24, 26, and 34, Oxford-rd., e. r. 80 yrs., e. r. 274, r. 1954. 1,795
By SEDGWICK, SON & WEALL (at Rickmansworth)
Rickmansworth, Herts.—High-st., "The Elms," e. r. 15 a. f. r. 1564. 2,750
Church-st., The Town Wharf Estate, area 12 a. f. 3,120

Harefield, Middx.—"Taylor's Meadow," 12 a. r. 15 p. f. 1,115
March 28.—By NOKES & NOKES
Catford.—8, Nelgarde-rd., e. r. 90 yrs., g. r. 76, e. r. 404. 370
Kenilworth.—22, Hedley-st., f. r. 404. 270
Stroud Green.—9, Mount Pleasant Villas, e. r. 774 yrs., e. r. 64, r. 454. 800
Wandsworth.—Luscombe-rd., e. r. f. r. 824. 10s. 363
1d., reversion in 154 yrs. 363
By EASTMAN BROS.
Forest Hill.—76, Horn Oak-rd., e. r. 234 yrs., g. r. 264, e. r. 1004. 750
By HENRIOTT, SON & BOYTON
Cavendish-sq.—6, Henrietta-st., e. r. 28 yrs., g. r. 104. 270
By J. H. HARRIS
Theydin Bois, Essex.—Piercing Hill, "Purlic," e. r. 2 a. f. 270
and about 2 a. f.

[illegible]

LONDON.—For the erection of wand blocks at workhouse Northumberland-street, W., for Mr. J. Marylebone Union Guardians. Mr. A. Saxon Small, architect, 22, Southampton-buildings, W.C. Quantities by Messrs. Norton & Son, & Neighbour. G. H. & A. Bywaters & Sons, Regent-street, W. (for completing within twelve months). £51,492
(Nine other tenders received.)

LONDON.—For alterations to the "Queen's Arms" public-house, Portland-street, Waltham, for Miss Maud Mills. Messrs. Lawson Bros., architects. W. Newstead. £483 Star & Sons. £448 H. James, Peckham. 448. * Accepted.

LONDON.—Accepted for setting boilers and other works at "The Hotel," Holborn. C. Yates & Co. £352

LONDON.—Accepted for setting boilers and other works at the First Avenue Hotel, Holborn. C. Yates & Co., Bow. £352

LONDON.—Accepted for setting boilers and building boiler house, &c., at Messrs. Barnes & Co., Chemical Works, Hackney Wick. C. Yates & Co., Bow. £295

LONDON.—For pulling down and rebuilding the "Three Jolly Bunches," Wood Green, N., for Mr. J. Watson. Mr. J. E. Fidler, architect, Bridge House, South Tottenham, N. Amell & Co. £64,922 H. Knight & Son, Tottenham. £4,783 tenham. £13,166 Valer. £4,541 Deering & Son. £2,960 Johnston & Co. £2,541
* Accepted subject to modifications.

LONDON.—For pulling down and rebuilding "The White Hart," Mill End-road, E., for Messrs. Hoare & Co. Ltd. Messrs. Perry & Reed, architects, John-street, Adelphi, W.C. Farman & Rathenham, 27, 29, Clarke & Gracey. £7,409 H. Biddall, & Co. 7, 8, 9 Knight & Son. 7, 374 Dove Street. 7, 407 Perry & Co. 7, 293

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English Renaissance Architecture.



RENAISSANCE architecture in England, to which so much attention has been directed, and of which so many imitations have been made, since what one may call the decline and fall of the Gothic revival, is only one corner of the great architectural development which followed on the revival of learning. Its productions have never rivalled the refinement and stateliness of Italian Renaissance, or the richness of the French Renaissance. But it is especially interesting to us, not only as being our own, but because it arose and developed under various and to some extent conflicting influences, partly of circumstances and partly personal, with the result that it displays a greater variety of method and taste, in the course of its history, than is to be found in the architecture of the same period in any other country.

Mr. Blomfield, in the large book on the subject which he has recently completed,* and which has evidently been the work of some years of study, has aimed at giving both a history and a critical analysis of English Renaissance architecture, of the various forms which it assumed and the causes which acted upon it. We have various publications illustrating our Renaissance architecture; but the present work, though crowded with illustrations (of which the great majority are from the author's own sketches), is a great deal more than either a history or a book of examples; it is a philosophically written treatise going into the causes of things and the reasons for approving or disapproving of them; treating ancient examples of architecture from the point of view of abstract reasoning, and not as works claiming admiration and imitation on merely archaeological grounds. Books dealing with the history and illustration of ancient architecture in this spirit are unfortunately not very numerous; one may be glad to welcome an important addition to the list; and no one, we think, can go through Mr. Blomfield's

book, whether or not he agree with all the opinions expressed in it, without feeling that he has gained at all events a new and comprehensive classification of an intricate subject.

One distinction between the Renaissance in England and in continental countries is of course the later period of the start, naturally arising from the isolated position of this country in days when intercommunication was so much more slow and difficult than it is now, and perhaps partly from a conservative and insular clinging to our older national forms of architecture. Mr. Blomfield classifies the history of the subject under three main epochs; (1) the period of the Italian artists in England under Henry VIII.; (2) that of the English masons and builders, when architecture was carried out at the bidding or inspiration of wealthy *dilettanti*, who gave general orders and exhortations to masons and joiners who got details out of pattern-books—and in this period he includes also the work and influence of German and Flemish artists in England, which was prominent during the reign of Elizabeth; and (3) the period commencing with Inigo Jones and the actual study of Italian Renaissance architecture in a scholarly spirit. We should be disposed to add a fourth period, that of personal influence, which commenced with Wren and ended with the Adams. Mr. Blomfield attaches an immense importance, as we shall see, to the personal influence of Inigo Jones, and in one sense we agree with him. But we do not regard Jones as being so much an inventor in architectural design as Wren; he was rather concerned in showing how Palladian architecture might be correctly and properly adapted to English buildings, in a refined and scholarly form, in place of the rather crude performances of the English masons and the German carvers; he was no doubt an original genius of a high order, but so far as he had the opportunity of carrying out important buildings he subordinated his originality to Palladian principles. We quite concur with the author as to the power of handling and the sense of proportion shown in the Tuscan portico in Covent Garden; but still, that was the successful working out of a school ideal, not of an original conception. In his designs for masque scenery he probably showed a daring originality, to judge from some of the

designs which have been preserved, but these were temporary structures. With Wren we come upon an architect who, with less of Italian refinement in design than Jones, showed an extraordinary capacity of personal invention in architecture, and erected many buildings of which it may be said that each, though carried out with the same class of detail as the rest, is a distinct and original architectural conception, owing nothing either in plan or general design to classic or Italian precedent. And from the time of Wren to the close of the Renaissance period in this country, we find a succession of prominent architects each of whom had his own independent way of treating classic materials. Hawksmoor, who was Wren's chief pupil and follower, was as original and inventive as Wren, as far as he had the chance of showing it; Vanbrugh, less varied, at all events unquestionably made his own architectural treatment, and a very marked and striking one; Gibbs and Chambers, though less original and in every way much smaller men, had their own methods; and Robert Adam, also a much lesser light than the great men of the seventeenth century, had enough originality to evolve a kind of style of his own, and enough personal power to impose it on a whole generation. If Mr. Blomfield takes a review of his own pages, we think he will recognise that there is this distinction—in the pre-Jones period it is a history and illustration of work done, of which it is difficult to name the architects; in the post-Jones period it is the history and illustration of the work of personal architects each with his special idiosyncrasy. He suggests indeed a fourth division of his subject—buildings which cannot be exactly identified either with Gothic or Renaissance, but represent "the continuous building tradition of the country." The kind of buildings to which he refers—mostly farmhouses and small country houses—are very interesting and in a sense peculiarly English, but we do not see what they have to do with English Renaissance architecture. They do not admit of being classified under the title of the book. Therefore we should amend the classification thus:—

1. The various isolated attempts of foreign workmen, mostly Italians, to introduce their own method of workmanship.
2. The efforts of half-instructed native builders, and of Flemish and German workmen.

* "A History of Renaissance Architecture in England, 1500-1800." By Reginald Blomfield, M.A. London Geo. Bell & Sons. 1897.

3. The mature Palladianism introduced by Inigo Jones.

4. Wren and the personal designers.

The first three classes are as the author puts them, the fourth we should substitute for his fourth term. Inigo Jones undoubtedly prepared the way for Wren and his successors, but they worked in a different spirit from his.

Under his first head the author has collected a great deal of information as to the Italian artists who worked in England, and whose incursion was largely due to the taste and ambition of those two magnificent amateurs of art, Henry VIII. and Wolsey; but his main point in regard to them is that they were not architects and did not much influence the architectural development; they were employed on monuments or decorative adjuncts to buildings which still retained the Mediæval style; hence the curious and picturesque alliance of Renaissance decoration with Late Gothic detail. There could hardly be a better example of this than the ornament over the gateway at Montacute House (fig. 1),* in which the treatment of the coat-of-arms and the supporting figures is so exceedingly Italian in feeling, while the framework of the panel and all the other architectural features are distinctly Gothic. The retirement of the Italians after the death of Henry may, as the author suggests, have been in a great measure due to the fact that his expenditure had drawn in its train a re-action in favour of economy, partly for the excellent reason that there was no more money to spend. The author considers that the Germans took their place in Elizabeth's time. There are names enough extant of German artists employed in England at the time to give plenty of colour to this view; but we should suggest that a good deal of the work which Mr. Blomfield attributes to German hands—"the strapwork gables to the towers of Wollaton, . . . the shapes of men and women ending in balusters, all show the heavy hand, the merely mechanical instinct of the German workman," &c.—was really executed by English workmen influenced by German taste. The German invasion accounts for such details as the strapwork which became such a favourite form of ornament in the Elizabethan period, and ran such riot at Wollaton Hall; but the page of ornament which the author quotes from Vriesse's "Architecture," though it may indicate the origin of some salient traits of Elizabethan ornamentation, has a very different appearance and feeling from anything that we are accustomed to see in actual execution in Elizabethan work, so that we are inclined to think the actual practical intervention of the Germans has been exaggerated.

In speaking of "The English Builders" the author is sceptical, like many other persons, as to John Thorpe's claims to many of the buildings often assigned to him, and in fact considers him as much an *ignis fatuus* as "John of Padua." He at any rate shows that the positive evidence connecting Thorpe's name with any but two or three buildings of secondary size and importance, is entirely wanting. Considering that both Kirby and Wollaton Hall have been confidently attributed to the mystic Thorpe, the reply is very obvious, that in those days

* The illustrations here given are not from the original blocks, but reductions to suit the width of our columns.

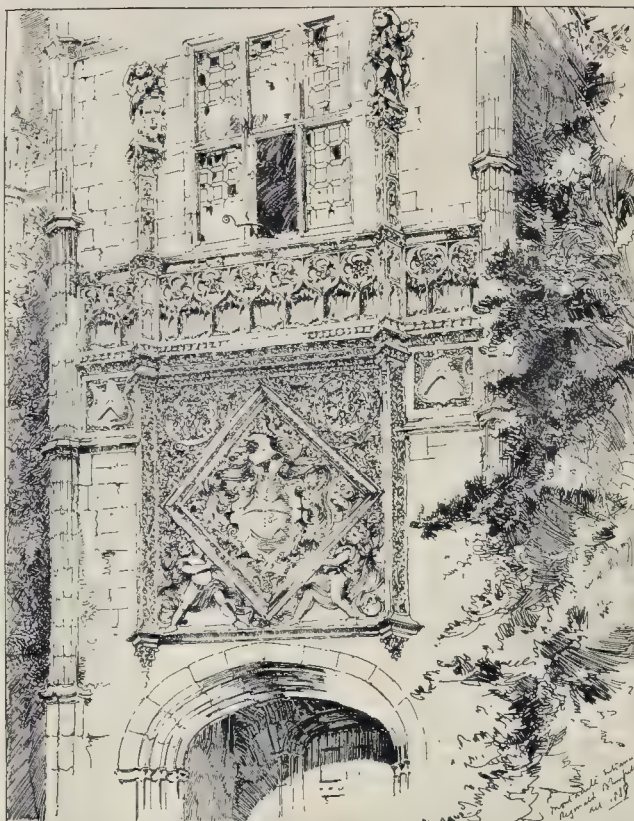


Fig. 1.—Gateway, Montacute House.

it was hardly possible that the same man could have designed two buildings so radically dissimilar in their architectural treatment; and we are inclined to accept Mr. Blomfield's verdict, that Thorpe was probably only an example of those not very much educated master-builders or surveyors who took in Elizabeth's reign the place and functions of architect. We do not know why the author speaks so slightly of Wollaton; the style, with its profusion of artificial ornament, is certainly not of the best, but we cannot agree that it is a building to be despised. Among the illustrations to the chapter on the English Builders we may take the sketch of the School and Almshouse, Corsham (fig. 2), though no name of architect or builder is suggested for it, because it is a good representation of that half-and-half Renaissance architecture which consists in affixing a decorative framework of Renaissance detail to the principal doorway, with no reference to anything else in the architectural design, which retains a naïve Late Gothic character. Our taste has got used to this kind of incongruity by force of habit, but if we were to stumble for the first time on a building so treated, it would probably strike us as very odd, and we should be tempted to think that the door decorations were a later facing to the entrance wing, not done at the same time as the entrance wing itself. It is impossible to judge of such a point

except from the actual building, but the sketch seems to show that this whole wing, at all events, was built at one time. But this kind of thing was now to be superseded, and the mason-architects pushed on one side by a stronger hand.

Though the author brings forward plenty of evidence to show that, in the days immediately previous to Inigo Jones, there was no one employed on buildings whose function answered to that of architect as designer in the modern sense, he does not make use of this fact to prove that the architect is a pernicious person and the cause of the decline of architecture, as we have often heard of late. On the contrary, he introduces Inigo Jones in words which seem to point to him as the regenerator of our architecture:—

"He returned to England filled with the very spirit of the great Italian artists of the Renaissance, and lifted the art of his country into an altogether different plane. The homely fancy, the lovable humility, as one might say, of its traditional art were laid aside; the art of this country was to be no longer an affair of happy instinct, but completely conscious, dependent upon scholarship almost as much as on capacity of design. Henceforward abstract thought, and imagination under rigid restraint, were to supersede the poetry of mediæval fancy."

We are so little accustomed to this tone in the writings of architects of the new school (with which we suppose we must class Mr. Blomfield) that one is rather taken by sur-



Fig. 2.—School and Almshouse, Corsham.

and may even doubt if the author does so too far if he means to imply that it gains in any sense that architecture should be "dependent on scholarship almost such as on capacity of design." And we question whether it is quite true, as indicating the future course of Renaissance architecture in this country. In the case of Wren all events the capacity for design, in the old sense, was more notable than the scholarship, and the same might be said of Hawksmoor and perhaps of Vanbrugh. So far, however, as architecture was to be dependent on the use and application of antique forms and details, scholarship was no doubt a necessary condition of success; it had been notably lacking in the Renaissance architecture of the previous generations in England, and Inigo Jones laid the foundations for a sustained and dignified style; but the manner in which it is put in the passage quoted is liable to be a stumbling-block to the weak. The real point in Inigo Jones's reform is better indicated a few years before, in the remark that he was the first English architect to realise that if justice was to be done to Italian architecture, "plan and elevation must go together as a harmonious whole," in place of the previous habit of introducing into a building a piece of mere ornament, as in the case of the Temple, derived from Italian sources, and rarely added as a kind of mark of architectural taste. In this sense Jones did "lift English architecture into a new plane," and doubt Wren was much indebted to him in showing the way to a homogeneous treatment of Classic design. And yet we can only say that it is in that quality that the greatest merit of Wren consists; and one can even fancy that if there had been no

Inigo Jones, Wren would, with his multifarious invention, have done something even more interesting and picturesque with his numerous churches, on the basis of the old unchartered freedom of design, than on the basis of scholastic design. But he would hardly have achieved St. Paul's; he might have produced a cathedral more picturesque in parts, with more interesting detail, but he would not have realised that dignity which is its salient quality, and which makes us forget the bad detail. So far, Inigo Jones was his architectural master.

It may be true that Inigo Jones, as Mr. Blomfield says, was "the greatest architect that this country has ever produced"; we are inclined to think that potentially he was; but the claim to pre-eminence rests rather on his important influence on English architecture, and the impression which isolated specimens of his work convey, of his knowing exactly how to handle his materials and to do the thing in the best way, than on what he actually accomplished. And after all, had he instead of Wren inherited the *tabula rasa* left by the fire of London, would it have been the better for English architecture? We should have had more of scholastic correctness and more refinement of detail and proportion, but would it not have been Palladianism in, a second edition—an Italian yoke on the neck of our own architecture? A certain degree of idolatry has been developed in recent times in regard to Jones's work; there is a glamour about his name, his picturesque and forceful personality, his new learning in art. Is the Banqueting House fragment, after all, so remarkable a piece of work in itself as the followers of the Jones cult would have us take it to be? It is a portion of what would

have been a remarkable and a grand architectural scheme if completed, but it was a grandeur to be judged of by the whole rather than by parts; and we cannot see that this would be regarded as so remarkable a fragment but that it is known to be a portion of a great scheme by Inigo Jones. And then there is the question—how far is even this fragment really left as Jones built it?

We have reproduced Mr. Blomfield's sketch of the front of Raynham Park (fig. 3) as an example which he believes to be authentic, of Jones's quieter and less classic manner, and which is a very pleasing instance of the effect of simple symmetrical treatment and good proportion of parts—all except the gables, which strike us as quite unworthy of Jones's reputation for refinement of detail; the scrolls at the side are completely out of scale with the rest of the detail, and the pediments far too obtrusive and pronounced in their projection. These details are much more like the kind of work which the author has been attributing to the German workmen than to an architect who was supposed to specially represent Italian culture, and so far as they are concerned, the design is at variance with what the author and other Jonesian critics have invited us to regard as the special quality of Inigo Jones's design. Is it really his, after all?

The work of Jones's pupil Webb, and one or two others of his immediate followers, forms an interim chapter, both in reality and in Mr. Blomfield's scheme, between him and Wren, which we must pass lightly over here; only observing that the gate-pier from Amesbury (fig. 4), ascribed to Webb, and which the author stigmatises as bad in proportion, appears to us a very commendable piece of adaptation of Renaissance detail to a special position. A pier of this kind, which is no very large mass in itself, should have the appearance of weight and massiveness; and if an order was to be used at all in it, the use of it in stunted and massive proportions appears exactly suited to the situation.

The chapter on Wren, which concludes Mr. Blomfield's first volume, is a very thoughtful piece of criticism, and the author puts very well the general truth about Wren's peculiar genius and career, in remarking that he grew to be an architect of first-rate genius by unwearied labour and indomitable effort after a high ideal. This is just the truth. Wren was not by nature a man of specially artistic temperament, but he had the practical root of architectural power in him, in his specially scientific and constructive turn of mind, and the æsthetic side of his intellect was developed by the great and exceptional opportunities he enjoyed, and his anxiety to turn them to the best account. Refinement of taste was not his strong point, a fact sufficiently indicated by his monstrous rejected design for St. Paul's—not that of which the model is now in the Cathedral, but the one, on the same general plan, with the gigantic needle on the top of the cupola, which itself is carried on the main dome. Mr. Blomfield endeavours to suggest that Wren could never have seriously intended this; that it was a design made to catch the vulgar eye with the intention of eluding it afterwards; but this is too far-fetched. It does indeed seem strange that the architect who could afterwards evolve so fine and harmonious a design as the present dome should ever have



Fig. 3.—Entrance Front, Raynham Park, Norfolk (see page 365).

conceived such a thing as the abandoned design; but it is in keeping with the view already referred to, that Wren achieved architectural design by study and practice rather than by original artistic genius. This is strikingly illustrated again in the intermediate stage of the design shown in the All Souls College elevation, where the dome and western towers are set out nearly in their present mass and proportions, but where the western cupolas are so thin, poor, and rigid in design compared with the beautiful and picturesque design which they present as actually carried out. But even in regard to St. Paul's it is not well to be blindly enthusiastic. The exterior beauty of St. Paul's lies in the central dome and its colonnade, the western cupolas and portico, and the fine manner in which the dome and cupolas compose together. It is no use to deny, to any one who has unbiassed judgment to go upon, that the treatment of the lower portion of the exterior is tame, commonplace, and mechanical; the two nearly equal stages or stories, with their flat pilasters which seem merely *appliqué* features having no necessary connexion with the main mass, form a treatment which shows no sense of proportion, and suggests, to use Mr. Lethaby's phrase, the architecture of "a box of bricks"; and we cannot understand how any one looking at architecture from the point of view of an architect could fail to perceive this. But the fact is that most of the Wren worshippers of the present era are people who have parted with their critical faculty altogether (if they ever had any); they will have it that we must swallow Wren whole, defects and all; and it is a pity that a writer with much more critical insight than most of them possess should not have taken up a sounder position in this respect. It is the dome and the cupolas that really make St. Paul's what it is; and this fact is entirely in keeping with Mr. Blomfield's own estimate of Wren before referred



Fig. 4.—Entrance Pier, Amesbury.

to, and shows how his genius developed as the building went up; it began in a commonplace style, it ended sublimely.

The question of the legitimate employment of the inner and outer dome is more debatable, though Mr. Blomfield does not allow that it is debatable at all; he declares that it is the only way of forming a dome which shall be satisfactory both inside and out. There is something to be said for that, no doubt, in spite of St. Peter's. But the real defect in the case of St. Paul's, which Mr. Blomfield entirely ignores, is the placing above a timber dome a massive lantern of masonry, carried on the concealed cone, but made to appear as if carried by the outer dome which every

architect knows could not carry it. The lantern is in fact a piece of masonry construction rising through the timber dome just as a rock rises above the surface of the sea. That is not a monumental method of architectural design. What Mr. Blomfield means by his curious remark that "various amateur criticisms" have been made on the feature in St. Paul's we do not understand. As a general rule that is exactly the kind of point that amateurs fail to understand; Blomfield must be aware that such criticisms have been made upon it by people who are not amateurs; and in failing to recognise the objection to the appearance of carrying a masonry structure by a timber structure which could not carry it, he perhaps for the moment dropped a little much into the amateur attitude himself.

We shall have more to say on the subject of the later developments of the English Renaissance, more especially in reference to the interesting question, what more can be done with it from the present starting-point.

NOTES.

Few labour disputes are so far-reaching in their effects as a coal strike, and although an ordinary householder may not be inconvenienced by the stoppage in Wales, a great many industries outside the Principality feel its effects already. Apart from shipping, which is affected at the outset, there are many users of Welsh steam coal with contracts to run which will be indefinitely suspended, and the same applies to the engineering and other industries largely dependent upon Wales for foundry work. The conditions under which this strike has been entered upon, however, render unlikely that it will be very protracted. The dispute is entirely one of wages, the coal being too impatient to await the advance which automatically follows improved prices.

cover, they are dissatisfied with the sliding scale, and their leaders have been powerless to hold them in while the question was discussed. The prospect of a trade and high prices has induced some proprietors to agree to the terms demanded, the bulk of them are not prepared to put the basis proposed for a settlement.

THE number of sites in Greece marked by the discovery of "Mycenean" antiquities is daily on the increase. News comes from Athens that excavations, undertaken by the Hellenic Archaeological Society under the sanction of the General Ephor Philios at Mycenae, have been rewarded by the discovery of important rock tombs of prehistoric date, and corresponding in form and contents with those already known at Mycenae, Namplia, and Sparta. Three of these tombs are especially noticeable. The first contained a number of burnt bones, the second a trench with skulls, as well as numerous bones and gold ornaments of rose shape, four gold cups and two of Egyptian porcelain, the third contained a golden clasp and a bronze dagger. A noticeable point is that the tombs are connected by a trench hewn in the rock, the object of which is at present held to be uncertain. The importance of the discovery of these "Mycenean" tombs at Thebes is evident—Thebes and Argolis were from early days connected in mythology and legend; the missing archaeological link is now supplied.

WE regret to find that it is intended to demolish St. George's Church in Liverpool, a creditable specimen of Georgian architecture, which stands effectively at the junction of Lord-street and Castle-street, two of the principal streets in the city. Its removal will be a great detriment to the effect of Lord-street, but as its demolition seems now to be decided, perhaps for sufficient reasons, which we are not cognisant, we have only to notice here that the question has been as to what shall be done with the site, and an influential deputation led on the Mayor a few days ago to urge that the site should be retained as an open space. If the church is to go, this is the only thing that could be done, and a roundabout, as the French call it, with a fountain or monument in the centre, would be the best mode of substituting something in the way of a central architectural object after the removal of the church. The Mayor promised to present the petition to the Council, and assured the deputation that it would receive the respect which the importance of the matter deserved.

THE case between the Manchester Corporation, as plaintiffs, against Messrs. Perkins, Ham & Co., the contractors for certain works recently carried out in Manchester, which is being heard before Sir Benjamin Baker as arbitrator, appears, as far as the defence has yet gone, to present one of the most extraordinary and discreditable cases of scamping work that has ever come under notice; of that there can be no doubt whatever; who are responsible for it is of course a question which is *sub judice*, and which it would not be right to express

any opinion at present, nor has the evidence as yet gone far enough to enable us to form a decided opinion. The admitted fact is that a sewer which by the contract was to be carried out in two rings of brickwork, an inner one of blue bricks and an outer one of red bricks, was found to have been in many parts formed with one ring only, and in other portions the outer ring was laid dry without mortar. The Corporation, on discovering these facts, reconstructed the sewer themselves in the defective portions, and are now claiming to recover the cost of this from the contractors. The point towards which the evidence has been mainly directed so far is, as to whether the contractors were cognisant of and abetted this proceeding, or were only deceived by their employees. When the case is concluded we shall have more to say about it.

THE London Society for the Extension of University Teaching will hold their summer meeting at the University of London from May 30 to June 11. All the lectures—excepting those in the educational section, upon child-study and the history of education in London—will have London for their central idea: its geography, literature, history, records, and art. Courses are to be delivered upon "English Architecture, with Special Reference to London Examples;" "The Parthenon Marbles;" and "English Painters in the National Gallery." Mr. Beerbohm Tree will lecture upon "The Ideal Theatre," and Mr. Churton Collins upon "Shakespeare and the London Theatre." Mr. Frederic Harrison is to treat upon "Ideal London," Professor Skeat upon "Chaucer's London," Sir Walter Besant upon "London at the Norman Conquest," and Sir John Evans upon "London Before the Saxons." Sir Frederick Bridge takes for his subject "London Music and Musicians in the Sixteenth, Seventeenth, and Eighteenth Centuries," whilst Professors Ramsay and Silvanus Thompson will severally lecture upon "Great London Chemists and Physicists."

THE new laboratories for anatomy and physical science are nearly completed, Messrs. Holloway Brothers, of Battersea, being the contractors. The block, which stands at the corner of Wakefield-street and Handel-street, Bloomsbury, forms the first portion of the scheme for new buildings to be erected, at an estimated cost of about 20,000*l.*, from Mr. J. M. Brydon's designs. In course of time the present headquarters, at No. 30, Handel-street, together with, as we understand, one or two houses adjacent in Hunter-street, will be removed for the proposed completion of the works. The school was founded in 1874. Three years later the students, who now number 170, were admitted to the wards of the Royal Free Hospital, Gray's Inn-road, and obtained sanction from London University to enter for examination in degrees. The existing school comprises a pleasantly situated house, having a spacious verandah and garden along its east side, in Handel-street; it was originally built, according to a local tradition, by George IV. for Mrs. Fitzherbert. College Hall was established in 1878, in Golden-square, as a residence for women students of this school and University College. The

name of Henrietta-street was changed to Handel-street, by the late Metropolitan Board of Works, in November, 1887. The site is on the Foundling Hospital estate.

IN the Annual Report on the sanitary condition of Whitechapel, by the Medical Officer, Mr. Joseph Loane, a strong protest is made against the erection of large barrack-like tenements, where numbers of persons are housed in too close proximity for healthy conditions. The Report says:—

"When there was no available vacant building land in the Whitechapel District, and when almost every house within it was a dwelling-house, the population was less than it is now. At the present time large areas are covered with warehouses, stores, schools, &c., so that the increased population are housed to an enormous extent in huge barrack buildings, which sometimes are constructed so as to allow light and air to permeate the rooms, and sometimes not. The effect of this modern invention is to increase the density of population to a damaging degree. I am aware that some gentlemen (more particularly architects) argue that the movement of air, constantly taking place, naturally provides all the fresh air which is required to prevent anything like injury resulting from aggregating large numbers of people upon a limited space, but I would ask such gentlemen to compare sickness and death rates in two districts occupied by the similar classes of comparable ages. It could be easily proved that where the greatest density was present, there would be found scrofula, consumption, and allied diseases, out of all proportion to the number of cases which would appear in the neighbourhood where the density of population was restrained within reasonable limits. . . . I have reason, moreover, to believe that the spread of zymotic diseases is aided by the general plan of construction adopted in dwellings of this class. A staircase leading to a corridor which affords access to many rooms more easily facilitates the spread of disease than in the case of tenements which are more separated. It may also be said that as the staircases and passages frequently have to constitute the playground of the children, another factor is imported to account for the spread of disease."

It is stated that these quaint old almshouses are about to be demolished for an extension of Free Trade Wharf, and some adjacent premises by the riverside, Shadwell. With their chapel and court-room they form three sides of a quadrangle at the south-end of School House-lane, Broad-street. The charity was originally founded, in the year 1540, by Nicholas Gibson, and Lady Avice his wife, who erected buildings for a free school, and houses for the master and almshouses, to be maintained out of his estates after the death of his widow. By a surrender, dated August 6, 1552, of Alice Knivett (formerly wife of Nicholas Gibson), a large amount of property in Ratcliff, devised to her by her husband's will, was surrendered to the lord of the manor of Stepney, to her own use for life, with remainder to the use of the Coopers' Company for ever upon various trusts. The trusts included the maintenance of the school, and the support and maintenance of fourteen poor persons in the adjoining almshouses. The seven houses were rebuilt by the Company in 1694, and again, after the great fire of July, 1794. In 1611 Tobias Wood, a benchman of Lincoln's Inn, gave 600*l.* to the Company for the maintenance of six poor Coopers near Gibson's almshouses. The Company bought three tenements at Garlick-hythe for 326*l.*, and built rooms for Wood's pensioners on the east side of the premises.

we describe, where inscriptions record the two benefactions. According to an official return published in 1881, the incomes arising from the Gibson and Wood bequests amounted to 2,093*l.* 12*s.* 7*d.* and 293*l.* 3*s.* 9*d.* respectively. Provision will be made for giving increased annual pensions to the occupants, who are thus dispossessed of their homes.

Mount Felix,
Walton-on-
Thames.

THIS riverside property is to be sold, pursuant to an Order of the High Court of Justice. The property embraces fifty acres, and the grounds are beautifully wooded with a variety of trees, including cedar, pine, purple beech, white lime, Turkey oak, hickory, poplar, and elm. The house was built, in the Italian style, after Sir Charles Barry's designs, in 1835-9, for Charles, fifth Earl of Tankerville, and was lately the residence of Sir Edward W. Watkin. The fourth Earl, *obit* 1822, had bought the property from the representatives of Samuel Dicker, who occupied the former house, and, having obtained an Act in 20 Geo. II., built at his own expense a bridge across the Thames close by his house, employing William Etheridge as architect. The bridge, constructed of wood upon stone piers, was remarkable for the span, 132 ft., and altitude, 26 ft. above flood-water, of its central arch; the two side arches were of 44 ft. span, with an altitude of 18 ft. above flood-water. Dicker's nephew, M. D. Sanders, obtained an Act, 20 Geo. III., c. 39, for rebuilding the bridge, which was done by James Payne, architect also of the bridges at Chertsey, Richmond, and Kew. Payne lowered the steep gradient of the middle arch, which he replaced with two, turned the four arches with stone, and carried up the superstructure in brickwork.

WE read that the Folkestone Race-course Club have converted the remains of the old moated manor house for the purposes of their headquarters and club-house. The ancient manor of Le Hangre was formerly divided into two—Westenhanger and Ostenhanger, held respectively by the families of Auber-ville and Criole; these became united, *temp.* Edward IV., under Sir Edward Poynings of the latter. His descendant, in Henry VIII.'s reign, rebuilt the house at Westenhanger upon a magnificent scale; it had 126 rooms, a chapel vaulted in stone; a hall, 50 ft. by 32 ft., with a music gallery; a gallery 160 ft. long; and an inner court, 130 ft. square. Of the nine towers, alternately square and circular at base, one, on the north side, 'has been popularly known as "Fair Rosamund's." Hasted (1790) describes the ruins as being "still august and noble," consisting of walls and two towers on the north and east sides; the materials, whereof a large number of worked fragments have been dug up from time to time, are of quarry stone, reputedly from Otterpoole, in Lympne, and, for the sculptured work, of stone from Caen. Sir Edward Poynings, *temp.* Henry VIII., was a K.G., Constable of Dover Castle, and Lord Warden of the Cinque Ports. His son Thomas, advanced Baron Poynings of Ostenhanger, exchanged the property for other lands with Henry VIII. who there made a large park. It subsequently passed to John Dudley, Duke of Northumberland, the Clintons, Sackvilles, Thomas Lord Strangford, *temp.* James I., and the Finch

and Champneys families. In 1701 most of the materials of the house were sold for 1,000*l.*, the north-east portion of the fabric being converted into a residence, which in its turn was dismantled; a smaller house was then built out of the ruins. The first house had been erected by Bertram de Criole, styled the "Great Lord of Kent," *temp.* Henry III.

The Baden
Water-Cure.

THOSE who know Baden—by Vienna—will find, perhaps not without regret, that in one short year a great change has taken place there. The old castle, with its watch-towers and characteristic subsidiary buildings, has disappeared; and in its place, we are informed on credible authority, "architect, craftsman, and physician have united their best, and by well-considered plans have raised an institution that impresses the beholder with its beauty, and towers proudly above all others of its kind in its adaptation of all the newest discoveries of medicine and all the latest technical and sanitary inventions." It is, in short, a large establishment for the reception of patients taking the water and other cures, and has been erected from the designs of Herr Karl Haybäck, of Vienna. There are seven dwelling-houses, five guest-houses, a wash-house, and a machinery shed among the new buildings; for other purposes some houses in and about the site have been adapted. One of these is for ever sacred, having been for two years the dwelling-place of Beethoven: it is something of a shock to find that this has become an "Inhalatorium"!

Exhibitions in
Paris.

THE "Société des Pastellistes Français" has opened its fourteenth exhibition in the Georges Petit Gallery. M. Besnard shows with his usual high qualities in this class of work, in his decorative figures of the Four Seasons, and a fine portrait of a young girl. M. Renée Menard exhibits various pastels also of a decorative character, among which may be specially mentioned the "Tombee de la Nuit"; MM. Guignard, Nozal, and Billotte exhibit landscapes among which are some interesting scenes in the suburbs of Paris; and M. Lhermitte has reproduced, with great vigour and intensity of expression, scenes in rural life. We may notice also "Cruche Cassée" by M. Callot, "Conversation" by M. G. Latouche, the portrait of Mme. Hégion by Mme. Madeleine Lemaire, and (though we do not profess to understand their meaning) the symbolic extravaganzas by M. Jean Veber. At the same gallery is to be seen a small collection of the works of M. Tanzo, a young artist of much talent, who has here devoted himself to pictures of the beautiful though rather sombre scenery of the parks of Versailles. Among the best of these are the "Bassin du Grand Trianon," with Mansard's architecture reflected in the calm water, the "Bosquet de l'Arc de Triomphe" and the "Bosquet de la Reine." The exhibition is well worth a visit.

THE SCIENTIFIC RATIONALE OF GLASS PAINTING.—We are obliged to hold over this article, which is advertised, for want of space.

ART UNION OF LONDON.—The Council of the Art Union of London will shortly issue to members of the Society an etching after Mr. Briton Riviere's picture, "In manus tuas, Domine." The picture will be remembered by those who visited last year's exhibition at the Guildhall.

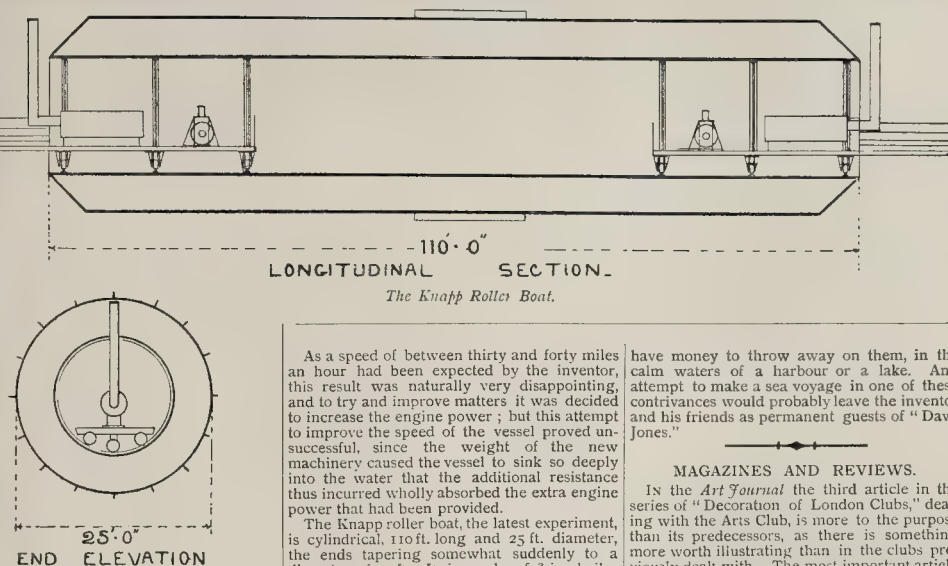
THE DISCOVERY AT THEBES.

AGAIN there is news from Egypt, though not of the earliest times. It seems as if the great kings buried at Thebes are all to be restored to us in the flesh. The find of Deir el Bahri, in 1881, is now almost a household word. There then the mummies of some fifteen of the kings, and of numerous royalties of hardly lower rank, were found stowed away in a narrow tomb-passage. Apparently they had been secreted, with little regard to their ancient fame, by a new dynasty that had no mind to undertake the endless worry of guarding the royal rock-sculptures from sacrilegious thieves.

The Theban period begins with the eleventh dynasty (circa 3000 B.C.), and ends with the priest-kings of the twenty-first. Of the eleven dynasty kings we have, indeed, only the coffin the mummies were probably ill made, and even if some of them may still have been extant, the beginning of the present century, their portraits were probably scattered by the plunderers seventy years ago. Their sepulchral monuments were small pyramids of brick, which have now entirely disappeared. The twelfth dynasty kings were buried elsewhere. Of the thirteenth dynasty and its immediate successors several kings are known to have been interred at Thebes. The scarab from the breast of one of them is now in the British Museum, but some may still await their awakening to life in death by the spade of the excavator. With the native kings of the seventeenth dynasty, who revolted against and overcame the Hyksos domination, we begin to feel something like personal acquaintance. At Deir el Bahri lay also the mummies of the kings of the eighteenth dynasty down to Thothmes III., whom its power culminated. There also were the first three kings of the nineteenth dynasty and Rameses III., chief king of the twentieth. The priestly family of the twenty-first dynasty to whose pious care we owe the preservation of all the above, were fully represented.

The new find at Thebes notified in a letter to the *Times* of Wednesday, is of kings of the second rank, not makers of the empire, but rulers who entered into the labours of the predecessors. The heretic kings from the end of the eighteenth dynasty, and the illegitimate rulers from the end of the nineteenth are still missing, but most of the gaps in the first rank are filled. To the eighteenth dynasty mummies are now added those of Amenhotep II. and Amenhotep III. The latter king was one of the greatest builders in Egyptian history. His works at Karnak, Luxor, and elsewhere are on a grand scale; the statues "Memnon" decorated the entrance of his funerary temple, and his vacated tomb is the earliest and one of the finest in the valley of the Tombs of the Kings. Both this king and his grandfather, Amenhotep I., lived in the utmost splendour, but they were not national heroes. So also with Merneptah who is perhaps intended by the "Sety II." in the Cairo letter to the *Times*. It will be strange if the corpse of the "Pharaoh of the Exodus" is now at length recovered, not from the Red Sea, but from the sands of Thebes. The mummy of Setnekht, founder of the twentieth dynasty, is also found. Though honourably spoken of by his great son, Rameses III., apparently he was not admitted to the first rank, being excluded from the galaxy at Deir el Bahri. The weakling descendants of Rameses III. are of little account.

But in many ways the present discovery is royal dead is far more impressive than that made at Deir el Bahri. The hitherto unopened tomb of Amenhotep II. himself has been entered. A long sloping descent in the rocks leads over a pit-trap to a series of chambers. In the first of these is a beautifully-painted boat of wood upon which lies the body of long-haired man, in perfect preservation, but not mummified. He had been bound to the boat, gagged, and slain by the thrusts of a sword-blade. This can be nothing but a human sacrifice at the tomb, such as we had already apprehended from tomb-paintings of the period. In the next chamber lay the bodies of a man, a woman, and a boy, also in startling preservation but not mummified. In this chamber, as in the others, the floor was covered with wooden statues, vases, and furniture. Jewellery, such as would attract thieves, had probably been removed in ancient times as a precautionary measure. The third chamber described as a nob's hall, the roof supported by square pillars, and the ceiling decorated with



low stars on a dark blue ground. The walls covered with paintings in brilliant preservation. At the end is the sandstone (? quartzite) cophagus, sunk in the floor and resting upon blocks of alabaster, and in it reposes the mummy of King Amenhotep II., with flower lands still upon neck and legs. In a smaller chamber at the side lie nine royal mummies, as yet unidentified, though doubtless appended in bandages inscribed with their names. The other seven mummies are those of Thothmes IV., the son, and Amenhotep III., grandson of the king for whom this tomb was excavated; of Sety II. (? or Merenptah), of Nektah, of Rameses IV., VI., and VIII. (or, the latter should be called, Rameses VII.), and of Rameses V. is known to have been a *persona grata* to later kings.

It is the discovery of this great royal tomb, practically intact, and with the strange evidence of human sacrifice still apparent, which makes almost surpass in interest even the find at Sir el Bahri. The situation of the tomb is as yet reported. Every archaeologist will await the arrival of further details with impatience. It is highly satisfactory to learn that W. E. Garstin, who has already deserved the credit of archaeology in the matter of Philae, has been engaged for the preservation of the main constituents of this royal interment on the spot, for future visitors to Egypt may inspect it with reverence in the midst of its proper surroundings. Doubtless all necessary precautions will be taken to prevent the decay which too often sets in among relics of mortality shortly after their discovery and exposure—even in the air of Upper Egypt.

ANOTHER ROLLER BOAT.

ONLY a few months have passed since it was clearly demonstrated that the Bazin roller was a failure, yet this has not deterred inventors attempting to design a vessel that would roll on the surface of the water instead of ploughing its way through it, and M. Knapp, of Canada, has lately constructed a boat which, while differing considerably in detail from that made by M. Bazin, is really similar in principle.

It will be remembered (see the *Builder*, January 30, 1897) that the Bazin boat consisted of a platform supported by six large hollow wheels, the buoyancy of which was sufficient to keep the vessel afloat. Each pair of wheels were caused to rotate by steam power, but the main propelling action was obtained from the screw of the ordinary type. When this vessel made its trial trips it was found that the water adhered considerably to the wheels, acting like a brake, prevented a greater speed than some six or seven miles an hour being attained.

As a speed of between thirty and forty miles an hour had been expected by the inventor, this result was naturally very disappointing, and to try and improve matters it was decided to increase the engine power; but this attempt to improve the speed of the vessel proved unsuccessful, since the weight of the new machinery caused the vessel to sink so deeply into the water that the additional resistance thus incurred wholly absorbed the extra engine power that had been provided.

The Knapp roller boat, the latest experiment, is cylindrical, 110 ft. long and 25 ft. diameter, the ends tapering somewhat suddenly to a diameter of 15 ft. It is made of 3-in. boiler plate, and has an inner and outer casing, with a watertight space between them, the ends of the inner casing being open to provide admission to the interior of the vessel.

A description of this curious boat has recently been given in the *Scientific American*, to which we are indebted for the particulars in this article. The deck of the boat, if the name can be applied in this case, is placed inside the vessel and is supported on wheels running on ordinary rails securely attached round the circumference of the inner casing, so that, as the cylinder revolves, the deck remains level. There are actually two of these "decks"—one near each end of the vessel—and on each of them is placed a boiler and a 60-h.p. engine, the funnels from the boilers protruding from the open ends of the cylinder. Now, it will be seen from the above description that if the cylinder were held stationary, the engine platforms would revolve, the engines being geared to the supporting wheels. On the other hand, if the platforms are stationary, then the cylinder will revolve. When the engines are started, the platforms begin to climb the inside of the shell, which being free to revolve, the platforms roll the shell round beneath them. On the outside of the shell are bolted sixteen paddles or floats, 15 ft. long and 8 in. deep; they are not placed radially to the cylinder, but are slanted so as to hold the water and drive the vessel forward. The boat carries two large tail-boards, or rudders, which are located one on each side, below the platforms.

The trial trip was made some few months ago at Toronto, where the boat had been constructed. When the engines were started, the cylinder made six revolutions a minute, the forward motion being at the rate of six miles per hour.

It will be noticed that this vessel is exposed to the same difficulty as that of M. Bazin's, since the water is liable to cling to the surface of the cylinder and be lifted up, acting as a brake to retard the rotation. This effect will be intensified by the radial floats, which tend to lift a large quantity of water should the boat obtain any speed.

Another troublesome problem to be solved is that of wind resistance. A wind pressure of only 20 lb. per square foot would equal a total pressure against the boat's surface of about 20 tons, so that it is evident that the vessel could never be made to roll except in calm weather, or in the direction of the wind.

This experiment in marine roller locomotion is as novel in its way as was its predecessor, and, as in the case of the French boat, it has been carried out at a very considerable expense; but at present it has given no indication that our existing ideas on ship propulsion are likely to be revolutionised. Experiments of this kind are amusing and interesting, for those who

have money to throw away on them, in the calm waters of a harbour or a lake. Any attempt to make a sea voyage in one of these contrivances would probably leave the inventor and his friends as permanent guests of "Davy Jones."

MAGAZINES AND REVIEWS.

IN the *Art Journal* the third article in the series of "Decoration of London Clubs," dealing with the Arts Club, is more to the purpose than its predecessors, as there is something more worth illustrating than in the clubs previously dealt with. The most important article in the number is that by M. Chas. Yriarte, on the Camerino of Isabella d'Este, a model of which has recently been erected in South Kensington Museum. Mr. Fred. Miller gives some account of the "Clergy and Artists' Association," which has been mentioned more than once in our columns, with some illustrations of work done by members of the Society, most of which is certainly very different from what conventionally goes as church decoration. In an article on "Two Theatrical Productions" ("Julius Caesar" and "Much Ado"), credit enough is not given to the careful study of the Forum scene in "Julius Caesar," which the writer seems to think over-elaborated, whereas it is a far more scholarly reproduction of what was probably there than we usually see in classical scenes in theatres.

The *Easter Art Annual*, in connection with the *Art Journal*, is occupied by the life and works of Mr. Walter Crane, the biographical sketch being written by the artist himself. The principal illustration is a reproduction of his pathetic composition "The Bridge of Life"; the remainder are reproductions of various book illustrations. The article is divided into headings dealing with different classes of artistic work, and some account by Mr. Crane of his method of treating each, which is naturally of considerable interest. Mr. Crane's book illustrations have had a very large influence on the illustrative art of his day—he is almost a school in himself, with many imitators. The whole of the illustrations to children's books are delightful. It is rather a question whether the more serious illustrations, of a quasi-decorative kind, to great poems such as the "Faerie Queene," will be accepted by a future generation as satisfactory. They appear to us to be too much pervaded by an archaism which, though perhaps not consciously affected, represents a fancy of the present time rather than an appeal to broader and more permanent artistic perceptions.

In the *Magazine of Art* an article on Chéret, the French artist, best known in this country as a designer of posters, is illustrated by some reproductions of red-chalk studies of figures, which show that his field is rather wider than is generally supposed. Mr. Starckie Gardner draws attention to some of the iron-work at Hampton Court—stair-railings, &c.—which has rather been overlooked beside the more permanent claims of Tjouw's garden screen; and Mr. Aymer Vallance contributes an article on the development of wall-paper designs and manufacture.

The *Studio* (March 15) publishes an illustrated article on "Decorative Art in Paris," a very interesting subject, as there is a kind of revival or new movement going on in Paris at present in decorative art; but we must confess that the designs illustrated give us the same feeling that we derived from the furniture and other such work at the New Salon last year, viz.: that

there is a fatal spirit of "cleverness," of *chic*, about these French decorative designs, and an absence of feeling for the beauty of pure and simple line, which gives a kind of bad taste to them. An article on "Art in Gridirons," by Mr. F. A. Jones, is accompanied by some interesting illustrations of old gridirons, which show how much design can be put into this humble implement.

The *Architectural Review* (Boston) No. 2, Vol. V., is almost entirely occupied, both in illustrations and text, with the Tennessee exhibition; the "Trans-Mississippi Exhibition," as it is called. The large details of the elevations of the buildings, with which the plates are filled, seem hardly worthy of so much illustrative space, as they are little more than applications of the orders, in a more or less academical manner, to buildings executed in a cheap imitation of stone in a perishable material. This is the very last kind of thing that a temporary exhibition building ought to be. In designing buildings for a temporary exhibition there is a great deal of scope for originality and character in design, as some of the French architects showed us admirably in structures for the 1889 exhibition; but the problem is to combine an obviously temporary character with some architectural interest, not to make perishable imitations of monumental architecture.

Among the subjects specially illustrated in the *Artist*, which has a number with a great variety of interest, are the "The Impressions of the Luxembourg Museum," "The Evolution of the Poster," the works of Mr. Jacob Hood and of Mr. Adrian Jones, and the work of Antonin Daum, a French glass-worker of the present day. All these subjects are largely illustrated, but we object to the practice, which seems peculiar to the most modern journals dealing with art, of distributing illustrations broadcast over the pages, without any consideration of proximity to the articles referring to them; a method which seems to mix up everything in a manner rather irritating to the reader.

The illustrations of recent Dutch decorative design under the heading "Das Neue Ornament" in *Decorative Kunst*, though differing in manner from the Paris work referred to in a preceding paragraph, produce a similar impression of the prevalence of eccentricity over considerations of beauty and purity of line. There seems to be a striving after originality at all costs. The conclusion one comes to in looking at some of these new developments in decorative design is that, although in painting and sculpture, and in some respects in architecture, the French are our betters, in decorative design there is no work done anywhere at present which is equal to the best English decorative art of the day.

In the *Antiquary*, Mr. Lewis André writes an article on "Old Sussex Farmhouses and their Furniture," with some sketches, including some interesting forms of fire-irons and other implements. The recommendations made in Mr. G. Payne's article on "The Preservation of Antiquities," especially in regard to the means to be taken to secure the preservation of objects found by labourers in the course of excavation for buildings or other purposes, should have attention.

The *Engineering Magazine* includes two articles of special interest to English readers; that on "British locomotives," and that on "Heating Buildings by Steam," in which we presume we get the results of the latest American methods.

The *Fortnightly* contains an article by Mr. H. M. Paull on "The National Gallery and Common Sense." The common sense which the author wishes to see applied in the National Gallery consists in part in the grouping of the pictures according to authorship, and not according to considerations of symmetry and size. He gives some instances of the manner in which painters and schools are disjoined. We agree with the criticism entirely, and also with the comments on the absurd and incomprehensible neglect of the French school of painting in our national collection.

In the *Revue Générale* the illustrated art article which has now become a feature of this publication is occupied this month with various examples of German architecture, including among the illustrations a rather effective view of Spire Cathedral as seen rising above a mass of trees which conceal the lower portion of the building.

In *Scribner* the "Field of Art" article describes the new porches of Trinity Church, Boston, left in an unfinished condition by

Richardson. Two illustrations are given of one of the porches, rich and effective work—a kind of neo-Byzantine architecture with a great deal of sculptural decoration. The writer seems to think that the building was more effective in its unfinished state. We are not told who is the architect for the addition, or whether it is the carrying out of a design sketched by the original architect.

The *Century* is commencing a series of articles on "The Wonders of the World," commencing with "The Pharos of Alexandria," concerning which we know nothing at all with certainty except the fact of its former existence, so that the article and Mr. Castaigne's sketch are alike rather imaginative. The "American Artists Series" devotes a very few words to C. F. Ulrich, born at New York in 1858, with an engraving of his very pretty picture "The Wood Engraver," a woman seated at her work before the light of a window through which a brick wall is seen. Ulrich, it appears, received the completion of his artistic education at the Munich Academy, so that he cannot quite be reckoned an American artist by training.

Harper includes an article by Mr. Worthington C. Ford on the now somewhat belated subject of "The Commercial Aspects of the Panama Canal."

The *English Illustrated* contains a popular but rather amusing article on "Flying Machine," treated not scientifically but historically; the interest lying in the reproductions of old engravings of various devices for flying. The number also includes a sketch of the life and works of Angelica Kauffmann (so spelt: should it not be "Kaufmann"?)

The *Gentleman's Magazine* includes some information on the works of Lorenzo Lotto and Dosso Dossi, under the title "Two Painters of the Sixteenth Century."

We have received the *Genealogical Magazine*, *Knowledge*, and *The Quarry* for the current month.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting on the 6th inst., Mr. Emanuel Green, hon. director, in the chair, Mr. Mill Stephenson exhibited rubbings of incised slabs from the churches of Madron, Ludgvan, and St. Buryan, Cornwall. These slabs of black slate are peculiar to the country and are of local manufacture. The figures are in slight relief, but the inscriptions are incised.—Mr. Talford Ely then read a paper on the antiquities of Hayling Island. In the year 1045 the Manor of Hayling was granted to the church and monks of Winchester; but William the Conqueror gave the greater part of the island to the Abbey of Jumieges. In the reign of Henry III., a priory was built in Hayling, which, on the suppression of alien priories by Henry V., was bestowed on his new foundation of Carthusians at Sheene. Henry VIII. granted the priory of Hayling to the College of Arundel. Before the building of the priory there was a church in Hayling; but it was swallowed up by the sea in the times of the Edwards. The older font in South Hayling Church may have belonged to this earlier edifice. The later church dates from the thirteenth century, and contains many curious features. North Hayling Church is perhaps more ancient. Near it is the oldest house in the island. The Manor House dates only from 1777, but stands on the site of an older building, to which belonged the moat, the square well, and the manorial dovecote. Close by is the old Tithe Barn, 140 ft. long by 40 ft. broad, said to be "capable of holding upwards of 150 loads of sheaf wheat." Its stone basement is said to date from the fourteenth century. In 1293 we hear of the prior holding a "water-mill worth by the year sixty shillings." This was, no doubt, represented by the tidal mill, some of the charred timbers of which are still standing. Tourner Bury is an almost circular space surrounded by an earthen rampart and fosse, and is of British origin. In the Towncil Field, not far from North Hayling Church, are the foundations of a large building, near which much pottery has been found, and also coins ranging from a middle brass of Augustus to a British imitation of a coin of Postumus. During an experimental excavation of this site Mr. Ely has discovered, in a trench 21 ft. long, over fifty tesserae, which had obviously formed part of a mosaic pavement. This established the Roman origin of the remains. For the illus-

tration of Mr. Ely's paper, Mr. H. R. Trigg Hayling, lent the above-mentioned coins, several sketches; and Mr. Ely exhibited photographs and specimens of pottery given to him by Mr. Carpenter Turner, the owner of the in question.—Chancellor Ferguson contributed a paper on "More Picture Board Dummies," being a continuation of the subject treated of him on former occasions. He first dealt with those that exist in the Town Hall, Dorchester. These figures are life size, clad in armour, having his hand resting on a large shield, and armorial bearings thereon, and were made some thirty years ago as a decoration of the town on the occasion of a local festival. He also gave descriptions of two dummies in possession of Sir E. R. P. Edgcombe, representing a boy and girl, also of a little girl, the property of Major Brown, of Castle, Northumberland. Perhaps the most interesting of the series were four from Rye Castle. Two of these are grenadiers, of peasant woman with a basket of eggs, and other a man carrying a goose. Of the first, Chancellor Ferguson brought detailed evidence to show that they represented Royal W. Fusiliers of the time of George II. Chancellor Ferguson exhibited photographs and drawings of the various dummies described.—Lancashire has been selected as the place of the next annual meeting of the Institute. The excursions last from Tuesday, July 19, to 26 inclusive, were to the BRITISH ARCHÆOLOGICAL ASSOCIATION. The ninth meeting of the session was held on 22, Sackville-street, on the 6th inst., Mr. W. Stone in the chair. Mr. Way exhibited an interesting collection of antiquities recently discovered, consisting of a Romano-British vase, quite perfect and in fine condition, a vessel, an urn, several small glass bottles, the bones of the forearm of a young fœtus, together with a finger ring and several bractelets, which still encircled the bones at a time of discovery. These were all found at Southwark, as were also the following articles, an iron seal of the thirteenth century for some private owner for sealing the conveyance of his land, and two curious examples of the toys made in the shape of a cock, which superseded the inhuman use of the living in the Shrove-tide sports of cock throwing. Mr. Way also exhibited a British head, a bone spear head found in Thames-street, paper by Miss Russell upon "The character of Wolsey's inscription now at Oxford compared with older ones in Scotland," was read by Birch.

COMPETITIONS.

ASYLUM, BIRMINGHAM.—The competition designs for the new lunatic asylum at Edgbaston, opened on the 5th inst. to the inspection of members of the Birmingham City Council. Six local firms of architects were instructed to prepare designs, a sum of 100l. being offered in each case. The selection of the committee under the advice of their assessor, Mr. G. H. of London, are the plans of Messrs. Marshall Chamberlain. The other five competitors were Messrs. Cossins & Peacock, Messrs. Marshall & F. B. Osborn, Messrs. Ingall, and Messrs. Cross & Nichols.

BOARD SCHOOL, BLACKBURN.—Mr. Cheers & Smith were the successful architects in the local competition for a new Board School to be erected in Accrington-road, Blackburn, and they have received instructions to proceed with the work at once. Thirteen sets of designs were sent in, and they were adjudicated by Mr. A. Royle, F.R.I.B.A., of Manchester. The estimated cost of the school is 6,000l.

CLOCK TOWER, LEWISHAM.—Upwards of sixty designs have been received in the competition for the erection of the clock tower at the junction of the High-street, Lewisham, the High-road, Lee, in local commemoration of Her Majesty's Record Reign. It was stipulated that the cost should not exceed 700l.

TOWN HALL FOR DUKINFIELD.—The Dukinfield District Council, having decided to erect a Town Hall at a cost of 10,000l., advertised plans. In response twenty-two sets of designs were received. The premiums have now been awarded as follows: first (40l.), Messrs. Eaton, Sons, & Cantrell, Ashton-under-Lyne (20l.), Messrs. Hindley & Marshall, Moncton, Eccles.

APPOINTMENT.—Mr. Alfred Young Nutt, Surveyor to the Dean and Chapter of St. George's Cathedral, has been appointed Clerk of Works at W. Castle, in succession to the late Mr. T. Howe.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL SOCIETY.—Members of this Society met on Wednesday the 6th inst.—Mr. W. N. Cumming in the chair—when a lecture was given by Mr. John Medley on "Building Stones: their Preparation and Use." The lecturer insisted on the necessity of architects knowing more about the stones they employed, and described and named building stones, their various dressings and their special purposes.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—At an annual meeting of this Institution on the 5th inst. Mr. W. H. Preece, C.B., F.R.S., Vice-President, in the chair, the paper read was on "The Electricity Supply of London," by Mr. W. H. Preece. The supply of electricity on a commercial scale had, said the author, started in London after the passing of the Electricity Act of 1882, which amended the Electric Lighting Act of 1882, principally by extending the date of compulsory sale to the Local Authority from twenty-one years to forty-two years. In many companies applied for Provisional Orders, and, in determining which were to be granted powers, and the districts over which they were to be extended, the Board of Trade decided that competition would be injurious to the public, and that it was desirable to allow one direct-current system to compete with one alternating-current system. There were now in London eleven important companies and five Vestries supplying electricity, and three other companies and three Vestries were taking steps to start works. The total invested in the industry amounted to £10,000,000, and plant was installed to the extent of 10,000 h.p., the equivalent of 2,000,000 eight-lamp units being connected to the mains. The annual revenue was £800,000, and the annual expenditure £450,000. Of the £350,000 for supplying electricity in London, £100,000 was for the City of London, £100,000 for the County of London, £100,000 for the House of Commons, £100,000 for the House of Lords, £100,000 for the Admiralty, and £100,000 for the War Office. The direct-current systems were divisible into two classes, the high-pressure and the low-pressure. The former rotary transformers were used to reduce the high pressure to a low pressure, while the latter produced and distributed electricity at the same pressure at which it was applied to consumers. The direct-current systems were applicable to compact areas, and the use of high pressure, to scattered or extended compact areas. The chief advantages of the direct-current system were the possibility of using storage batteries, which could be employed with the alternating-current system, greater efficiency in distribution, and greater adaptability to motive power. The undertakings using the system were the City of London Company (high pressure), Charing Cross and Strand Corporation (high pressure), Westminster Corporation, the St. James's Palace Company, the Kensington and Chelsea Vestry, the Notting Hill Vestry, the St. Pancras Vestry, and the Metropolitan Company (at one works). The generating works of the several undertakings in London contained many interesting features. No less than twenty different works had been erected. The boilers comprised the water-tube, marine, Lancashire, and miscellaneous types; but the prevalence for the water-tube boiler was very marked. The works were liable to sudden changes through fogs, and the quick-steaming properties of this type of boiler were of great advantage. The boilers were fired chiefly by coal and Welsh coal, but in the works of the City of London Company and the County of London Company mechanical stokers and pulverised coal were used. The use of extensive systems of steam-pipes was being discredited. The multiplicity of valves was unnecessary, and the number of valves was being reduced, and arrangements were made simple and with as few joints as possible. The present tendency was towards engines of the marine type for large outputs. The high-

speed engine was not used for large powers than 750 h.p. Some engineers, however, found engines of 350 h.p. sufficiently large and the most convenient unit to adopt. The dynamos were similar in most works, and were always connected direct to the engines. Storage by secondary batteries was not extensively employed in London, as their maintenance had hitherto proved expensive. But a few works used them entirely for maintaining the supply after midnight, and in the daytime in summer. The author gave the results of a test of a small marine engine and alternator, showing the combined efficiency to be 85.5 per cent. The question of vibration had been of great importance in many works; no cure had been found effective when once vibrations were set up. High-speed engines must have three cranks to be free from appreciable vibration. The favourite methods of distributing electricity were to transmit current at a high pressure in heavily-insulated cables in iron pipes, and current at a low pressure in insulated cables in stoneware conduits or in cables heavily armoured and laid direct in the ground. Rubber was now little used, paper and jute, impregnated with insulating compounds, having been extensively adopted. The usual system of measurement of the electricity supplied was by meter, and the average charge was 5½d. per unit. The average charge in 1890 was 7½d., so that the price of electricity had been reduced in eight years no less than 25 per cent., equivalent to a reduction in the price of gas from 4s. to 3s. A curve was given to show the variations in the price of gas since 1870. The average price had varied between 4s. and 2s., and was now 2s. 7d. The cost of generating and distributing electricity had been greatly reduced in the last few years. In 1892 it was seldom supplied for less than 4½d. per unit. The usual cost was now 2½d. to 3d. The actual cost of generating was about 1½d. per unit, and the cost of management, &c., about 1d. The direct current was everywhere produced at a cheaper rate than the alternating current. The difference was between ½d. and 1d. per unit, or 20 per cent. cheaper. Since 1888 an important inquiry had been held by the Board of Trade regarding the maximum pressure permissible in consumers' premises. The result of this inquiry, in 1896, was to increase the pressure from 150 volts to 250 volts. A comparison was made between the two largest companies in London, namely, the City of London Company, which supplied alternating current, and the Westminster Corporation, which supplied direct current. Both companies had nearly the same number of lamps connected to their systems, the number of 8 c.p. lamps connected being 270,898 and 269,039 respectively. The capital expended was respectively £45,829l. and £46,434l.; the annual incomes per 8 c.p. lamp, 11s. 9d. and 7s. 9d.; the annual expenditures per 8 c.p. lamp, 4s. and 3s.; and the costs per unit, 7.6d. and 5.8d. The industry was growing so rapidly that most undertakings had to seek new sites for generating works, and the tendency was to erect large works on the outskirts of London, where coal could be conveniently brought to the site, and where water could be obtained for condensing. The powers granted under Provisional Orders were limited as regards the compulsory purchase of land, and further powers were being sought by some companies from Parliament, so that they might be placed on the same footing as railway companies. No less than 40,000 h.p. was now being installed in London in order to meet the demand for electricity in the immediate future.—It was announced at the same meeting that eight Associate Members had been transferred to the class of Members. It was also reported that forty-seven candidates had been admitted as Students. The last ballot of the Session 1897-98 resulted in the election of Lord Lister, D.C.L. (President of the Royal Society), as an Honorary Member; of three Members, of thirty-seven Associate Members, and of three Associates.

ORGAN, ST. JOHN'S CHURCH, KNOTT'S ASH.—An organ and screen were dedicated at this church on the 31st ult. The work has been carried out from the designs of Mr. Charles E. Deacon, architect, of Liverpool. The organ is enclosed in a carved oak case, designed in harmony with its surroundings. The organ has been made by Messrs. Conacher & Co., of Huddersfield, whilst all the oak work is from the studios of Messrs. Harry Hems & Sons, of Exeter.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL General Meeting (Business) of this Institute will be held on Monday, to confirm the resolution passed at the Special General Meeting held on April 4 suspending By-law 26.

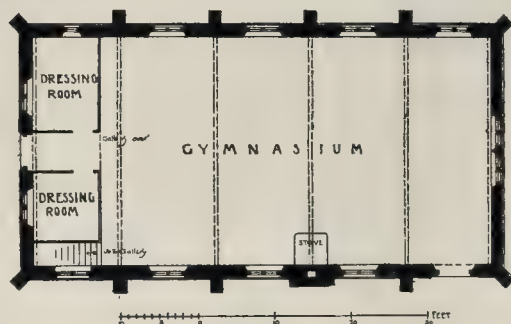
The Lords of the Privy Council having raised certain objections to ambiguities of wording in the additions and amendments to By-laws 30 and 9 as resolved upon at the Special General Meetings respectively held on June 14 and November 13, 1897, it is proposed to alter such additions and amendments as follows:—(a) By-law 30: Provided always that when the Council of the Institute receive a unanimous recommendation formally submitted by the Council of any allied society that a practising member of the profession is eligible and worthy of being elected as a Fellow, the Council shall, during the five years from the date of approval of this provision by the Privy Council, have power to elect him, his work being of sufficient merit. The Council may also elect annually to the Fellowship without ballot the President or President-elect of any or all of the allied societies who may be eligible and apply for admission. (b) By-law 9: To alter the words in the antepenultimate sentence "the said meeting" to "the close of the last General Meeting in June."

At the same meeting the word "first" in the last sentence of By-law 31 will be altered to "last."

The twelfth General Meeting (ordinary) of the Session will then be held when Mr. A. N. Paterson will read a paper entitled, "A Study of Domestic Architecture in the Eastern States of America in the year 1896: with Special Reference to Questions of Plan, Construction, Heating, Drainage, &c."

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The eleventh meeting of the present session of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, on the 6th inst., Mr. Matt. Garbutt, Chairman of the Section, occupying the chair. Mr. A. H. Ryan-Tenison introduced the subject of "Beautifying Church Interiors" in a lengthy paper dealing with the interior decoration of churches from both theoretical and practical standpoints. He commented on the growing desire on the part of the public for coloured decoration and a keener enthusiasm for it amongst architectural students. The decoration of St. Paul's Cathedral, St. Augustine's, Kilburn, the Mortuary Chapel of St. Alban's, Holborn, and the new Roman Catholic Church near Battersea-square, were but instances near to hand of this taste, which was showing itself all over the country. After describing modern theories of colour and expressing the belief that all the theoretical works extant would not make a colourist of one who had not the sense of colour inborn in him, and that true inspiration could only be gained from a study of nature, he concluded this part of his paper by emphasising the following points: "Light" and "colour" were undoubtedly required in this country; in general effect the decoration should be quiet and subdued, simple in treatment, and with one tone of colouring; more powerful in the lower parts, lighter in the upper parts, and the detail more pronounced in the sanctuary. If mosaic were employed, it must be not less than 12 to 14 ft. above the floor; and in all things the decoration must wait on the architecture. Mr. Tenison then went on to describe the various materials and methods used in church decoration—constructional decoration, where the ornament and colour were obtained from the materials of the fabric itself; carving and sculpture; marble, stone, and tile flooring; wall decoration in mosaic, fresco, marble veneers, paint, distemper, stencilling, stamped plaster decoration, &c. He brought his paper to a close with some remarks on the relations between architect and artist, holding that they should work hand-in-hand together, the architect's work not ending with the design of wall and roof, but extending to the furnishing and decoration of the entire structure.—Mr. H. V. Crawfurth Smith, in opening the discussion, said he thought, after what they had heard of the difficulties connected with producing successful frescoes, they would be afraid to tackle them at all. He hoped the meeting would initiate a crusade against the use of highly-polished



Gymnasium, St. Peter's School, York. Plan.

brass work in churches. He was glad to see a lectern of copper in St. Saviour's Church. Mr. E. Swinfen Harris spoke of the value of stencilling as a form of decoration when artistically treated, the ties always being part of the design. In one church he had decorated he had made over 200 drawings for stencils alone. If he had been successful, it was from two causes—that of studying every pattern most carefully, and never being satisfied with it till it had been offered up in its place. He agreed as to the hateful character of lacquered brass in churches, and referred to the case of St. Hilda's, Leeds, where all the vessels were of earthenware. The discussion was continued by Messrs. Hopkins, Strange, and J. H. Jones. The Chairman deprecated the abuse of any particular metal. Brass was as capable of artistic treatment as any other metal, and even cast iron could be made very beautiful. Mr. F. R. Farrow attended the meeting as Special Visitor, and summed up the discussion with some remarks on the general principles which should guide one in designing the decoration of a church. The next meeting will be held on the 27th inst., when Mr. J. Humphrey Jones, B.A., will read a paper on "Hospitals: principally those for Isolation Purposes."

Illustrations.

THE NEW BATHS, HARROGATE.

ME gave illustrations, in the *Builder* of August 2, 1890, of the accepted competition design for this building, by Messrs. Baggallay and Bristowe; we now give some illustrations of the finished building, showing the exterior, the interior of the central hall and pump-room, and the cooling-room of the Turkish bath.

The exterior had to be designed for execution in the local "wall stones" as far as possible. These wall stones are got in thin beds of from 3 in. to 6 in., mostly about 3 in. or 4 in., and the face is merely "knapped"; they produce an effective wall surface.

The end pavilions were originally intended to have—and perhaps may some day have—similar parapets and pinnacles to those on the middle block.

The central hall is used as the pump-room, and the palms behind the counter are now replaced by a fountain. The door seen at the furthest end is the main entrance; the view is taken from the one leading into the winter garden and promenade.

The view in the Turkish bath is looking from the entrance of the dressing-room through the cooling-room to the cold plunge, beyond the screen on which the clock stands. The architecture and decoration follow Cairene models.

The plans of the building were given in the illustrations of the competition design, already mentioned.

GYMNASIUM, ST. PETER'S SCHOOL, YORK.

THIS building, erected in 1895, was the gift of an old schoolboy. It was made Gothic in style to harmonise with the existing buildings, which are of the florid Gothic of 1830. The walls are built of Pateley Bridge stone, and the dressings are from the Bolton Wood quarries,

near Pickering. The roof is covered with red pantiles. The sun-dial to the south door has the arms of the Dean of York and the Headmaster, Mr. H. T. Handford, below it; while the west door has the arms of the Dean and Chapter of York, surrounded by the York rose. The contractor was Mr. T. P. Barry, and the carving was executed by Mr. Milburn, both of York. Mr. Francis W. Bedford, of Leeds, was the architect.

PROPOSED SCREEN AND DECORATION FOR ALL SAINTS', CAMBRIDGE CIRCUS.

THE screen and decoration proposed for this church are intended to form, together, one conception of what is sacred and fit for the inspiration of those who worship there. The walls of the chancel are set apart for the painting of three subjects, "The Nativity" (on the left, "The Crucifixion" (in the centre), and "The Resurrection" (on the right); below these pictures the panels will have masses of plain colour. The screen will be decorated with scrolls and texts, and in the lower panels angels in adoration will be painted.

G. J. J. LACY.

COMPETITIVE DESIGN FOR CHURCH AT EXETER.

THIS is one of the designs made for a rather too famous church competition at Exeter. The design was prepared in accordance with the instructions to architects, providing accommodation for 600, and capable of being built in sections and with provision for future extension. The limit of cost is 6,000*l.* exclusive of fittings, heating, and tower.

The nave and chancel are arranged under one continuous roof and are 22 ft. wide. The aisles are carried through behind the choir and are each 13 ft. 6 in. wide. Oak screens were intended across the full width of the church at the entrance to the choir, and also on each side of the choir.

The tower was placed opposite the end of Clarence-street, which is a main road with public gardens at the end of it. It was also arranged so that it could be added at any future time. A heavy tower did not seem advisable owing to the nature of the foundation, hence the motive of the light upper portion which is intended to be of wood covered with copper. The organ was to be placed in the tower and played from a console adjoining the choir.

Special attention had to be given to the liability of the site to floods, hence the building was raised above the road, and the heating chamber was planned under the sanctuary with its floor 6 in. above flood level.

The materials proposed were hammer-dressed broken-coursed red Parkscombe limestone for the general walling with box-ground or Douling stone dressings; 7 lbs. lead for covering the aisle roof, and grey stone slates for the nave and chancel.

Inside, the walls were shown panelled 6 ft. high with wood, and plastered above with stone dressings and quoins.

The author of the design is Mr. W. H. Brierley, of York.

The drawing was exhibited in last year's Royal Academy.

CHURCH OF ST. SAVIOUR, ST. LEONARDS-ON-SEA.

THIS church, which we illustrate by the reproduction of a sketch exhibited in last year's Royal Academy, is to be erected in a growing district to the extreme west of St. Leonards, and is to take the place of an iron structure now existing. It will be built of brick and stone, the roofs being covered with copper. Owing to the great fall in the ground, the space below the church will be utilised as a church room and for other parochial purposes.

Messrs. W. H. & J. D. Murray are the architects.

THE SURVEYORS' INSTITUTION.

A TWO-DAY meeting of this Institution will be held next week at Manchester. The members will assemble on Wednesday at 10.45 a.m. in the Mayor's parlour at the Town Hall, where they will be welcomed by the Reception Committee headed by Mr. John Holden, the Provincial Chairman of the District. After the reception by the Local Committee, the proceedings will be opened with a brief address by Mr. Christopher Oakley, the President of the Institution. The following papers will then be read and discussed: (1) "Manchester from 1847 to 1897" by Mr. John Holden; (2) "Lessons from Fire and Panic," by Mr. T. Blashill; (3) "A Consideration of some of the Present-day Difficulties met with in a Land Agent's Practice," by Mr. C. P. Hall; (4) "Notes on the Construction of Town Buildings," by Mr. Howard Chaffell Clarke. A dinner will be held at the Grand Hotel in the evening at 6.30. On Thursday visits will be made to various places of interest.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

PUBLIC LIBRARY, ETC., SHOREDITCH.

THE fifth visit of the season, which took place on Saturday, April 2, was to Shoreditch Public Library, and Baths and Washhouse adjoining.

The library, which has been carried out from the designs of Mr. H. T. Hare, occupies a corner site, light being obtained from three sides. A short flight of steps from the public entrance in Pitfield-street leads to the vestibule the chief feature of which is a modelled plaster frieze by Messrs. Jenkins, coloured by Mr. Gerald Moira, the subjects being taken from Shakespeare's plays. Leading from the vestibule are the news and boys' rooms and the loan department. The news-room, which provides ample accommodation, contains fourteen oak stands to hold four papers, two on each side. The stands, which are of pleasing detail, are fumigated and dusted polished.

In the loan department provision is made for 20,000 volumes. A lift for books is arranged from the book store room in the basement up to the gallery over the reference library on the first floor. By an ingenious arrangement the boy's room generally is well supervised from the porter's box on the stairs. The walls are of aluastone, &c., of the hall and staircase are of Hoplon Wood stone treated with varnish and charming effect.

The first floor comprises magazine, committee, and librarian's rooms, and a reference library with gallery over for extra storage of books. A private entrance in Pitfield-street with staircase in connexion, leads up to the librarian's departments on first and second floors.

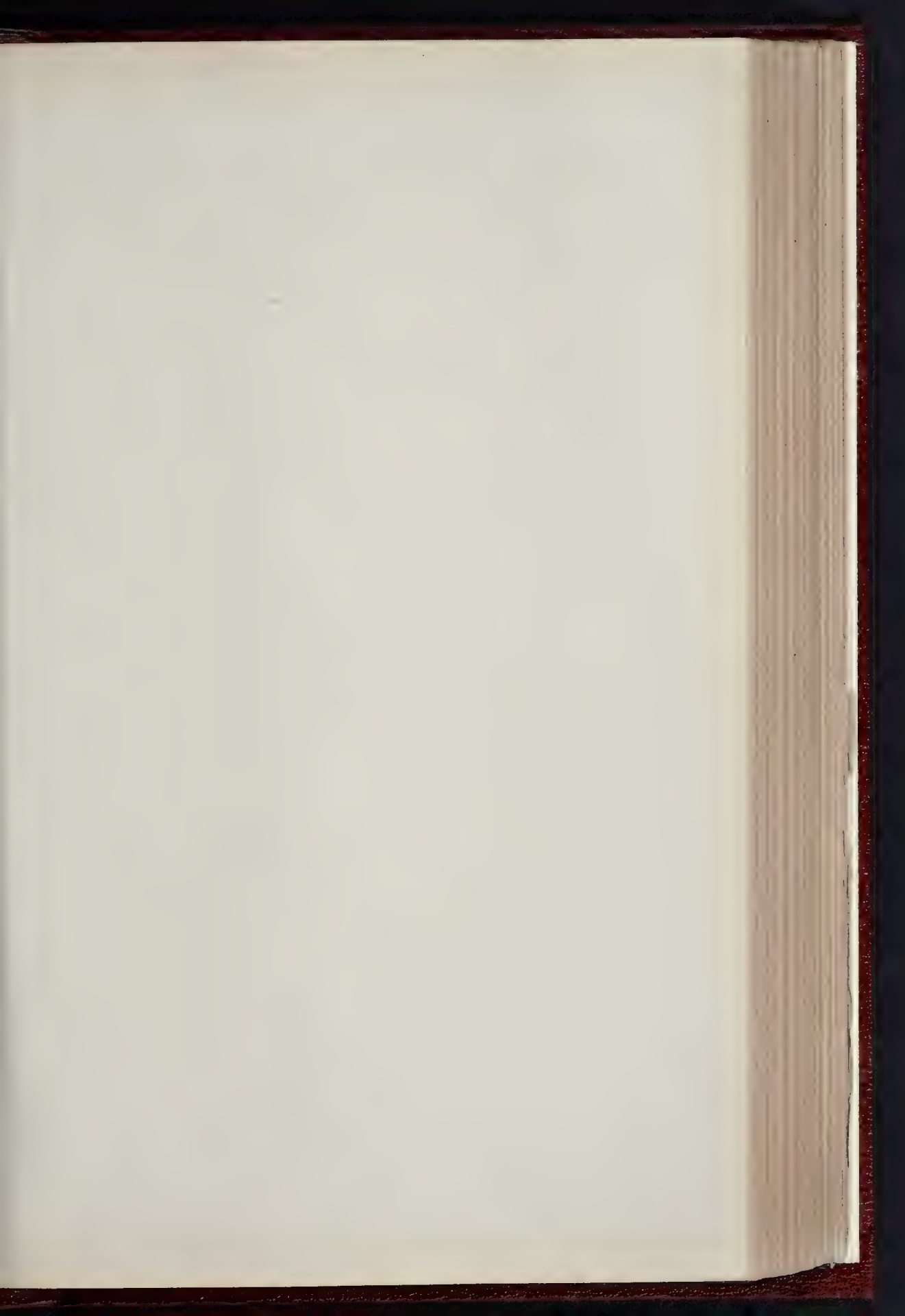
The details throughout of panelling and woodwork are charming, and the electric light fittings were generally admired.

The basement contains a book store under the libraries, a room for bookbinding, a station common room, lavatories, &c. The woodwork is white enamelled, with distempered walls, the general effect of which is admirable.

In addition to the fireplaces which are placed in several of the rooms, the heating is generated by the exhaust steam from the electric light station.

Externally, T.L.B. bricks have been used with buff terra-cotta dressings, and tile roofs.

Bearing in mind the recent visit of the Association to the New Cross Baths, additional interest attached to the present visit at Shoreditch. The baths and washhouses, which have been carried out from the designs of the joint architects, Messrs. Spalding & Cross and Mr.



THE BUILDER, APRIL 16, 1898



EXTERIOR VIEW.

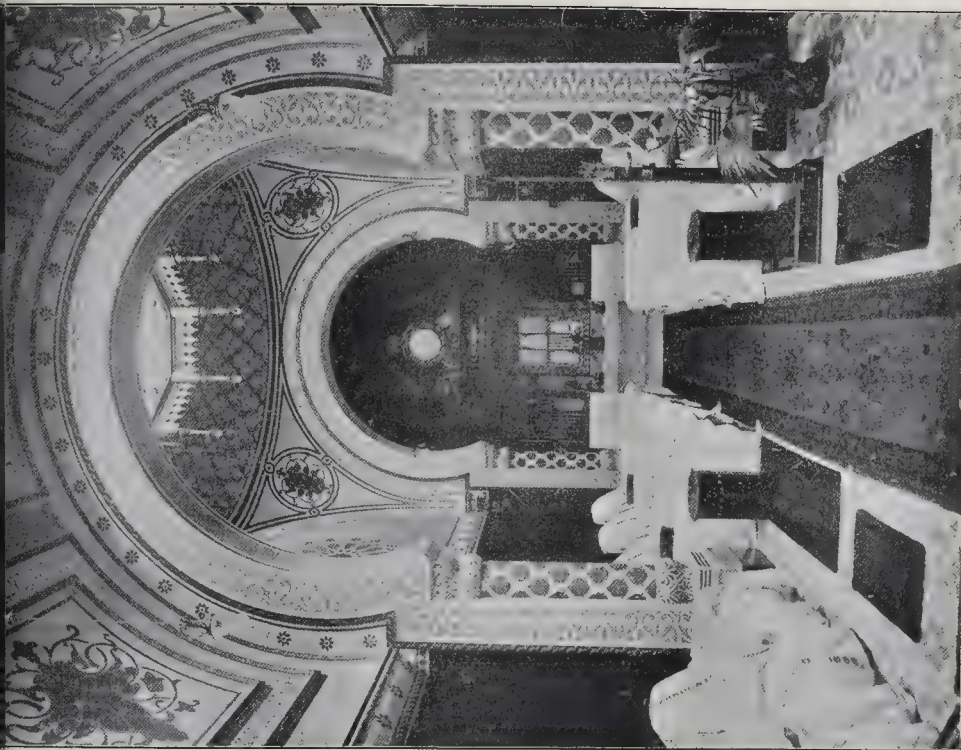




Art. Valentine & Sons, Photo, Fowler.

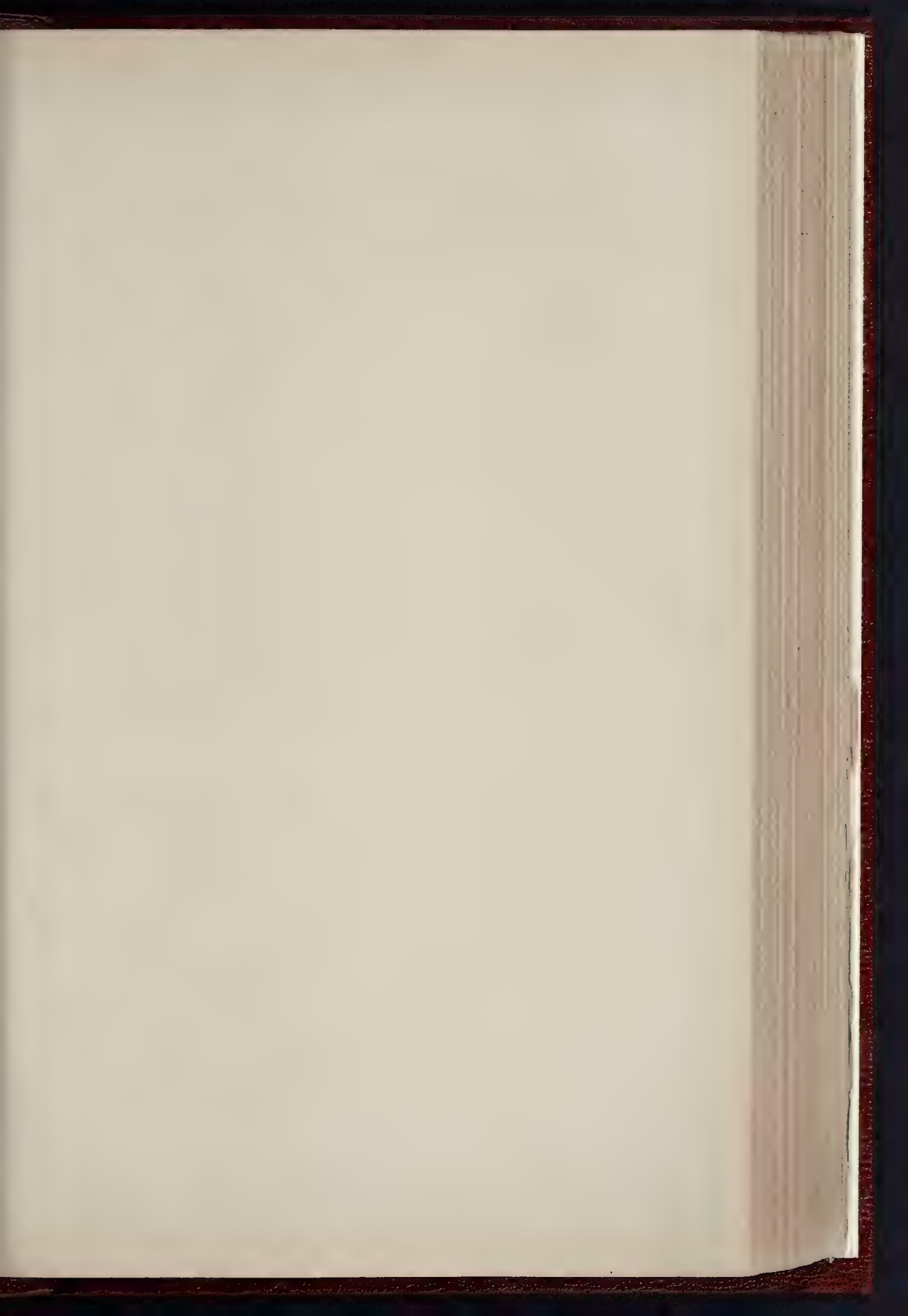
THE CENTRAL HALL.

THE NEW BATHS, HARROGATE.—MESSRS BAGGALLAY & BRISTOWE, ARCHITECTS.

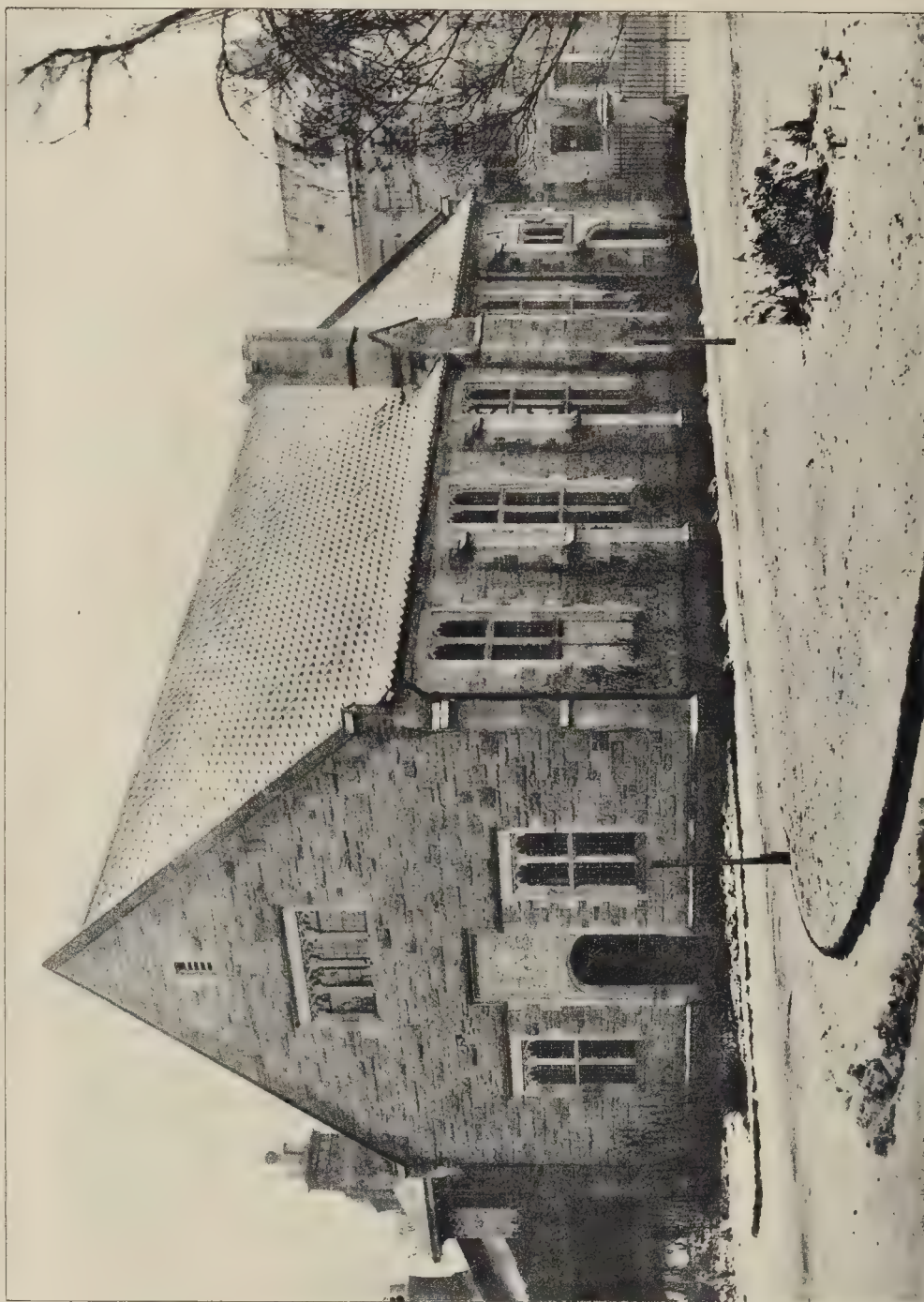


Sprague & Co, Ltd., Tpp., London.

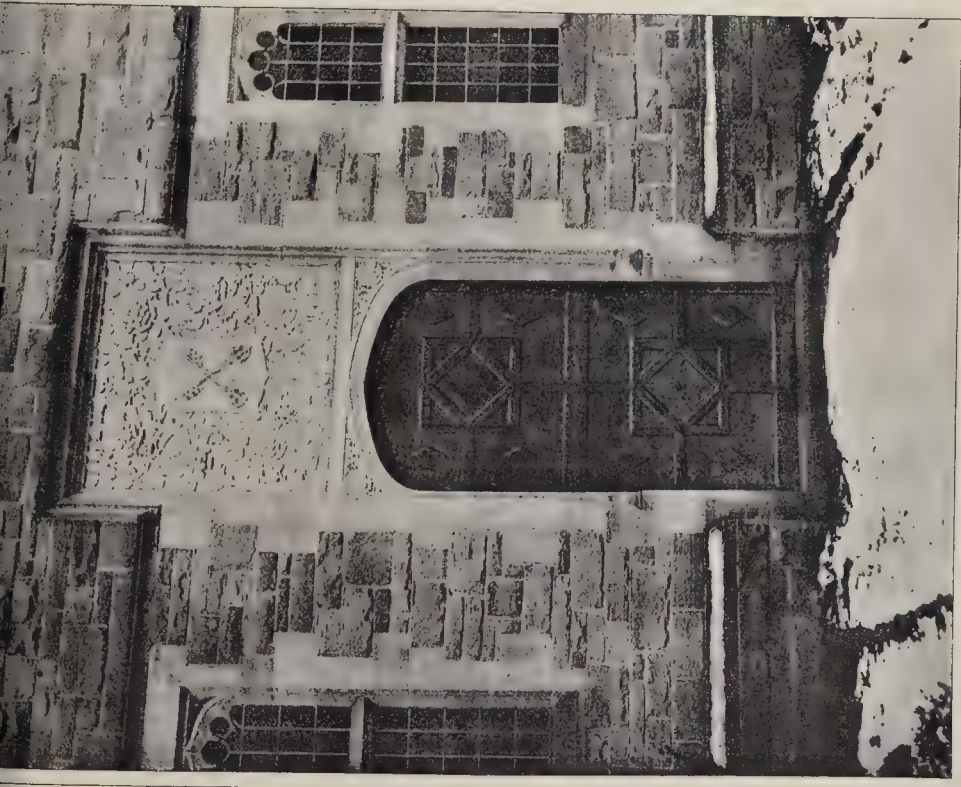
THE TURKISH BATH.



THE BUILDER, APRIL 16, 1898



GENERAL VIEW.



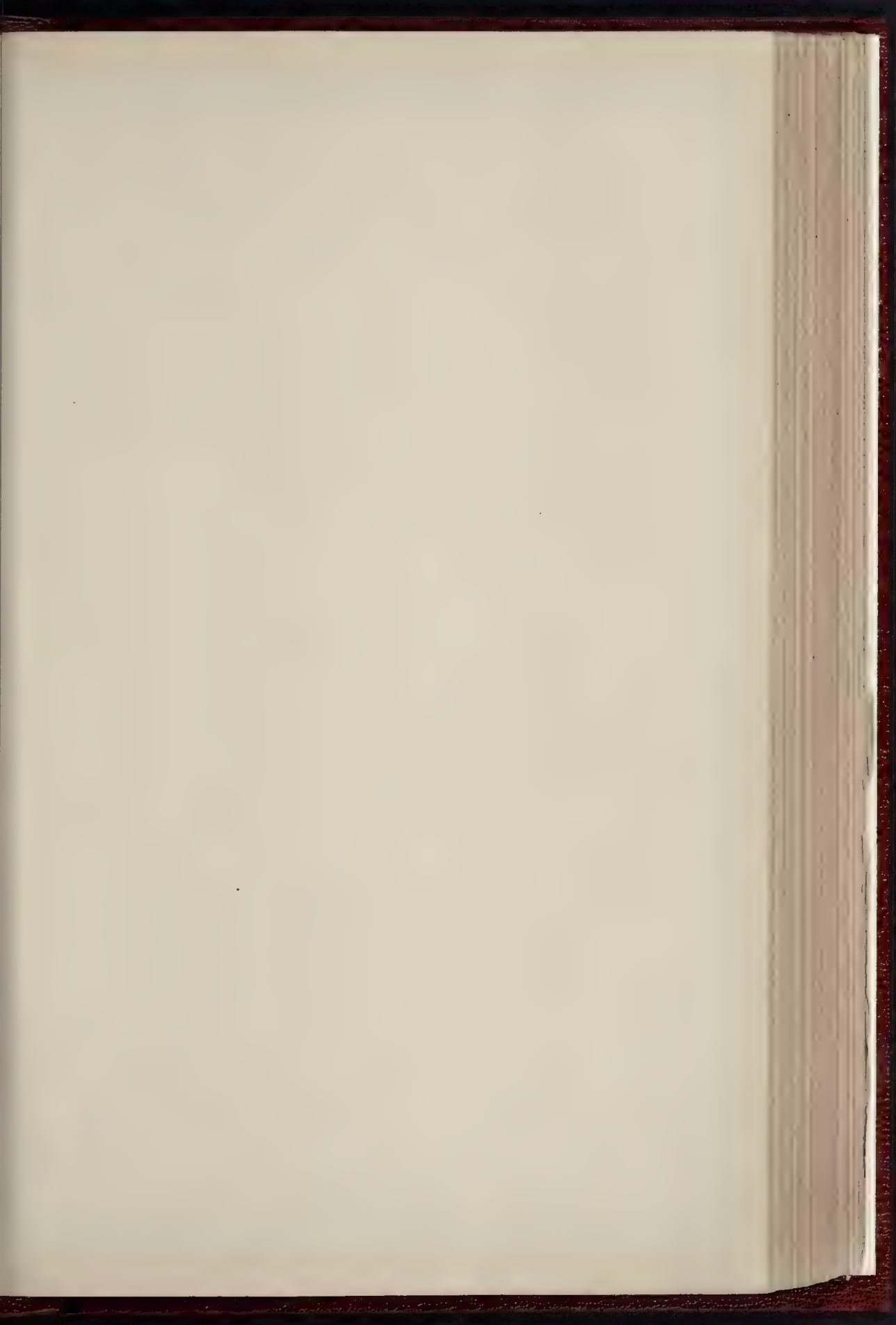
DETAIL OF END ENTRANCE.



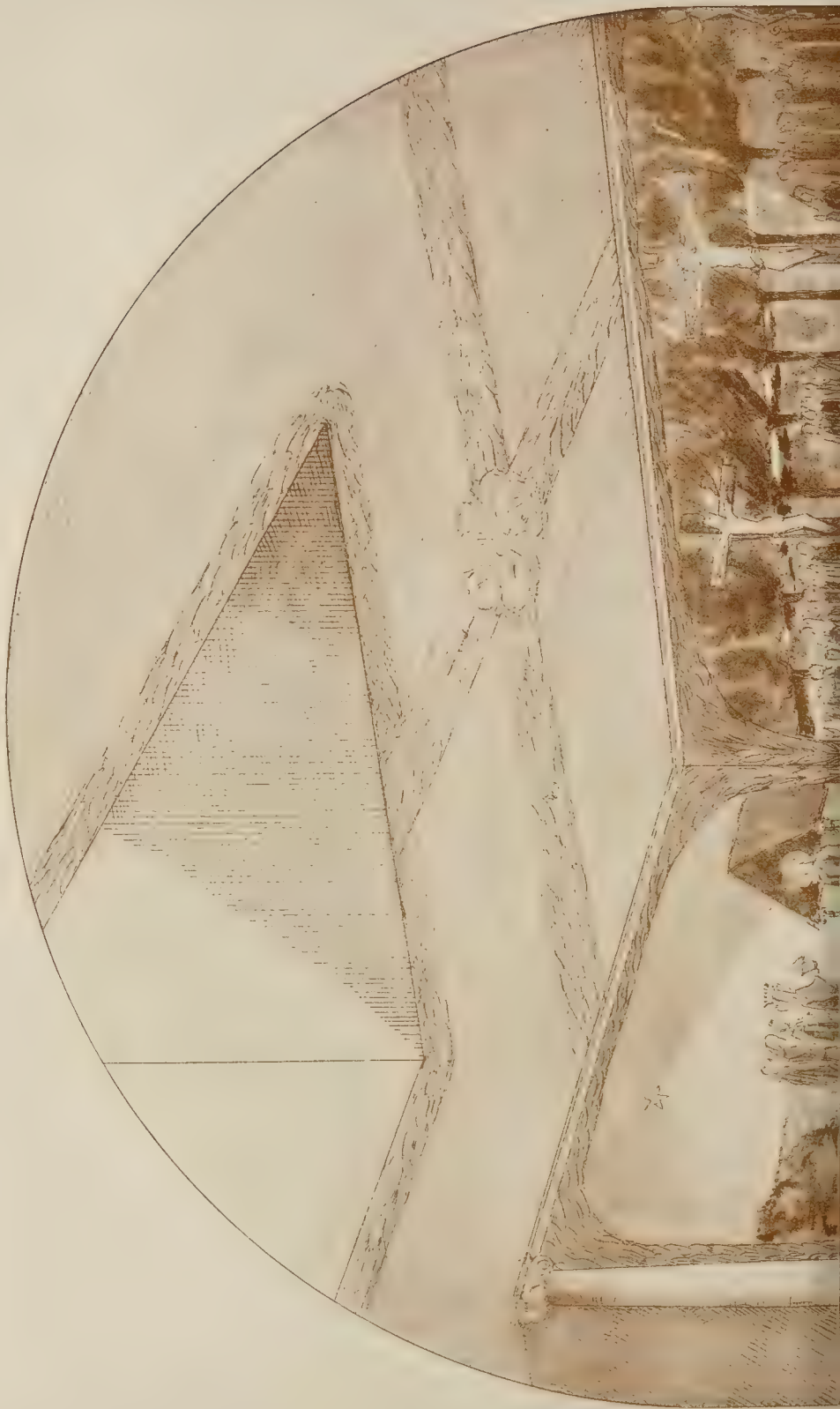
DETAIL OF SIDE ENTRANCE.

BY PHOTO SURVEY & C. LTD. 44 & 45 EAST HADDING STREET, LONDON, E.C.

NEW GYMNASIUM, ST. PETER'S SCHOOL, YORK.—MR. F. W. BEDFORD, A.R.I.B.A., ARCHITECT.

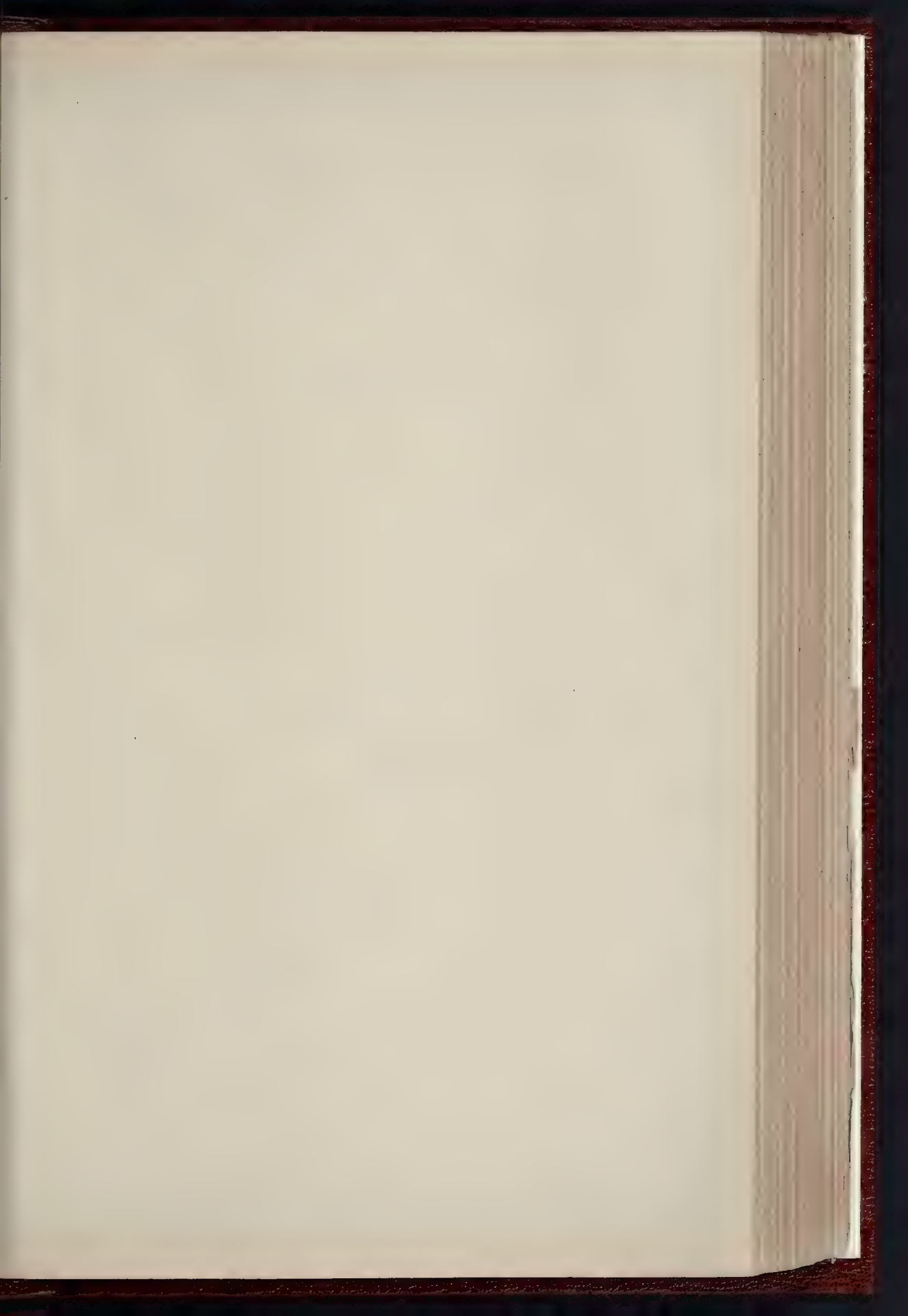


THE BUILDING APRIL 15, 1898

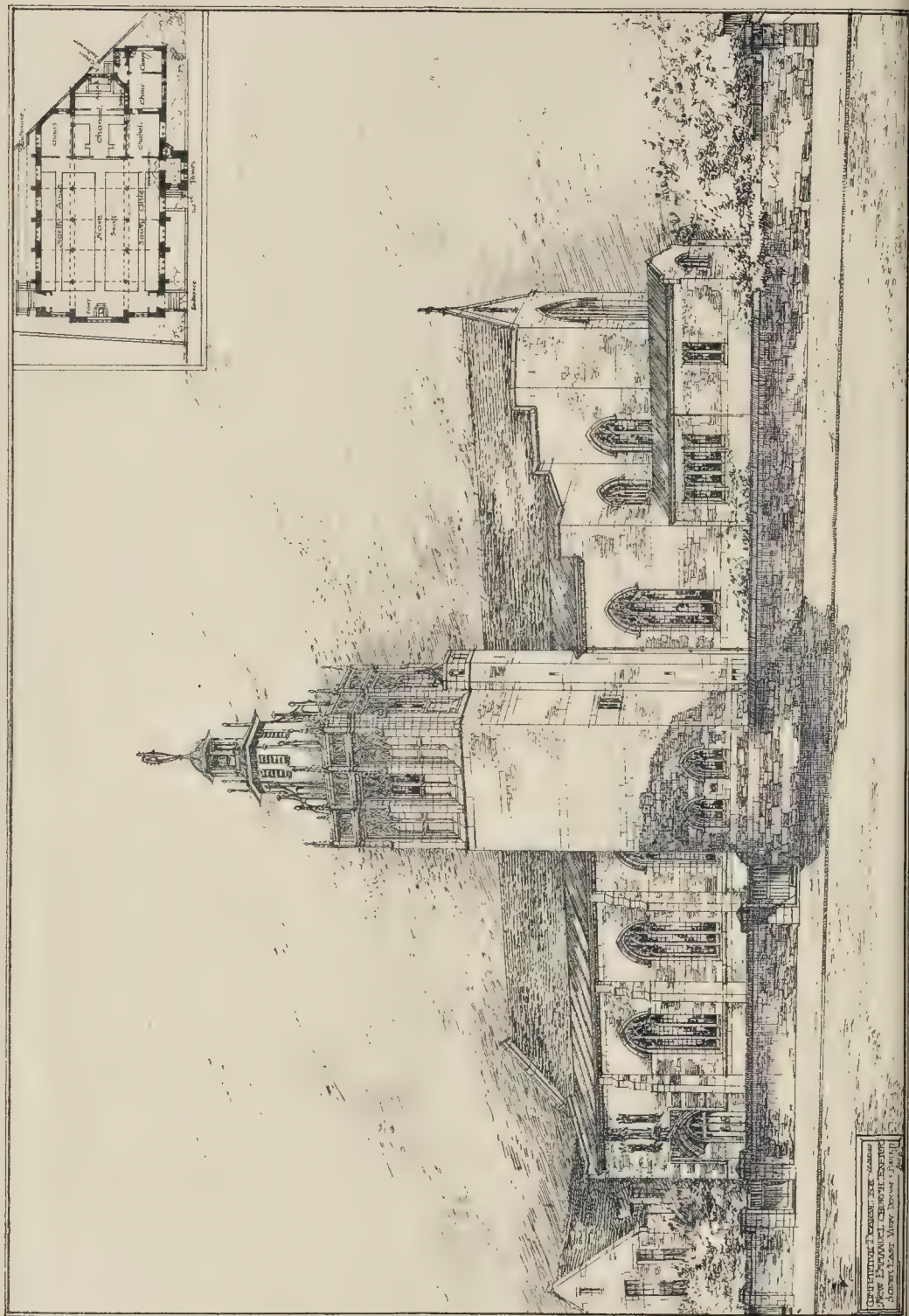




PROPOSED SCREEN AND DECORATION FOR ALL SAINTS CAMBRIDGE. CIRCUS. W.C. B.M. G. J. I. 1880.



THE BUILDER APRIL 16, 1898





PHOTOGRAPH BY SPRAGUE & CO. 425 EAST HAD. ST. ST. LEONARDS-ON-SEA, SUSSEX.

CHURCH OF ST SAVIOUR ST LEONARDS-ON-SEA. MESSRS W H & J D MURRAY, ARCHITECTS

H. T. Hare, include the following accommodation:—

First-class swimming bath, 100 ft. x 40 ft.
Second-class swimming bath, 75 ft. x 35 ft.
Twenty first-class (men's) full size slipper baths.
Thirty-six second-class (men's) full size slipper baths.
Five first-class (women's) full size slipper baths.
Fifteen second-class (women's) full size slipper baths.

An establishment laundry, with eighteen drying-horses and two centrifugal wringers.

Public wash-house, with fifty washing stalls and fifty drying-horses, and four centrifugal wringers and machinery.

Board room, 27 ft. 6 in. x 14 ft.

Caretaker's residence, superintendent's office, &c.

The buildings, which are rapidly approaching completion, have been carried out by Mr. C. Gray Hill, of Coventry, whose contract for the work amounted to 35,393l.

Books.

*Unsere Hochschulen und die Anforderungen des
Zwanzigsten Jahrhunderts.* VON A. RIEDLER.
Berlin: A. Seydel, 1898.

HIS pamphlet seems to be an outcome of the modern democratic movement for popularising University teaching. It is the development of a thesis that may be briefly stated thus:—The times of purely abstract and of purely practical education are over. The abstract scientist and the unscientific "practical" man alike are out of date. The Universities fail in answering the requirements of modern life, for they regard knowledge as in itself the end and not the means.

The author admits that the pursuit of knowledge for its own sake is excellent; he claims, however, that it is insufficient. Etymologically, a University should be concerned with everything, and knowledge for practical purposes should be taught as well as abstract science.

"There was no science," he says, "in the stone, the bronze, and the early iron ages; he has forgotten the copper age," but everything with which man occupied himself was "technical"—an ingenious appeal to archaeology, but scarcely in accordance with our modern knowledge of the psychology of early man, who busied himself with crude abstract speculations whenever the struggle for existence gave him a breathing space. Elsewhere the author says "people built and sailed in ships before the days of scientific navigation, quarried before geology, made steam-engines before the theory of heat was formulated," and so forth.

This is no doubt true; but the contention of the author rests on an almost universally believed fallacy. By all means let technical schools be established and well endowed, and by all means get rid of the rule-of-thumb "practical" man as soon as possible. But the argument in favour of grafting technical schools on the existing Universities is (except for one reason) regrettable, for it leads the University away from what is its chief function. Strictly speaking a University should be an institution where laboratories, libraries, the advice of trained specialists, and, where necessary, pecuniary assistance is available for those pursuing original research in the various departments of knowledge. Their development into large finishing schools whether in the ordinary subjects of study, or in modern technology, would be subversive of their proper purpose and therefore an evil; though unfortunately necessary on account of the inadequacy and depreciation of their endowments. If there were any prospect that a material increase in the available funds of the Universities would result from the establishment of technical schools within their precincts, then Herr Riedler's schemes might be considered; but even then it is doubtful whether the ultimate loss might not be expected to outweigh the immediate gain.

Deshasheh. By W. M. FLINDERS PETRIE, D.C.L. The Fifteenth Memoir of the Egypt Exploration Fund.

THE memoir of the Egypt Exploration Fund never fails to be interesting; perhaps this year has even excelled itself. Three important tombs, and a large number of others of less importance, at Deshasheh, in the Fayum, have been examined. This is not the place to dwell upon the important ethnological results of the year's work; especially the singular discovery

of the survival of a savage custom of dismembering the bodies before interment, even when the early civilisation of the country was at its height. We are here concerned with the light that may be shed, by the remains discovered, upon the history of architecture; and in this connexion the most important of the tombs investigated—that of Anta and his wife Minmert—is of some interest. For Anta, besides numerous military duties, held the post of "Superintendent of the royal tomb"—that is, practically, court architect—fifty-five centuries ago. On the walls of his sepulchre are depicted scenes in his life and occupations; the most interesting being the representation of the capture of a fortress. This is the earliest battle-scene known, and is a fine spirited composition, free to a large extent from the excessive conventionalism that spoils so much of Egyptian art. The most remarkable of the other finds is the great group of statues found in the third of the three principal tombs. It is impossible to suppress a regret that this superb series could not be kept together in one museum, no matter how inaccessible, instead of being scattered between Cairo, London, Liverpool, and America. In the pathetic face of Nenkeftka the artist had a noble subject; the head of his second statue is one of the most beautiful works by an Egyptian sculptor we have ever seen.

Specifications in Detail. By FRANK W. MACEY. London: E. & F. N. Spon, 1898.

THIS work is really something more than a guide to the writing of specifications, inasmuch as it attempts and in some measure succeeds in giving a great amount of practical information as to the details of construction on points which are not usually to be met with in text books. It may, therefore, be looked upon as a guide to the young architect in practical matters, quite as much as a model for specification writing. It indeed attempts to furnish the novice with the knowledge that he ought to possess before he sits down to write a specification. Regarded from the view of practical experience there are, however, many suggestions which are open to question, and which rather lead one to suppose the author has not had that amount of practical experience which would render him a reliable guide on all occasions.

To particularise all these would be impossible within the limit of space which we can devote to a review; but we may give examples of some of these as a warning to the novice that he must not take everything as completely trustworthy because it may appear in the book. Some of the clauses included are rather amusing, as, for instance, the stipulation that "the contractor is to visit the site and make himself thoroughly acquainted with the nature and requirements of the case, so that no item may be omitted from his estimate, though not specifically mentioned in detail." He is also to read through the conditions of contract and to allow for any additional expense to which he may be put, owing to the special nature of the work, &c. It is hard to conceive any contractor of ordinary experience making a tender without observing these elementary precautions.

The author defines his standpoint by laying it down that the specification "should embody every item of work which may in any way affect the estimate"; this is a perfectly good ground to take, but, assuming that the estimate is to be made by a number of builders in the ordinary way, we fail to see the utility of specifying that the estimate is to include for all work done previously to signing the contract. Many of the clauses, in fact, would be far better included, and should find a place, in the bills of quantities, if these are supplied. They are certainly out of place if the specification is to be viewed as the guide and director of the contractor and his workmen in carrying out the work. It is surely contrary to the usual and best practice to stipulate that "the contractor shall at his own expense make copies of all drawings, specifications, and details required for the work," even though "due facilities will be afforded for this purpose." Perhaps this is one of the devices by which some architects endeavour to make very small fees pay for the work they do. The statement that men's lodgings and travelling expenses are only required when a town contractor is required to do work in the country is clearly inaccurate, as it is not altogether an unknown occurrence

* Mr. Griffiths, in his chapter on the inscriptions, makes this name *Mert Min*; but to our eye the hieroglyphs seem rather to favour the reading *Minmert*, which is adopted by Professor Petrie.

for country contractors to do work in town, and to bring with them country workmen whose lodgings and expenses they arrange for without any stipulation in the specification.

Clause No. 20 of preliminary items seems to have got into its wrong place; it is presumably meant only to refer to the mixing of concrete, with which it should therefore be included.

Clause 22, stipulating that the framing and putting together of all work is to be approved by the architect, if carried to its logical conclusion, would render the present book almost unnecessary. Surely the drawings and specification between them should accurately describe the way in which the work has to be framed and put together.

The wonderful word "best" is defined, but it would very seldom happen that the definition given would be adhered to.

We must protest in the interest of fair play against the advisability of including such a clause as "the contractor is to satisfy himself that there has been a sufficient amount taken in the bill of quantities for everything necessary to carry out the contract in accordance with the specification, the drawings, the dimensions, and the architect's requirements." That such a clause should even be suggested indicates that there must be some practitioners who, after supplying quantities and being paid for them, endeavour to shelve all responsibility for the accuracy of their work, a responsibility which is the sole justification for the rate at which the preparation of quantities is remunerated. If the man who supplies the quantities is not ready to take the responsibility for the accuracy of his work, one half the usual fees would be very ample remuneration. But we fear that it is too often the case that a high percentage of payment frequently carries with it very little accuracy. There are architects, we believe, who supply their own quantities and charge 2½ per cent., disclaiming all responsibility for work which highly-qualified quantity surveyors would be very pleased to do for 1½ per cent., and guarantee the accuracy of their work or pay for any losses that might be sustained by the builder in consequence of errors.

As examples of some of the practical knowledge in which the book is defective, we note that the statement of the lengths in which drain pipes are made by modern manufacturers is incomplete. The author's statement as to Professor Barff's process has unfortunately not been borne out in our experience. Flushing out drains with lime water is a futile device; dry lime should be brushed through the drains. The sizes of cesspools which appear to be indicated are too large for good sanitary practice. It should be regarded as an axiom that when cesspools must be used they should be made as small as possible and frequently emptied. The use of Portland cement for underpinning is a very questionable expedient.

Space, however, forbids us to notice all the points which are open to question, and there is so much that is excellent in the book and so many things explained, of which the young architect would have much difficulty in finding a description in any other books, that we do not wish to convey an unfavourable impression as to the value of the work. We hope that wider experience, either of his own or of others, and careful attention to grammatical errors and printers' mistakes, will enable the author to make a future edition all that is admirable in such a work.

Spon's Architects' and Builders' Price Book, with Useful Memoranda and Tables. By W. YOUNG, architect. London: E. & F. N. Spon, Limited, 1898.

THE "Useful Memoranda and Tables" mentioned on the title-page are a distinctive feature of this work, and occupy a considerable portion of the book, placing it in a unique position in the group of price-books. They take in an immense variety of subjects, including Design, Construction, and Law, and will be found of great value in the hundred and one queries that are continually cropping up in an architect's practice. The alphabetical arrangement of these memoranda makes them easy of reference—an important point in work of this kind. Especial mention is due to the notes upon the various building stones, in which are given particulars of the composition, colour, size of blocks obtainable, the prices at quarry and in London, and a list of sundry works executed in the various kinds. These notes, which have been a feature in the work for

some years, will be found of great assistance in directing one's inquiries when in doubt as to the stone to be specified in a district which is possibly new to the architect.

In the "pricing" portion of the work, the mason has also received special attention, the author giving a very complete set of prices, which embraces varieties of stones which are not frequently found in price-books.

Another useful feature is the prime cost of carpenters' and joiners' materials, on pages 225-234.

No price-book seems complete without a chapter on "electric lighting," and this work is not behindhand in this respect.

While, as a price-book pure and simple, this work is not quite so complete as some others we have noticed, taken as a whole, it will be found useful on account of the variety of reliable information given.

The Law and Practice Relating to Workmen's Compensation and Employers' Liability. By ELLIS HILL, Barrister. London: Waterlow & Sons, Limited. 1898.

THIS is a more elaborate work than those on the Workmen's Compensation Act, 1897, which have recently come under our notice. It contains two parts—a text which contains a discussion of the various matters embraced under the term "liability of employers," and a second part, in which the several Acts of Parliament are given upon which now, to a large extent, the existing law is based. This is a book which can confidently be recommended to lawyers and to all those who desire to go into this subject exhaustively. At the same time, it must not be supposed that it is a voluminous work—it could not with advantage have been shorter, having regard to the object which the author has put before himself. So much has of late been written in these columns and elsewhere on this subject, that it is sufficient now for us to indicate our favourable opinion of this work.

The Standard Electrical Dictionary: a Popular Encyclopedia of Words and Terms used in the Practice of Electrical Engineering. By T. O'CONNOR SLOANE, A.M., E.M., Ph.D. Second edition, with Appendix to date. London: Crosby Lockwood & Son. 1898.

THE title to this work very fairly describes its object, and it can be commended as a concise and practical book of reference. Although it extends to nearly seven hundred pages, we have noticed hardly any matter that could be omitted with advantage; the definitions are short and accurate, and the illustrations will be useful to the general reader. The book would be improved if the fifty pages of appendix were incorporated in the text, but very complete indices minify this drawback. The only serious omissions which we have noticed are in connexion with the technical terms used in electric traction work. It would be an improvement in the next edition of the book if the various kinds of "cars" and "frogs" used in overhead construction were described, and also what a "controller" is, and how "nose-bar" suspension of a motor differs from "side-bar."

The Practical Management of Engines and Boilers. By WILLIAM BARNET LE VAN. London: Kegan Paul & Co., Limited. 1897.

THIS little book has been written to assist engineers and those in charge of machinery in acquiring a correct knowledge of all the more important matters relating to engines and boilers. It deals with the production and use of steam, and explains very clearly those leading principles without a knowledge of which it is impossible to manage machinery in an efficient manner.

Of course, the greater part of the information to be found in the book has already often been given elsewhere, but the author only claims to have arranged what is already known concerning the subject in such a way that it may be serviceable to the practical man who has no time to consult learned treatises written by authorities on these matters. In this respect Mr. Le Van has been quite successful, since the book contains in a concise form all the information on the subject that a practical engineer is ever likely to require.

Transactions of the Society of Engineers for 1897. London: E. & F. N. Spon. 1898.

THE volume of "Transactions" of the Society of Engineers for last year contains some

half-dozen papers on various engineering subjects, all of which are of general interest. Mr. James P. Barber's notes on the proposed by-laws of the London County Council with respect to house-drainage was followed by a lengthy discussion, and forms a very good summary of all that can be said on the subject. Mr. R. E. Middleton read a paper on the "Pollution of Water and its Correction," which was awarded the Rawlinson Premium; and Mr. P. M. Faraday contributed a paper on the "Rating of Engineering Workshops," both of which will be read with advantage by those interested in either of these matters.

TRADE CATALOGUES.

MESSRS. HAYWARD BROTHERS & ECKSTEIN send us their illustrated catalogue of "improved circular and straight wrought-iron staircases," the special improvement claimed being that tread, riser and spandril of each step are made in one, giving greater stiffness than when the step is built up in three pieces. A large number of illustrations of straight and circular iron staircases are given, also general drawings and details of wrought iron windows and doors, &c.—Messrs. Hartley & Sugden (Hull-fax) send us the French edition of their new catalogue of boilers for low pressure steam heating, of which the English edition is in preparation. One special point in regard to these boilers is that no rivets are employed in them, all portions being welded, so that there is no danger of leakage from the effects of expansion and contraction. Both the pressure and the combustion in these boilers are automatically regulated. The fuel, as shown by the section of one of the boilers, is fed at the top into a central vertical reservoir, and descends as the lower portion is consumed on the grate. The reservoir can be made to feed the fire for from six to fourteen hours without attention, as required. The illustrations are beautifully executed, being in this respect quite above the average of illustrations to this class of catalogue.—Messrs. Lumby, Son & Wood (Hall-fax) send us the illustrated catalogue of their "Pioneer" boilers, made from Siemens' mild steel boiler plates, solidly welded together, without seam or joint. The outer jacket can be removed by taking out a few screws, leaving all the tubes open for cleaning or repair. The tubes are specially constructed with square lower ends in order that they may be put in and taken out with an ordinary spanner. All sizes are constructed to burn through the night without attention.—Messrs. Cole, Marchant, & Morley (Bradford) send us their illustrated catalogue of the different types of steam-engines, condensing plants, and other machinery constructed at their works. The engines described are of various kinds, and much reliable information is given concerning their capabilities to facilitate the selection of those best suited for any required purpose. We have seldom seen a catalogue so carefully compiled, and much practical knowledge regarding the class of machinery above referred to can be obtained from its pages.—Messrs. Dobsons & Curtis Bros., Limited, of Dublin, send us their illustrated catalogue of electric bells, telephones, medical supplies, &c. The numerous tables given to enable customers to send in estimates for fitting up electric bells and telephones in houses and offices of all sizes form a special feature which will be much appreciated by those firms which do only a limited business in electrical accessories. It will enable them with very little trouble to send in estimates for the latest systems and the most modern apparatus. The general inter-communication system for telephony described in this catalogue would be a suitable one for large warehouses, as each station can be called from every other one irrespective of the position in which the switch arm has been left by the last user. It has a great advantage over those systems in which it is necessary (when the conversation is finished) that the switch lever return to the home station stud either by hand or automatically.—The N.A.P. Window Company (Westminster) send us their large catalogue, which, as a catalogue dealing only with windows and their accessories, they believe, and we think with reason, to be unique. The catalogue consists of more than 450 pages, giving every information as to the various classes of windows made by the Company, with full constructive details shown in section. Of the merits of their patents in window making and sash hanging we have before

spoken highly. We observe, as a kind of appendix to the catalogue, that the Company have secured the co-operation of Mr. G. C. Halls in the working of their artistic metal department, and some exceedingly clever sketches by him for wrought-iron grilles, &c., are included.

BOOKS RECEIVED.

ELEMENTARY CHEMISTRY.—By T. A. Cheetham (Blackie & Son).
PUBLIC WORKS IN LANCASHIRE, 1863-66. (P. S. King & Son).

Correspondence.

To the Editor of THE BUILDER.

FIRE AT NEW BRIGHTON TOWER.

SIR,—We have had our attention called by several people to a statement which has appeared in many newspapers that a serious fire had occurred at New Brighton. As architects for the building, we shall be obliged if you will kindly state that a fire did occur on the evening of Friday last, but that the fire originated on a workmen's scaffold 172 ft. from the ground. Several of the planks of this scaffold were burnt, and in falling on to the building below set fire to a little woodwork, but beyond this no damage whatever was done, and, in fact, with the exception of the workmen's scaffold that was burned, we doubt if more than 10l. worth of damage was done altogether. The fire will not in any way delay the progress of the works, or affect the stability of the structure.

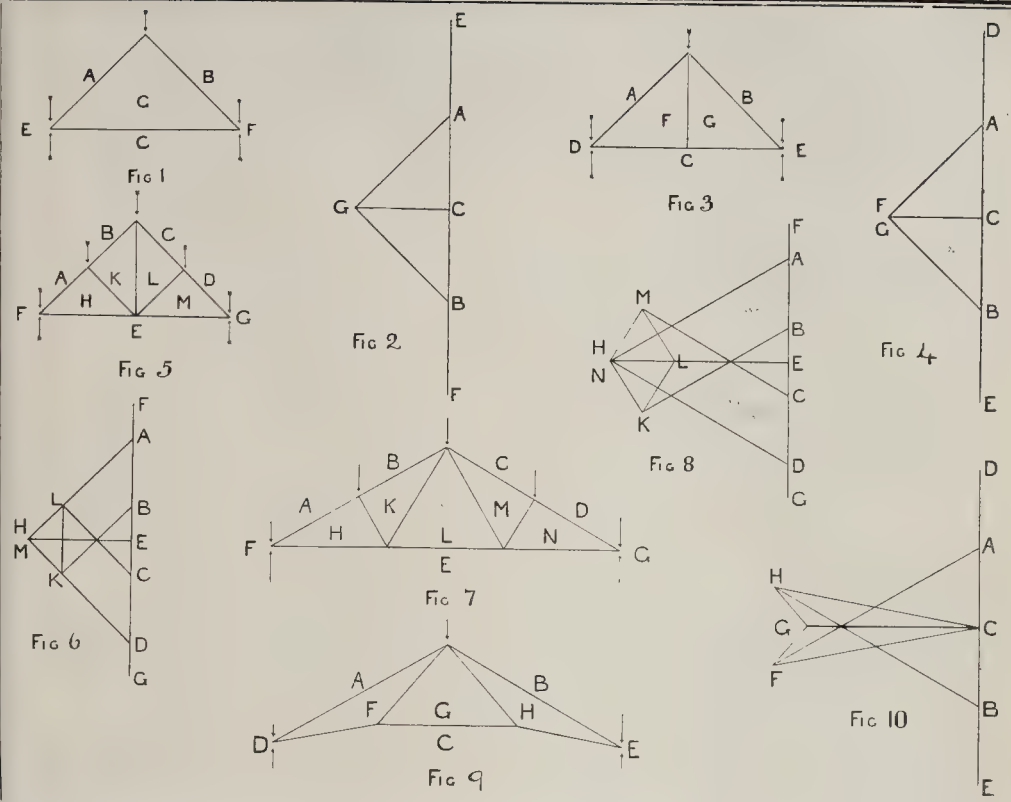
Manchester, April 7. MAXWELL & TUKE.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XV.

WE will proceed with some further examples of slightly more difficult character. In Fig. 1 we have a similar truss to that which we considered in our last chapter, but in this case we will suppose the weight distributed over the rafters instead of being concentrated at the apex. The weight being distributed over the rafters half of the load on each is carried to the apex of the truss, and half to the point of support on the wall. We have, therefore, the weight of the roof distributed at three points, forming three forces and with the reaction of each support making together five forces in all, as indicated by the arrows. Commencing as before, we letter the spaces between the lines indicating the action of the loads A and B, the space between the lines indicating the reactions C, the spaces left and right of the vertical lines denoting the direction of the loads and reactions at the points of support E and F, and the space enclosed within the truss G. Proceeding then, as in fig. 2, with the reciprocal diagram, and beginning with the forces which we know, we draw EC, CF to scale representing the magnitude of the reaction of the supports. We also draw to the same scale EA, FB representing the magnitude of the portions of the load carried directly by the supports, then AB represents on the same scale the magnitude of the load at the apex. We then draw AG and BG parallel to the sides of the truss, and CG parallel to the horizontal member or base of the truss. Then as before, AG, CG, BG, represent in magnitude and direction the forces in the various parts of the truss to which those lines are parallel.

We will next take a similar truss, but with a king rod, as shown in the diagram, fig. 3. Lettering our spaces as before A, B, C, D, E, F, G, our reciprocal diagram is also similar, but we find that A, F, and B, G, meet at same point, and from this we learn that there is no strain, from the weight of the roof, in the king-rod, as the line F, G, has no length, and is merely a point. The king-rod therefore supports the weight of the tie, but receives no stress from the roof load. From this we can proceed to the ordinary form of a king-post truss, as in the frame diagram, fig. 5. The load of the roof is in this case distributed over a number of points, namely, the apex, the points of junction between the rafters and struts, and the points of junction between the rafters and tie. The vertical loads at these points, together with the reaction of the supports, give us seven known forces whose direction is indicated by the arrows in our



frame diagram. We accordingly letter our spaces A, B, C, D, E, F, G, H, K, L, M, and proceed with our reciprocal diagram shown in fig. 6, thus:—We set out the reactions at the points of supports to scale on the vertical line FE, EG, and the vertical loads FA, AB, BC, CD, DG, taking care that the lengths on the reciprocal diagram between any two letters, as FA, for instance, represent to scale the load in the frame diagram between the same two letters. Then, from A we draw AH parallel to the line between A and H in the frame diagram, from B we draw BK, CL from C, DM from D, and finally EH (or EM) and KL. Then, as before the lines in the reciprocal diagram represent the stresses in the truss in magnitude and direction.

In fig. 7 we have another form of roof-truss, and one frequently employed in iron or steel roofs; but the method of proceeding is exactly similar to those examples we have already worked. First we letter the spaces in the frame diagram, A, B, C, D, E, F, G, H, K, L, M, N; then in our reciprocal diagram we draw FE, EG, representing to scale the reactions of the supports, and FA, AB, BC, CD, DG, representing the parts of the load; then parallel to the members of the truss we draw AH, BK, CM, DN, EH, EL, EN (these last three are in the same horizontal line, as they refer to parts of the horizontal tie rod), HK, KL, NM, ML.

In fig. 9 we have an example with the tie-rod not continuously horizontal, but the working is exactly similar, and in our reciprocal diagram, fig. 10, we have three lines from C, CF, CG, CH parallel respectively to the various parts of the tie-rod.

The student will by this time, we hope, have understood the method of procedure, which we may summarise thus:—

1. Draw the frame diagram and indicate the direction and position of the loads and reactions.
2. Letter each space between the directions of the forces and between the parts of the truss.
3. Draw to scale, in the reciprocal diagram, lines representing the magnitude and direction of the known forces in the frame diagram

lettering the ends of the lines by the letters which in the frame diagram are on each side.

4. Draw from the letters marked in the reciprocal diagram, lines parallel to the members of the truss beginning with the parts enclosing the truss and then continuing with the members internal to the truss. We note that in drawing lines parallel to the members of the truss, we have, first of all, the lines of indeterminate length, and that we must draw a second line to cut the first in order to fix the point common to both. For example, in fig. 10 A F is undetermined in length till we draw C F cutting it in F, so with B H and C H, H G and C G.

OBITUARY.

M. CHARLES YRIARTE.—We hear with great regret of the death, on the 7th inst., after a very short illness, of M. Charles Yriarte, officially known as Inspecteur-Général des Beaux-Arts under the French Government, but known to all the world as the first literary writer on art of his day in France. M. Yriarte was born in 1832, and studied architecture in the atelier of Constant Dutilleul. In 1856 he was appointed Inspecteur des Asiles for Vincennes and Vesinet. The suppression of this post subsequently had indirectly the effect of leading him into the path of work for which he was best suited, that of the literary treatment of artistic subjects. After having been the military correspondent of the *Monde Illustré* during the campaign of Morocco and the siege of Gaeta, he became editor of that review, and occupied the post until 1871. During the Franco-German war he was attached to the staff of General Ducrot. After the peace, he travelled in Dalmatia, Montenegro, and in the Balkans, whence he sent a number of interesting articles to the *Temps* and the *Revue des Deux Mondes*. In 1879 Jules Ferry appointed him Inspecteur des Beaux-Arts, in which capacity he took an active part in the organisation of the departments of "Histoire de Travail" and "Arts Plastiques" in the 1889 exhibition, and was on that occasion created "Officier" of the Legion of Honour. After travelling in Italy, he published a whole series of admirable and learned works on the art of the Renaissance: "Les Arts à la Cour de Malatesta," "Souvenirs d'un Sculpteur Italien au XV. Siècle," "Les Portraits des Borgia," "Paul Veronese," "Isabella d'Este," "Sabbioneta," "Autour d'un Concile," "Vie d'un Patricien de Venise au

XVI. Siècle" (a work "couronné" by the French Academy); "Francesca di Rimini," &c. In 1896 M. Yriarte was a candidate for the Académie des Beaux-Arts, when he obtained eighteen votes, and would certainly have been successful at the next election had he survived. M. Yriarte was the artistic adviser and curator of Sir Richard Wallace, and also gave his assistance to the Duc d'Aumale in the arrangement of the Chantilly collection. He was an art amateur and student of a singularly refined critical quality of mind, and in his writings he combined an admirable literary style with research and accuracy. M. Yriarte some years ago contributed two or three important articles to this journal on subjects connected with French art; we may mention especially the essay on the Château of Chantilly, to be found in the *Builder* of July 20 and August 2, 1884.

MR. JOHN THOMPSON.—All the architectural and building world of this country will hear with regret of the death of Mr. John Thompson of Peterborough, the well-known contractor, whose ability and energy in his calling has made the small town of Peterborough one of the greatest centres of building industry in the kingdom. Mr. Thompson died at his residence at Peterborough on Monday morning, at the age of 74. He commenced business as a contractor in a small way at Peterborough, where he was a sub-contractor under Mr. Ruddle of the same town, who carried out a good many works for Sir Gilbert Scott. Mr. Thompson doing the masonry and Mr. Ruddle the other trades. After a while the positions were reversed, from circumstances which may have been partly accidental; Mr. Ruddle got into difficulties, and Mr. Thompson became the general contractor, Mr. Ruddle continuing to work with him. Before this change of position Mr. Thompson had executed some works for Sir Gilbert Scott where masonry only was required, the repairs to Hereford Cathedral being among these. The following are some of the principal works which Mr. Thompson carried out subsequently for Sir Gilbert Scott:—

Hereford Cathedral: general repairs.
Chester Cathedral: very extensive repairs.
Ripon Cathedral: oak-groined ceiling to nave.
Peterborough Cathedral: various repairs, underpinning, &c., extending over many years.
Glasgow University Buildings: (the tower completed after Sir Gilbert's death).
St. Mary's Church, Glasgow: (the tower completed after Sir Gilbert's death).
Crowland Abbey: west front.
Bridlington Priory Church: west front, comple.

Meantime Mr. A. G. Waller, architects, Brighouse, were engaged to supervise the work, and the plans they submitted were approved by the Local Government Board. The general idea of the architects has been to utilise the old corrugated iron buildings for the treatment of scarlet fever, diphtheria, and other similar diseases. In order to prevent the spread of these diseases it was necessary to dispense with the central connecting portion, and to adapt the outer wards for the isolation of persons suffering from these diseases. At a higher level of the grounds is located a new isolation ward, where also typhoid cases will be treated. Altogether accommodation is provided for about fifty patients. The new typhoid fever section consists of a ward with polished hardwood floors, and the floors of the older portion of the hospital are covered with polished linoleum. Between the wards, in each case, there is a nurses' room, with windows which communicate with the two adjoining wards. Baths and lavatories are placed in close proximity to all the wards. The administrative block has a separate approach, and a footpath which runs along the side of the roof of the building contains a room which has been arranged for the Medical Superintendent. Across the vestibule is a sitting-room for the matron, and behind there are nurses' room, store-room, cooking kitchen and scullery. On the upper floors there are eight bedrooms for the accommodation of the staff. On the basement there is a cooking of kitchen. Attached to each of the new hospital buildings is a room with glass roof. In various parts of the grounds are located buildings for quarantine purposes. The contractors who have erected the new buildings have been as follows:—Masons' work, drainage, roadways, and boundary walls, Mr. T. C. Dawson, Lightcliffe; joiner, Mr. T. A. Hirst, Ovingle; plumbing, Mr. C. H. Barraclogh, Brighouse; painters, Messrs. J. A. Firth, Brighouse; patent glazing, Messrs. T. W. Hellwell & Co., Brighouse.

BATHS, HOLBECK, LEEDS.—The third public bath erected by the Leeds Corporation was opened on the 2nd inst. in Holbeck-lane. The building has been built of pressed brick with stone dressings. The central portion is three stories high, with a one-story wing on each side. The floor of the building is raised about 5 ft. above the ground level, and the two entrances are approached by stone steps. Over the offices is the manager's house. The second-class bath has a water area of 75 ft. by 30 ft., and the first-class bath an area of 65 ft. by 25 ft. There is a spectators' gallery on three sides of the second-class bath-room. Altogether about 500 spectators can be accommodated. A score of slipper baths are provided. Five of them are for ladies. A waiting-room, store-room, and attendants' room have been provided. The cost of the Holbeck baths is about 3,500l. Mr. Walter Hanstock, of Leeds and Batley, was the architect, and the contracts were let as follows:—For masons' and bricklayers' work, Mr. J. T. Wright; carpenters and joiners' work, Messrs. G. Oakes & Sons; plumbers' work, Messrs. W. and C. Barrand; engineers' work Messrs. H. Braithwaite & Co.; fire-proofing, Mr. McFarlane; ironfounders' work, Messrs. W. Horsfall & Co.; plasterers' work, Messrs. J. Denton & Co.; slating, Mr. W. Shevill; patent glazing, Messrs. W. Hellwell & Co.; and painting, Mr. Jonas Gault.

UNIONIST CLUB, SWINDON.—A Conservative and Unionist Club, situate in Fleet-street, New Swindon, has just been opened. While the front elevation is in Bath stone, with piers, columns, and dressings of the same material, the club itself is built of local red brick, with slated roof. Inside there are a billiard-room, concert-room (which will seat 250 persons), billiard-room, smoking-room, skittle alley, &c. The architects were Messrs. W. Drew & Sons, of Swindon, and the builder Mr. C. Williams, of Swindon.

ARCADE, NORWICH.—The Old Royal Hotel, Norwich, and the surrounding premises, are being converted, it is stated, into an Arcade. The main line of the Arcade will run from the Market-place to Castle-street, at both of which points there will be entrance gates. The third entrance will be at a point about midway down White Lion-street. Messrs. J. Youngs & Son have signed a contract for the execution of the work, and Messrs. G. J. Skipper & F. W. Skipper are the architects.

RESTORATION OF ST. PAUL'S CHURCH, BIRKENHEAD.—St. Paul's Working Men's Church, Birkenhead, has been reopened. The roof has been lined on the inside with selected pitchpine boards, while the windows have been filled in with cathedral glass. The interior has been decorated from the designs of the architect, Mr. J. C. Ogle, of Birkenhead. A new staircase has been provided, connecting the clergy vestry with the rooms under the church. A lavatory has also been included in the scheme.

OFFICES, WEST HARTLEPOOL.—The new offices of Messrs. Furness, Withy, & Co., Limited, at West Hartlepool, which have been in course of construction during the past twelve months, are now completed. The main entrance is in George-street, there are on the ground floor several private rooms and the general office, a room about 20 ft. by 25 ft. On the first floor is another room of the same size, while another room of equal size is on the second floor. The remainder of the first floor is occupied by a dining-room, serving-room, lavatories, and conveniences. There is a kitchen on the second floor for use in connexion with the dining-room, and also a caretaker's residence. The remainder of this floor being occupied by muniment rooms for papers, &c. There is a basement to the whole building. The offices are heated by hot water on the low-pressure system. A strong room is placed in direct communication with the secretary's room, telephone and typewriting room is situated on the ground floor. The contractors are Messrs. Joske & Co., of West Hartlepool. The masonry work has been executed by Messrs. John Lowes & Sons, of Durham. The architects are Messrs. Barnes & Coates, of West Hartlepool and underland.

BUSINESS PREMISES, MOORFIELDS, E.C.—On the 1st inst. Mr. Raphael Tuck laid the foundation stone of Raphael House, the new premises of Messrs. Raphael Tuck & Sons, in Moorfields. The building will have frontages on Moorfields, Whitefriar, and Tenter-street. Mr. W. H. Nash is the architect.

MAR LODGE.—The new residence for the Duke and Duchess of Fife is rapidly approaching completion. Fine picked specimens of woods from the neighbouring forests have been largely used in paneling, or in making balustrades or doors, and some of the pine and birch is quite clear in beauty of the natural timber. For the entrance hall, staircase, large and small dining-rooms, Messrs. A. J. Crowsmith & Co. are supplying the oak parquet flooring. Mr. A. Marshall Mackenzie, of Aberdeen, the architect, and Messrs. McRobbie & Milne are the contractors.

BANK BUILDINGS, STRATFORD-ON-AVON.—Lloyds Bank (Limited) are about to erect new bank buildings on the site of their present premises at the corner of Bridgeway and Union-street, Stratford-on-Avon. The plans of the new bank have been prepared by Mr. J. A. Chatwin, of Birmingham

The building will provide a banking-room next Bridge-street, with consulting and waiting rooms, strong rooms, and residence for the manager. The elevations in Bridge-street and Union-street will be of Bath stone, and the principal entrance will be at the corner of the streets named, with oriel window projecting over, and surmounted by a short spire. The extent of frontage to Bridge-street will be 42 ft., and that to Union-street 52 ft., and the height to ridge will be 51 ft., with a slightly lower elevation to Union-street. There will be six windows on the ground floor of the banking room, which will be 38 ft. by 20 ft. The builders are Messrs. Collins & Godfrey, of Tewkesbury.

MARKEET, CARDIFF.—At a meeting of the Cardiff Property and Markets Committee recently, the Borough Engineer submitted plans of the proposed fish and fruit market in The Hayes, which he estimated would cost 16,000l. Several members questioned whether such an expenditure would be remunerative. The engineer was instructed to reconsider the matter, and report at the next meeting whether the estimate could not be reduced.

PLANS OF NEW BUILDINGS, ABERDEEN.—The Plans Committee of the Aberdeen Town Council met on the 7th inst., when fourteen plans were submitted, representing a total value of 25,000l. The majority were passed, one or two being deferred meantime. The only noteworthy building on the list was the new Free John Knox Church, which is to be built on the site of the present church at a cost of 4,500l.

UNDERGROUND CONVENIENCE, RICHMOND.—An underground convenience in George-street, Richmond, has just been opened. The estimate of the cost provided for the outlay of a sum of 1,600l., and the contract was entrusted to Messrs. Soole & Son, of Richmond, the work being completed within the estimated price. It is divided into two parts, one for ladies and the other for gentlemen. The convenience was designed by Mr. Brierley, the Surveyor to the Council, and has been carried out under the supervision of Mr. F. B. Drake, the chief assistant in the Surveyor's department.

NEW RAILWAY STATION, ELGIN, N.B.—A new station is about to be erected at Elgin by the Great North of Scotland Railway Company. The new buildings will be constructed of the sandstone of the district. The architect is Mr. P. M. Barnett, Engineer to the company.

CHURCH HALL, MOSELEY.—The new church hall erected at the corner of the Alcester- and Chantry-roads, Moseley, by the local Presbyterians was dedicated on the 1st inst. Messrs. De Lacy Ahern & McKewan, of Birmingham, are the architects.

SANITARY AND ENGINEERING NEWS.

SEWERAGE SCHEME, FARNWORTH.—Colonel A. C. Smith, R.E. Inspector to the Local Government Board, held an inquiry on the 17th ult. into an application of the Farnworth District Council to borrow 22,160l. for works of sewerage and sewage disposal, and 8,000l. for works of private street improvement. Mr. B. Crossley, Clerk to the Council, gave evidence as to the street improvements to be carried out, and Mr. W. J. Lomax, C.E., of Bolton, of the firm of Lomax & Lomax, of Manchester, the Council's Engineer, described the proposed works of sewerage and sewage disposal, stating that the Mersey and Irwell Joint Committee required the Council to improve their effluent. In order to accomplish this it was intended to considerably alter the present precipitation tanks, to construct a range of six roughing filters with an area of 1,800 square yards, and a similar range of Polaris filters, also 1,800 yards in extent, which will be intermittently and automatically aerated by Messrs. Lomax's system. The purified effluent from the filter tanks would be passed on to land to meet the requirements of the Local Government Board. The population to be dealt with at the proposed works is about 26,000. There was no opposition to the scheme.

PUBLIC IMPROVEMENTS AT RHYL.—On the 6th inst., at the Town Hall, Rhyl, a Local Government Board Inquiry was held before Colonel Durnford, R.E., as to the Rhyl Urban District Council's application for power to borrow 1,500l. for the purpose of carrying out sea defence works, and the construction of a promenade 20 ft. wide, at the extreme end of the marine drive, Rhyl. Mr. A. Rowlands (town clerk) and Mr. Robert Hughes (town surveyor) explained that of late years the sea had been making such inroads on the eastern foreshore at Rhyl that the Council considered it was their duty to construct permanent sea defence works in order to prevent the sandhills from being washed away.

PROPOSED MERSEY ROADWAY BRIDGE.—At a meeting of the Liverpool Chamber of Commerce on the 5th inst. Mr. John J. Webster, engineer, of London, explained a scheme which he and Mr. J. T. Wood had prepared for carrying a roadway bridge, 62 ft. wide, over the Mersey from Liverpool to Birkenhead. The proposal is to start in St. George's-crescent, Liverpool, passing over the site of the buildings between and at the rear of the James-street and Red Cross-street properties, turning to the left along Strand-street, then crossing the Lock Pit

between Wapping Basin and Salthouse Dock at an angle, and on to the riverside south of the Manchester Dock, where the east abutment of the proposed bridge would be erected. From this position the bridge would cross the river and be carried to the corner of Hamilton-square, Birkenhead. The estimated cost of land and bridge was 2,750,000l. A resolution was adopted to the effect that such a bridge as that described would be a great advantage to both communities and would materially assist the development of the port.

STAINED GLASS AND DECORATION.

WINDOW, ST. PETER'S CHURCH, MOWBRAY, SOUTH AFRICA.—A large single lancet window has just been completed for St. Peter's Church, the subject of the miraculous draught of fishes filling the central portions, with angels holding scrolls in base and canopy. The work was executed by Messrs. F. Holt & Co., Warwick.

STAINED GLASS WINDOWS, TRURO CATHEDRAL.—Two windows have just been filled with stained glass in the north choir aisle of Truro Cathedral. The subjects form links in the historic series, illustrating the progress of the Church, designed for the cathedral. The windows are the work of Messrs. Clayton & Son.

WINDOW, HUNNINGHAM CHURCH, LEAMINGTON.—The stonework of the east window in this church has been taken out, and a new two-light window, with tracery, erected and filled with stained glass. The work has been carried out by Messrs. Holt & Co., Warwick.

FOREIGN.

FRANCE.—M. Adrien Chancel, who is this year the sole candidate for the prize founded by the late architect Duc, with the view of encouraging architectural studies, has submitted to the Académie des Beaux Arts the drawings of the Hôtel de Ville, which he has built at Ivry-sur-Seine, and the cartoons for the decorations for the new Salle des Fêtes at the Palais de l'Elysee. The award is not made yet.

The celebrated Vellica statue by Maillardon has been withdrawn from the Luxembourg garden, and its place taken by the statue of Margaret of Anjou.—An exhibition of the works of Daniel Vierge is open in the Salons de l'Art Nouveau, 28 Rue de Provence.—The frescoes by Chassériau, which we mentioned as recently removed from the Cour des Comptes, have been placed in a gallery of the Louvre.—It is probable that the works for the prolongation of the Orleans line to the Quai d'Orsay will necessitate the displacement of the statue of Voltaire near the Institute, which will then be removed to a site near the Pantheon, to form a pendant to the statue of Rousseau.—M. Guilbert, architect, has been commissioned to carry out the commemorative chapel which will be erected, in Rue Jean Coujon, on the site of the bazaar that was burned. The first stone will be laid on May 4, the anniversary of the catastrophe.—The Nord Railway Company has established a service of cheap trains twice a day.

Charitatively, to facilitate access to the museum.—The construction of the remaining portion of the line from Dieppe to Havre will be proceeded with shortly.—At the ancient chapel of the Chartreuse at Saint-Croix-en-Forêt, there have been found some curious paintings of the date of fourteenth century, forming four large pictures representing religious ceremonies connected with the funeral of Thiebaut de Vassallieu, who died in 1327.—M. Deulluy, the curator of the Lille Museum, has discovered in a storeroom in the Palais des Arts, a painting representing the "Repose in Egypt," and bearing the signature of Correggio.—A new bathing establishment on a very large scale is to be built at Vichy.—The Municipal Council of Lyons, following the example of Paris, is about to appoint a Committee of "Vieux Lyon," to look after the ancient remains in the city and draw up an inventory of them, and secure the preservation, by drawing or photography, of a record of those which must necessarily be removed.—A monument of the Crusades is to be inaugurated at Clermont-Ferrand on June 20; M. Heil is the architect and M. Gourgouillon the sculptor. It will consist of a granite fountain surmounted by a bronze statue of Pope Urban II.—The death is announced, at the age of 47, of the sculptor Alfred Lanson, after a long illness. This talented artist carried off the Grand Prix de Rome in 1876. He was the pupil of Joutouffroy and of Aimé Millet. He was the author of a good many remarkable portrait busts, notably one of M. Felix Faure, and of various interesting works in ideal sculpture, one of which, "Salambô," is in the Luxembourg, and another, "Judith and Holofernes," is at the Tuileries. We may mention also among his works the figure of Cardinal Richelieu at the Sorbonne, and a "Leda" in marble, and a "Jeanne d'Arc" in bronze, exhibited in the Champs Elysées Salon a few years ago. The death is announced also of M. Paul Vibert, architect, of Paris, at the age of sixty-eight, and that of Jacques Pilliard, a painter of religious subjects, whose principal works are in the museums of Bordeaux, Lyons, and Grenoble, and who died at Vienne at the age of eighty-seven.

MISCELLANEOUS.

THE SANITARY INSTITUTE.—At an examination in practical sanitary science, held in Birmingham on April 1 and 2, four candidates presented themselves. The following two candidates were granted certificates in practical sanitary science:—Woods, W. H., Belper; Fleming, R. P., Dundee, N.B. At an examination for Inspectors of Nuisances, held in Birmingham on April 1 and 2, thirty candidates presented themselves. The following ten candidates were certified, as regards their sanitary knowledge:—Bannington, B. G., Coventry; Barnes, W., Aston, Birmingham; Bird, G. J., Tamworth; Braley, F. C., Leicester; Bromley, A., Sutton Coldfield; Cooper, C. W., Liverpool; Gough, T., Everton, Liverpool; Hudson, T., Sliden, near Keighley; Merrifield, F., Sutton Coldfield; Nichol, J., Brayton, via Carlisle.—On the 6th inst., at a meeting of the Institute at the Parks Museum, Margaret-street, W. Mr. R. E. Middleton delivered a lecture, entitled "The Desirability of Making Watershed Areas and Sanitary Districts Coterminous." The lecturer said that consequent on the increase in the size of our large towns the demand for water had led to the upsetting of all previous ideas as to the sources from which supplies should be obtained. All the evidence as to water supply and water pollution showed that if areas of supply were to be safeguarded, if rivers were to be preserved from pollution, if the millowners were to obtain the utmost benefit of the power at their disposal, the population, and if the navigation, if there be any, was to be maintained, the present system of divided authority should be abandoned and a combined general policy should be substituted for it. At present every authority was in conflict with its neighbour. He was strongly in favour of dividing the country into watershed areas, for purposes of water supply and drainage, which areas could be coterminous with sanitary districts.

INSTITUTE OF CERTIFIED CARPENTERS.—The annual dinner of this Institute was held at the Bridge House Hotel on the 2nd inst.; Professor Brainerd Fletcher, President, in the chair. Among the toasts, Mr. Turville, Vice-President, proposed the "Carpenters' Company" and Mr. B. J. Jacob proposed the "Institute of Certified Carpenters," and referred to the antiquity of the craft. Mr. T. M. G. Lloyd, the Hon. Secretary, in replying, dwelt on the necessity of mutual assistance and advice for securing improvement and raising the status of the craft. Mr. J. D. Macan proposed "The Architectural Profession" (responded to by Mr. H. P. Fletcher), and Mr. W. M. Dixon proposed "The President." Songs and recitations were given between the toasts. In the course of the evening the President presented a testimonial, accompanied by a marble and bronze timepiece, subscribed for by members of the Institute, to Mr. J. Herrin, in recognition of his services as Hon. Secretary.

WORKMEN'S COMPENSATION INSURANCE.—The Guardian Fire and Life Assurance Company, which has hitherto confined its business to fire and life assurance, is now issuing accident policies of all kinds, and is prepared to consider proposals for the insurance of the entire liability of employers under the Employers' Liability Act and the new Workmen's Compensation Act without any limitation. The "Guardian" has a paid-up capital of 1,000,000, and a subscribed capital of 2,000,000, and the latter with the fire funds 526,850l., amounting in total to 2,526,850l., is the security for the policy-holders of the company generally, including accident policy-holders.

LONDON GEOLOGICAL FIELD CLASS.—Professor Seeley, F.R.S., will begin the summer course of lecture-excursions with the London Geological Field Class on Saturday, April 23. The subject of the series will be the Physical Geography and Geology of the Thames and its Tributaries. This is the thirteenth annual course. Mr. R. H. Bentley, 43, Gloucester-road, South Hornsey, N., is the Honorary Secretary to this Society, which gives a systematic course of teaching in the open country.

THE ALEXANDRA PALACE.—After having remained closed for nine years past the Alexandra Palace, Muswell Hill, was reopened yesterday week, as a place of popular resort. The original building was constructed mainly with materials from the Great Exhibition of 1862—Captain Fowke, R.E., architect—and included one of the two domes, dodecagonal at base and 160 ft. in diameter. Opened on May 24, 1873, it was destroyed by fire a fortnight afterwards. It was speedily rebuilt, and again opened on May 1, 1875. But after a while its fortunes waned: In 1887 a project was started for buying the land for the public benefit as a Jubilee Memorial, but the scheme proved abortive, and in May, 1888, the Palace was again opened by a company who had obtained a seven years' lease from the London Financial Association as owners. Then the question of securing the ground as an open space was warmly espoused by Mr. H. R. Williams, Chairman of the Hornsey Local Board, and Mr. Little, O.C., Chairman of the Middlesex County Council. At a meeting held in the Mansion House on February 9, 1893, it was stated that the Association were willing to sell for 275,000l. the entire property of 420 acres and the Palace, which had cost them 320,000l., and that the Palace, with its theatre,

concert-room, picture galleries, lecture-rooms, great hall (having a capacity for 12,000, besides an orchestra of 2,000), circus, swimming-baths, &c., covered an area of 7½ acres. It was estimated that whilst 138 acres of the land could not, by statute, be built upon, the Association could sell 280 acres for building purposes, and had already so disposed of about 40 acres. At their meeting of March 14 of that year the London County Council adopted a recommendation of their Parks Committee not to contribute 120,000l. towards the purchase money. Of late years land in the immediate neighbourhood has been sold for building purposes at prices ranging from 1,200l. to 1,500l. per acre.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the Edinburgh Architectural Association in the Royal Institution on the 6th inst.—Mr. Thomas Ross, the President in the chair—Bailie Health Committee, gave an address on "Fever Hospital Structure, with special reference to the new City Hospital at Colinton Mains." In our next issue a short resume of the address will be given.

GLASGOW INSTITUTE OF ARCHITECTS.—At the usual quarterly meeting of this Institute, the President, Mr. John Haselden, A.R.S.A., reported the result of the meetings and correspondence which had taken place with the sub-committee of the Corporation regarding the district halls competitions, and the meeting approved of the action of the representatives of the Institute in the matter. Messrs. Edward A. B. Hay and Ninian MacWhannell were elected members of the Institute. It was agreed to hold an informal dinner of the members on April 15.

LIVERPOOL ARCHITECTURAL SOCIETY.—With the object of celebrating the jubilee of this Society, the President and Council have issued invitations for a banquet to be held on the 18th inst., which, by permission of the Corporation Committee, will be held in the Walker Gallery, will be held in one of the rooms of the Spring Exhibition.

BUILDING BY-LAWS, SALFORD.—At the Salford Town Hall on the 6th inst. Mr. Edmund Pearce Burd, an inspector of the Local Government Board, held an inquiry as to the application of the Salford Corporation for the issue of a Public Health Act, 1875, under Section 203 of the Public Health Act, 1875, to repeal, alter, or amend the Local Acts in force in the borough so far as may be necessary for the purpose of enabling the Corporation to make by-laws relative to buildings and new streets under the general law. Mr. D. C. Evans, the deputy Town Clerk, represented the Corporation, and among those present were Mr. Corbett, the Borough Engineer, and Mr. H. Gilbert Whyatt, deputy Borough Engineer, and others. There was no opposition to the application. Mr. Evans stated that the regulations in regard to buildings erected in the borough were contained in Local Acts, some of whose sections required amendment.

FYLDE WORKHOUSE, KIRBY, LANCASHIRE.—At a meeting of the Fylde Board of Guardians on the 6th inst. the Clerk read a letter from Messrs. Crickmay & Sons, architects, Westminster. It will be remembered that the first premium in respect to the new workhouse plans was awarded to this firm; but Messrs. Haywood & Harrison, of Accrington, who secured the second premium, were the architects principally on the ground that they were local men. Messrs. Crickmay & Sons argue that the decision was come to not on the ground of the superiority of the plans, and they understood that an assessor had been appointed, and that he had advised the Guardians to select theirs as the most suitable design. They were greatly surprised on finding that the committee, after careful consideration, had decided that Messrs. Haywood & Harrison should be entrusted with the work. They gathered that the Guardians thought they had adopted a proper course in appointing local men. In their opinion it would have been right, if they had decided in the matter, but place that only local men should compete; but having thrown the competition open and issued their conditions, in their opinion they were bound by them. Further, they challenged the Guardians to forward the three sets of competition drawings to the Local Government Board to decide as to which set of designs most nearly complied with their stipulations and who should be appointed as architects, and by their decision they pledged themselves to be bound. Failing this, they gave the Guardians notice that with regret they felt compelled to consult their solicitors and take such steps as they might be advised in order to enforce their rights in the matter. The Chairman stated that as long as they were threatened with legal proceedings he proposed that they leave the matter alone. This course was adopted.

MUSEUM AND ART GALLERY, PLYMOUTH.—Major-General Crozier, C.B., Local Government Board Inspector, held an inquiry on the 6th inst. at the Guildhall into an application by Plymouth Corporation for sanction to borrow 22,306l. for the erection of a museum and art gallery, 550l. for street improvements, 2,500l. for public lighting, 15,800l. for the reconstruction of sewers and repairing of streets, and 1,340l. for the purchase and adaptation of premises for the purpose of a fire and police-station. The Town Clerk (Mr. J. H. Ellis) explained that the Town Council had to consider in what way they could most properly celebrate her

Majesty's long reign, and they came to the conclusion that the best way was to erect some enduring and useful memorial. Subscriptions had been raised to the amount of 1,800l., and the Council had adopted the Museums' Act. The institution would have a double object—to promote the scientific, archaeological, and antiquarian interests associated with Plymouth and the neighbourhood, and to provide a home for historical subjects illustrative of the maritime progress of England. The art gallery would be divided into sections, one to be associated with the events of the sixteenth century, another with the period between the seventeenth century and 1837, while the third would be specially identified with the reign of Queen Victoria. The site offered in Tavistock-road was part of the ancient Corporate estate, and was centrally situated, and the Council had powers to widen the streets in the immediate neighbourhood.—Mr. H. J. Snell, architect of the museum, replying to the Inspector, said there were no detailed estimates. The quantities had not been taken out yet. The Inspector: Don't you intend to take out quantities? Mr. Snell: Yes; when we get sanction for the loan. The Inspector: But we want proper estimates. When the inevitable excess arises on this building we want proper estimates to refer to. Mr. Snell said he had had a large experience as architect of the Devonport Technical Schools and other buildings, for which the Local Government Board had sanctioned loans, which he had never been asked for an inquiry before. His estimate for the Museum and Art Gallery was 22,306l.—Mr. Ellis pointed out that if the loan was sanctioned the Corporation did not propose to proceed with the whole of the work at once. It would be carried out in sections, and the first section with which it was proposed to proceed was the art gallery. In closing the meeting the Inspector reverted to his complaint at the commencement that plans of the Museum and Art Gallery, with estimates and quantities, had not been furnished to the Local Government Board, and remarked that he did not see why, when an architect designed a building, he should not make estimates and take out quantities. He always did so, but he supposed that architects considered themselves artists and not bound by the ordinary rules of business.

CAPITAL AND LABOUR.

BUILDING TRADE DISPUTE, DARLINGTON.—A meeting of the Darlington Master Builders' Association was held recently to consider the men's demands for an advance of wages and improved working rules. After a full consideration of the circumstances, the masters resolved to grant the advance of one penny per hour in the men's wages, whilst the men were accepted by the masters, the only alteration being that, instead of two, an additional apprentice will be allowed in one workshop, the third apprentice to be the son of a bricklayer.

LEEDS BUILDING TRADES.—The men in the Leeds building trades lately gave notice for an advance of wages. The masons, who were asked for 2d. per hour advance, have had their demand granted, the request for extra overtime being withdrawn. The plasterers asked for 1d. per hour advance, and the masters have offered 7½d., which has not yet been accepted. The joiners ask for 7½d. per hour advance, which is still under consideration.

THE BUILDING TRADE AT WELLINGBOROUGH.—Meetings have recently been held amongst the men engaged in the building trade at Wellingborough, with the view of endeavouring to obtain an advance of wages, which they consider they are entitled to, as the rate in that town at present is below that paid at Kettering and other places. The bricklayers, who were the first to move in the matter, asked for a penny advance from 7d. to 8d., and it is stated that the employers will be ready to yield a halfpenny. The carpenters and joiners have decided to follow the lead of the bricklayers by asking for another penny upon their present wage of 7d.

STRIKE OF HULL PAINTERS.—On the 4th inst. the Hull painters, to the number of about 200, came out on strike, owing to the refusal of the employers to concede an advance in wages. Some time ago the men, through their society, sent in an application for an advance of one halfpenny per hour upon their present rate of 7½d. This the employers refused.

STRIKE OF BRICKLAYERS, STROUD.—A strike of bricklayers in Stroud and district has taken place upon the refusal of the employers to sign a code of working rules, and, in consequence, the position of bricklayers' labourers is also affected. In all about forty bricklayers have ceased work, and their action has thrown out of employment about twenty labourers. The Labourers' Union, acting through Mr. H. Brabham, of Bristol, has intervened in the situation, and the matter has been referred to a committee of the employers with a view to the signatures to a code of rules for labourers and a wage of 4½d. per hour.

SCARBOROUGH PLUMBERS.—When the plumber of Scarborough struck last April for an advance of wages from 7½d. to 8½d. per hour work was suspended, and the condition that many operative plumbers were working in the town on April 3, 1897, as there were at the time of the strike the wages had advanced to 8½d. The time having elapsed, the

meeting of the Master Builders and Plumbers' Association, together with the Scarborough Trades Council, has been held, at which it was reported that fewer plumbers are now engaged in the town than in April of last year. It was resolved, therefore, that, in accordance with the previous resolution, the wages remain at 8d.

LEGAL.

LUMLEY AND ANOTHER V. RAINBOW DYE WORKS COMPANY, LIMITED.

In this case the plaintiffs were Messrs. Edward Lumley and F. H. Criland, the trustees under a deed of assignment of the estate of Harry Davis, of Boscombe, Bournemouth, contractor, and the defendants were the Rainbow Dye Works Co., Ltd., of Bournemouth and Weymouth.

The action was originally brought in the High Court of Justice, and the plaintiffs sought to recover the sum of 80*l.* ss. as the balance due from the defendants to Davis in respect of a contract which the latter had entered into for the erection of additions to defendants' works at Boscombe. The defendants made a counter claim of 40*l.* for penalties, and at their instance the action was referred to the arbitration of Mr. G. A. Bligh Livesey, A.R.I.B.A., of Boscombe. The hearing took place on March 9, and in that case the arbitrator's office, the plaintiffs being represented by Mr. W. D'Angibau, solicitor, of Boscombe, and the defendants by Mr. Symes, of Weymouth, and evidence was adduced by both sides. The arbitrator in his award found for the plaintiffs for the full amount claimed, and also on the counter claim, together with the costs of the proceedings, and directed that the plaintiffs shall pay the defendants' costs in connexion with the order for reference.

IMPORTANT CASE UNDER THE LONDON BUILDING ACT, 1894.

The case of Woodham v. The London County Council came before a Divisional Court of Queen's Bench, composed of Mr. Justice Day and Mr. Justice Darling, on the 6th inst., on the appeal of the plaintiff from the decision of the Tribunal of Appeal in a matter arising under the London Building Act, 1894. The appeal came before the Court in the form of a special case, which stated that the appellant, Henry Woodham, was the owner of a certain plot of land in the parish of Lewisham, adjoining the public carriage roads known as Laleham-road and Brownhill-road, and in April, 1897, he applied to the respondents in pursuance of the provisions of the London Building Act, 1894, for their sanction to the construction through the land of a new street.

The respondents refused the application. On July 1, 1897, the appellant made a fresh application to the respondents, and on August 6 following the respondents passed a resolution directing an order to be sealed refusing their sanction to the formation or laying out of the proposed street or streets, on the ground that the new street or streets would not at or from the time of formation and laying out afford direct communication between two streets formed and laid out for carriage traffic, and that the respondents might not be satisfied by the appellant that he had control over the portion of the Catford cycle track ground to be absorbed and upon which part of the new street was proposed to be formed. The appellant appealed from this decision of the respondents to the Tribunal of Appeal on the following grounds:—1. That the proposed new street would at or from the time of forming and laying out the same afford direct communication between two streets formed and laid out for carriage traffic, namely, Laleham-road and Brownhill-road. 2. That the respondents were not entitled to refuse their sanction on the ground that they had not been satisfied by the appellant that he had control over the ground upon which part of the new street was proposed to be formed. 3. That the appellant had control over the ground upon which the whole of the new street was proposed to be formed, and intended and was able to form the same in accordance with such proposal. Before the Tribunal of Appeal the appellant contended that the proposed new street or streets would at and from the time of forming and laying out the same afford communication between two streets formed and laid out for carriage traffic, namely, Laleham-road and Brownhill-road, and that such communication would be indirect, but would be sufficient to satisfy the requirements of Section 9, sub-Section (4) of the London Building Act, 1894. He also contended that each of the two straight portions of the proposed new street or streets would at and from the time of forming afford direct communication between two streets formed and laid out for carriage traffic within the meaning of the sub-section, inasmuch as each of such straight portions would, when completed, afford direct communication between the other of such straight portions and Laleham-road or Brownhill-road, as the case might be. The respondents did not rely upon the alleged failure of the appellant to satisfy them that he had control over the ground on which it was proposed to form the new street or streets, but they contended that the streets would not afford direct communication between Laleham-road and Brownhill-

road within the meaning of the sub-section, because such new street or streets would not afford communication in a straight line between those roads. They further contended that the communication was not in point of fact reasonably direct, and that neither of the straight portions of the proposed new street or streets would afford communication between two streets laid out and formed for carriage traffic, because the other of such portions was not an existing street. The Tribunal of Appeal decided that the proposed new street or streets would not afford direct communication between Laleham-road and Brownhill-road, and that the straight portions of the proposed street or streets could not be treated as straight laid out and formed for carriage traffic for the purposes of sec. 9, sub-sec. 4, because they were not existing streets, and dismissed the appeal accordingly.

Mr. R. M. Bray, Q.C., and Mr. Alexander Glen appeared for the appellant; and Mr. Horace Avery and Mr. Dalry for the respondents.

Mr. Bray in opening the case, stated that his client's land was bounded by the Laleham-road, which was a public street, and on the bottom side by the Brownhill-road, also a public street, and the new street the appellant proposed was at right angles to that. The contention of the County Council was that the street must be straight. If this contention were correct it would be illegal hereafter to build crescents or anything but perfectly straight streets. The County Council objected to both of the plans submitted to them, and said there must be no bends or angles in the street, and that the word "direct" in the section meant straight. The learned counsel said that the words "in a straight line" were not in the section, and contended that the word "direct" did not mean the interpretation put upon it by the County Council.

Mr. Avery, on behalf of the respondents, said that the contention which his learned friend had mentioned as to the words "direct communication," meaning in a straight line, was only one of the contentions put before the Tribunal of Appeal on behalf of the County Council. The second contention, which was the more material one, was that the communication to be afforded by the proposed new street or streets was not in point of fact reasonably direct. He submitted to their lordships that that was essentially a question of fact, and if they were to lay it down as a matter of law that a street in the form proposed did afford "direct communication," their lordships would have brought into Court every application for the formation of a new street, and asked to decide whether this or that street was in "direct communication" within the meaning of the Act. The section of the Act provided that the new street must afford direct communication between two streets, and the primary meaning of the word "direct" was straight, but he was quite content to adopt the contention that it meant reasonably direct as a matter of fact. Their Lordships would be asked next to say whether a street, like a flash of fork lightning, afforded "direct communication." If it were proper to have one angle in a street, why not two or twenty?

Mr. Justice Phillimore: How do you deal with the crescent point? Mr. Avery replied that the County Council might or might not object to it. The Act said that a person who wanted to form or lay out a new street must apply to the County Council for their sanction. By Section 9 a certain number of cases were enumerated which would justify the County Council in refusing their sanction. They might therefore give their sanction or they might not. There was, however, this further provision, that if they refused their sanction in any particular case, the applicant might appeal from the decision to the Tribunal of Appeal which was constituted to decide questions of fact like the present. It was a tribunal formed of practical men—surveyors and architects.

Mr. Justice Day: And men of taste? Mr. Avery: Presumably men of taste. Your Lordship means as distinct from the London County Council. Continuing, the learned counsel said that in the present case the Tribunal of Appeal came to the conclusion in fact that the formation of the proposed new street did not afford direct communication between two streets, no doubt having in their minds that if they allowed one angle they must allow two, and if two why not three or more. How could it be said that a street going in a zig-zag fashion was in "direct communication"? It was not necessary for him to argue in the present case that the word "direct" meant a mathematical straight line. In all those cases the Council in the first instance and the Tribunal of Appeal have had before them the facts of each particular case, and they could, of course, allow a certain elasticity to the expression "direct communication," according to the facts of each particular case. In the present case, upon the facts, both the Council and the Tribunal of Appeal decided that the proposed new street did not afford "direct communication." He submitted that that was essentially a question of fact, and that the Lordships should not lay down what was "direct communication," but should leave that to be determined by the Tribunal to whom Parliament had left those matters to be decided.

Mr. Bray, in reply, said that Parliament had laid it down that the County Council was not to be over-

Mr. Justice Phillimore: The County Council has to be satisfied that their objection is well founded in fact, but not well founded in law.

Mr. Bray said their Lordships were asked to say what was the meaning of the word "direct," and if it meant "straight." If the County Council were to be at liberty to refuse to sanction any new street which was not straight the Act of Parliament would have so specified.

Mr. Justice Day, in giving judgment, said he was clearly of opinion that this was a question of fact on which both the County Council and the Tribunal of Appeal had expressed an opinion, and he did not see any reason to differ from them. He expressed no other opinion about the case.

Mr. Justice Phillimore said he was of the same opinion. In many ways he would have been glad to have acceded to the argument of Mr. Bray, but he was of opinion that the Court could not interfere with the finding of the Tribunal of Appeal in the present case. It seemed to be a pure question of fact and not of law.

The appeal was accordingly dismissed with costs.

MEETINGS.

FRIDAY, APRIL 15.

Institution of Civil Engineers.—Students' visit to the Grand Junction Waterworks, Hampton. 2.30 p.m.

MONDAY, APRIL 18.

Royal Institute of British Architects.—(1) Special General Meeting (Business) to confirm the resolution passed at the Special General Meeting held on the 4th inst., suspending By-law 26; (2) Ordinary General Meeting, when Mr. A. N. Paterson will read a paper, entitled "A Study of Domestic Architecture in the Eastern States of America in the year 1896, with special reference to questions of Plan, Construction, Heating, Drainage, &c." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. G. Reid on "Sanitary Appliances." 8 p.m.
Society of Arts (Lectures).—Dr. D. Morris on "Sources of Commercial India-rubber." 1. 8 p.m.
Liverpool Architectural Society.—Jubilee Banquet.

TUESDAY, APRIL 19.

Institution of Civil Engineers.—Paper to be discussed: "The Electricity Supply of London," by Mr. A. H. Preece. 8 p.m.
Royal Institution.—Mr. T. C. Gutch on "Phases of Art, Past and Present." 1. 3 p.m.

WEDNESDAY, APRIL 20.

Surveyors' Institution (Visit to Manchester).—Meeting to be held in the Mayor's Parlour, Town Hall, at 10.45 a.m., when the following papers will be read:—(1) "Manchester, from 1847 to 1897," by Mr. John Holden; (2) "Lessons from Fire and Panic," by Mr. T. Blashill; (3) "A Consideration of some of the Present-day Difficulties met with in a Land Agent's Practice," by Mr. C. F. Hall; and (4) "Notes on the Construction of Town Buildings," by Mr. Howard Chaffell Clarke. Dinner at the Grand Hotel at 6.30 p.m.
Society of Arts.—Mr. E. O. Sachs on "Stage Mechanism." 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection of disinfecting apparatus and model steam laundry at St. John's Wharf, Fulham. 3.30 p.m.
Builders' Foremen and Clerks of Works' Institution.—Quarterly meeting of the members. 8 p.m.
Edinburgh Architectural Society.—Mr. T. Duncan Rhind on "Sculpture in Relation to Architecture." 8 p.m.
British Archaeological Association.—Mr. G. G. Irvine on "The Church and Well of St. Doulogh, Co. Dublin." 8 p.m.

THURSDAY, APRIL 21.

Surveyors' Institution (Visit to Manchester).—Concluded.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.
Society for the Encouragement of the Fine Arts.—Second Conversation, at the Galleries of the Royal Society of British Artists, Suffolk-street, Pall Mall.
Institution of Electrical Engineers.—Continuation of discussion on Mr. R. Hammond's paper on "Cost of Generation and Distribution of Electrical Energy." 8 p.m.
Society of Arts (Indian Section).—Mr. Horace Bell on "Recent Railway Policy in India." 4.30 p.m.

FRIDAY, APRIL 22.

Architectural Association.—Mr. H. B. Creswell on "The Morality and Economy of Competitions." 7.30.
Royal Institution.—Mr. W. H. M. Christie, M.A., on "The Recent Eclipse." 9 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. M. W. Henry on the "New Cut Swing-Bridge, Swansea." 8 p.m.

SATURDAY, APRIL 23.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Beddington Sewage Farm, Croydon.
Edinburgh Architectural Association.—Visit to St. Mary's Cathedral, Chapter House, Singing School, and Miss Conner's House.

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Piggot's Manor, Herts.—Messrs. Heskeith & Stokes, Architects	Single-Page Ink-Photo.
Billiard Room, Piggot's Manor.—Messrs. Heskeith & Stokes, Architects	Single-Page Ink-Photo.
Suburban Houses, Birmingham.—Messrs. Bateman & Bateman, Architects	Double-Page Ink-Photo.

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English Renaissance Architecture.—II.

THE two most powerful and original among the "personal designers," as we have ventured to class them, of the later English Renaissance were unquestionably the two principal among those who immediately followed Wren—viz.: Vanbrugh and Hawksmoor, and perhaps partly because they were more directly under the inspiring influence of Wren's genius, they have been in fact the pupil of the architect of St. Paul's. Vanbrugh is indeed very different from Wren, and in regard to the element of taste and perception in design very much his inferior; yet one may well conclude that his obvious ambition to the splendid and remarkable things were directly born of the influence of Wren and the emulation which the works of the latter excited. There is no English architect of the Renaissance concerning whom there has been so much difference of opinion. A great deal of his work was ridiculed during his own lifetime; and not without reason. He seems to have been possessed by a kind of "megalomania," and having begun as an amateur, and even no very careful study to architectural plan, structure, and detail, he had acquired the judgment in regard to questions of proportion and taste, or the power of general grasp of a design as a whole, which was especially necessary in order to control his vaulting ambition. A façade of Blenheim is a *mélange* of details which are out of proportion, which have no proper subordination to a leading aim; the architect attempts to compel admiration by sheer bigness and boldness. Look at the ponderous and useless attention, for instance, over the rusticated blocks of buildings at the extreme angles of the central mass, the palace itself; an erection twenty feet high, and with angle brackets of fifteen feet more, for mere architectural bravado and to add to what may be called the scenic effect. And in a sense it must be admitted that his admiration is compelled; one may

find all kinds of faults of taste in the façade, but it is at all events impossible to despise it; it is the work of a giant, though a rather "robustious" one, as giants, both in art and in fairy tales, are wont to be. The plan of the whole, impracticable as it is in many ways, is grandiose to a degree. The portico of Eastbury House, again, as figured in "Vitruvius Britannicus," with its immense rusticated columns out of scale and proportion, is the design of a man who is determined, whatever else he may fail in, at least to arrest your attention and impress you. And if this is not the best quality in architecture, it is better at least than the graceful feebleness and tameness of some of Vanbrugh's successors. Vanbrugh was perhaps at his best, however, when circumstances restricted him somewhat in regard to the scale of his building, and he was compelled to exhibit his passion for large and massive effect in a more concentrated manner. For this reason we have always thought that Seaton Delaval—now we believe, either in ruin or going to ruin—was his best work. He there contrived to impress on a house not of the largest scale an expression of grandeur and dignity which has seldom been surpassed in English mansion architecture.* His manner of giving dignity and mass to a small and plain street front was also shown in the design which he made for the old opera house in the Haymarket in which many of Handel's operas were produced, a drawing of which is in the Crace collection of the British Museum.† It is noteworthy that Vanbrugh's genius excited the high admiration of Reynolds, who admired the skill in composition with which, "to support the principal object, he produced his second and third groups or masses." But this, as Mr. Blomfield truly remarks, is looking at architecture rather too much from a painter's point of view, as a subject for free composition unhampered by practical requirements; and that was just Vanbrugh's own position: he regarded the plan as subordinate to the effect, and in all probability designed his "masses" first and made the plan fit them afterwards. Yet we do not think any discreet critic will dis-

sent from the sentence with which Mr. Blomfield dismisses him, to the effect that "his passionate appreciation of the abstract qualities of architecture gives him a place by himself among the architects of a country in which the very existence of those qualities has almost ceased to be recognised." These be very bitter words, but it is to be feared they are too true.

Mr. Blomfield's view of Hawksmoor, which we think critically correct and very well put, is that his style was the product of the mixed influence of Wren and Vanbrugh. He was "a well-trained architect," consequently with much more scholastic acquisition than Vanbrugh, who "was incessantly trying to translate Vanbrugh into terms of Wren;" and in this respect he draws attention to the curious contrast between the lower and upper portions of the façade of St. Mary Woolnoth, the lower portion obviously designed under the influence of Vanbrugh, the crowning turrets showing a reminiscence of Wren. It is an additional testimony to the influence exercised by Vanbrugh's masterful spirit in architecture, that he should thus have had power to influence Wren's own attached and devoted pupil. But to our thinking Hawksmoor had more of the originality and shaping faculty of Wren than any other of that master's successors. If we compare two such towers as that of Spitalfields Church and St. George's, Bloomsbury, both so individual in character, and so entirely different, we recognise there the same kind of inventive faculty which enabled Wren to give such extraordinary variety to a number of towers, all formed, as one may say, out of the same general repertoire of architectural materials. We quite agree with Mr. Blomfield that Spitalfields, next to St. Bride's and St. Mary-le-Bow, is the finest Renaissance steeple in London, and one showing great boldness and originality of design.

Whatever faults may be found with the work of Vanbrugh and Hawksmoor, in regard to refinement of taste in proportion and detail, they may be said to close the short but striking chapter in English Renaissance architecture in which the materials of Classic architecture were made the basis for the evolution of really original and striking designs, architectural creations not depending absolutely upon any precedent; the chapter almost entirely occupied by the work

* A drawing of the house, with a plan, by Mr. J. W. Twist, was published in the *Builder* of April 22, 1893.

† A reproduction of this drawing was published as a frontispiece to a collection of essays on music, "Thoughts on Music and Musicians," by the Editor of this Journal.

of Wren and these two brilliant satellites. Flitcroft's comparatively weak but still original steeple of St. Giles-in-the-Fields is perhaps the only other Renaissance steeple in London which somewhat reminds us of the inventive power of Wren. Gibbs's steeples of St. Martin-in-the-Fields* and St. Mary-le-Strand, more graceful works in a sense than any of Hawksmoor's, are in comparison academical—mere putting together of features that could be got out of books, except perhaps the spire portion of the former, which however is rather weak. As Mr. Blomfield says, in entering on the consideration of the period immediately following Hawksmoor:—

"Architecture had already become an elegant accomplishment of the upper classes. To the free masculine intelligence of Wren had succeeded mere scholarship, rapidly degenerating into pedantry. When a correct use of the orders, according to the recognised canons, was the test of architecture, and the question of cost was seldom raised, the amateur very soon stepped to the front, and began to furnish designs of his own, or, at any rate, to give instructions to draughtsmen who were content to leave to the amateur the credit of the design. A little later we shall find Lord Burlington represented as one of the first architects of his time. Architects probably found it inconvenient to question the claims of their distinguished patrons, but occasionally the 'ghost' lost his temper, and amusing revelations followed."

In reference to Lord Burlington we may observe, though we have not space to go into the matter, that Mr. Blomfield gives very good reasons for the opinion, which is on general grounds the most probable one, that Lord Burlington was merely an aristocratic patron of architecture, who made suggestions which other people carried out, and that all he had to do with Burlington House, as with other designs called his, consisted in the function of paying the bill. Aldrich was an amateur of another stamp, whose learning in music, which was one of his pursuits, is unquestionable and is attested by sundry clever compositions, and therefore we may presume that when he professed to design architecture he also did his own work; though we think that the tower of All Saints, Oxford, which Mr. Blomfield approves and gives a sketch of, is not more connected and coherent in its various stages, though less imitative, than that of St. Pancras in London. In short, it is very likely Aldrich's own design, in view of the very fact that it is somewhat amateurish.

The course of our Renaissance architecture from the time when it took its purely Academical turn is to a great extent, at least as far as the works of its leading architects are concerned, exemplified and illustrated in the monumental folio publications which now began to play an important part in architectural literature, and which, while they had their origin in the fact that architecture had now become a thing of rules and precedents rather than of inventive genius, had their own influence in further promoting the habit of looking at and studying buildings on paper rather than in the round. Of these the most comprehensive of course is the

* We observe that both Mr. Blomfield and Mr. Wheatley (in his valuable book "London Past and Present") give the name of this church as "St. Martin-in-the-Fields." This is surely a popular error. It is the saint who is "in the fields," not the building. Part of St. Martin's sanctity consisted in his living for a long time an ascetic life on a desert island. There are other churches dedicated to "St. Martin-in-the-Fields" in this country; and if we remember right, we meet with the dedication to "Saint Martin-aux-Champs" in France.



Fig. 1.—Town Hall, Wallingford.

"Vitruvius Britannicus," edited by Campbell, as this was a collection of designs by various architects from Inigo Jones downwards, while most of the other prominent folios were "one-man exhibitions," each brought out by one architect with a single eye to his own glory, at once a monument of his own achievements in the past and a suggestion for his employment in the future. There is something at once impressive and pathetic about these great tomes, with their sturdy bindings, large margins, and boldly-printed title-pages in colossal lettering, and the hard mechanical line-shaded elevations which they show us, where so much manual labour is expended on so little detail that is of any interest or individuality. It is in the plans rather than in the elevations that we must look for any variety or suggestiveness of ideas. Campbell, who made "Vitruvius Britannicus" serve his own purpose by inserting in it a rather large proportion of his own designs, under colour of giving a general illustration of the architecture of his age and country, propounds on one plate "a new design of my own invention," but one has to look hard for the novelty, which seems to consist only in a slightly different manner of placing and proportioning the inevitable order of the portico. The "Prospect of Montague House to the street" shows us only the prospect of a huge blind wall covered with panels (where the lofty iron railing of the British Museum now stands). Archer is credited with an original and rather effective plan for a pavilion for the Duke of Kent, based on a double triangle, with alternate square and semicircular projecting bays. Wilberry House, belonging to Mr. Benson, was "invented and built by himself in the style of Inigo Jones," but his

portico is too weak and small for the Wilberry House, with its colonnades in convex (not the usual concave) quadrants connecting the main house with the wings, is in some respects a fine piece of architecture. Braman Park, with its sloping drives up to the door, and the open column screen on each side connecting the house with the wings and giving access to the back, is some originality of arrangement. Houghton and Wanstead, both by Campbell himself, are both good and sensible designs in their way: Wanstead, with its central portico raised centre, and lower wings, all on the same symmetrical lines and of the "box of brick" type of architecture, has nevertheless dignity and good proportion; and Houghton is a design of the same class, which however looks much more pleasing and picturesque in the photograph published in Mr. Blomfield's book, showing the side without the portico, and with Ripley's domes at the angles. So with many of the houses lined out in elevation in this hard and uninviting manner; they produce a better impression in actual existence than they do in Campbell's folio pages. In fact, nothing together in stone by the hands of artists with human forces and feelings could have the life quite so much squeezed out of it as it is in these plates of "dried specimens."

Ware's "Complete Body of Architecture" is an illustrative than a theoretical book, a formidable résumé of the architectural ideas of the day (1756), not without amusing passages. In regard to the employment of the orders he is particular in recommending that if more than one order is employed, the heavier and more solid should be at the lower portion of the design, though he adds in a cautionary spirit, "if



Fig. 2.—Town Hall, Abingdon.

be very magnificent buildings indeed which there are several series of columns." remarks on arches are worth quoting:—"y arches the student should understand segments of a circle. The Gothic is disclaimed, and is no form which is capable of so much strength as the plain sweep of a true circle: the arch we have treated of elsewhere, and they have never be admitted for bridges." [The reason is, if there were any in his mind, he does not like to give.] "In the first construction of building the Gothic or sharp arch was not unnatural, but improved who took off the point."

his design intended for Westminster Palace is, however, rather a fine one. Paine's "Plans, elevations, &c., of gentlemen's houses" is one of the illustrative folios; Mr. Blomfield observes, dates it 1783, but the copy in the Institute Library has the date 1767. It is a grandiose character about some of the designs—Sandbeck for instance; and it is a very grand conception of plan for a mansion on the largest scale. Richmond Palace, of which Paine was the architect, is in an elevation in the book; here again it is curious to note how far inferior is the impression conveyed by the drawing to that of the actual erection. Gibbs's "Book of Architecture" though considerably earlier than Paine's

(1728), has a more modern air both in the style of the designs and in the make-up of the drawings. His plans and elevations for houses may mostly be described as eminently sensible, and a design for a circular church (not carried out) has a good deal of merit and even of originality. Then we come to what may be called the posthumous volumes of the "Vitruvius Britannicus," Gandon's continuation of Campbell's work, and like that a collection of designs by various architects. One or two of Chambers's mansions shown here have striking or unusual points in plan and treatment, Dudingstone for instance, with the main block of the house not in the centre as usual, but in front on the left of the whole group, the inferior block and the stables ranging away behind and to the right and connected by corridors with the house. Vardy's Spencer House appears here, much inferior in drawing to its actual impression, and Dance's poor design for the Mansion House, which, oddly enough, impresses one more favourably in the drawing than in the actual building. Woolfe's plan of Gopsal shows one good point; he gets the favourite effect of the connexion of the wings to the house by a concave quadrant, by the use of a pilastered wall only, with no building

behind it; the architectural effect in front is the same, and the difficulty of arranging rectangular rooms in the rear of the quadrant is avoided. There is something suggestive in Wood's long narrow plan of Buckland, with its possibilities of vista; in the plans of Witham by Adam a great deal of internal interest is provided for by the clever and unexpected arrangement of the rooms; and Haythorpe (the architect's name is not given) shows a fine plan, and a fine effect is gained in the elevation by the decoration of the centre block with an order the whole height of the block and very richly treated, contrasted with the exceedingly plain design of the wings.

There are two features in the treatment of great mansions which constantly re-appear in the plans and designs illustrated in these monumental folios, both of which are architecturally fine, though both would be regarded in the present day as unpractical if not impracticable. One is the manner of placing the offices and inferior apartments in separate "wings" connected with the mansion by curved colonnades or quadrants. Of the architectural effectiveness of this there can be no question; but as a matter of plan it is a system eminently inconvenient for the working and traffic of a great house. The other is the system of treating the lower story of the house architecturally as a basement, rather low in proportion and massively designed, and providing access to the *piano nobile* by a great double flight (generally) of external steps. For dignity and grandeur of effect this is the treatment *par excellence* for a great mansion on the largest scale. It is sacrificed in these luxurious days because people will not, it is supposed, consent to have to go up a flight of external steps to reach the house. We put it as a question worth considering, whether the slight inconvenience, which in fact only exists in bad weather, would not be more than compensated for by the stateliness of the effect. To our thinking the loss of these external flights of steps is the greatest loss which mansion architecture has sustained in modern times.

In giving a few more illustrations, from the second volume of Mr. Blomfield's book, we have preferred to select those from the interesting chapters on "The Trades," the state of masonry, carpentry, ironwork, &c. during the later period of the English Renaissance. These chapters are full of interest, and the illustrations lead us into the region in which we come on the more naive use made by country workers of the materials of Renaissance architecture. Grandeur is not here, but picturesque interest is more to be looked for than in the class of buildings connected with the names of the eminent architects; and it would perhaps be difficult to find buildings of this scale more interesting in themselves, or more characteristically English, than the town halls of Wallingford and Abingdon (figs. 1 and 2). Among the examples of ironwork in the book there is nothing that pleases us so much as the simple but truly artistic tomb railing from Currey Rivell in Somersetshire (fig. 3). The tombstone at Dorchester (fig. 4) Mr. Blomfield gives as an illustration of "that traditional skill which enabled the mason of the seventeenth century to carve his stones as well as to lay them . . . while Artari and Bagutti were modelling conventionalities in stucco for Gibbs, the stone-mason

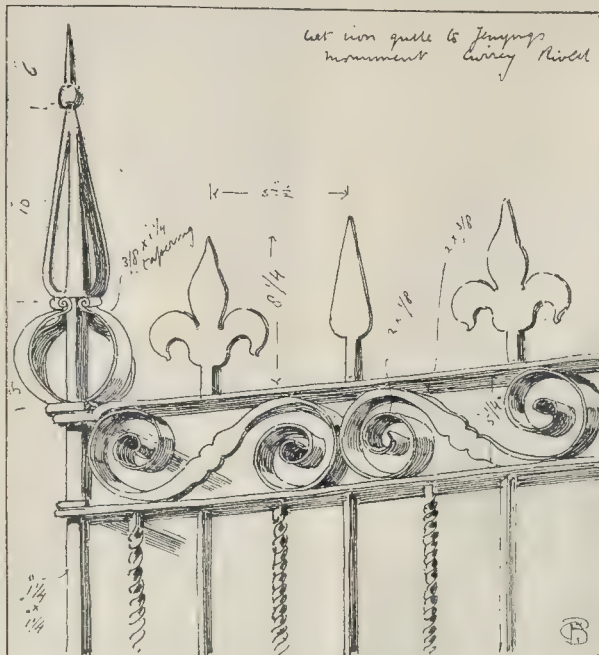


Fig. 3.—Grille, Curry Rivell.

at Dorchester was cutting on his tombstones the mallows and forget-me-nots [of the meadows round his home." Perhaps the author's enthusiasm has led him to regard that as a typical example which is rather a happy exception. A considerable amount of wandering in country churchyards has not led us to the conclusion that there is much of inspired or unconventional ornament to be found in them. But this example is at all events a very charming one, and we may thank the author for having unearthed it.

And now, in this present Renaissance of the Renaissance which we are in the midst of, what further are we to hope for in the way of development? One thing seems certain; we shall not get much further by merely studying and reproducing, as too many young architects are doing, the characteristic features and details of the English Renaissance; the treatment of the orders, the method of employing rustication, the broken pediments, &c. We shall get tired of all these things presently, and there is only an *impasse* that way. There are perhaps two lessons that may be capable of new application. Inigo Jones taught his contemporaries, and may still teach us, the value of the careful study of proportion of mass and refinement of detail; and some of the later Renaissance architects have shown us examples of great dignity of treatment in the design of large mansions and other buildings, but in a cold and academical manner. The picturesqueness of the earlier Renaissance is wanting in them. We seem to be rather taken with the picturesqueness of the earlier work at present, and are somewhat disposed to underrate the value of symmetry and dignity in architectural design. Can we not combine the two qualities in our new Renaissance, and add the picturesqueness of detail of the

earlier Renaissance to the stateliness of the later Renaissance. That seems to be a task still left to be accomplished, and the endeavour to carry it out may lead us to something a great deal better and more truly architectural in spirit than the mere reproduction of closely studied details of seventeenth or eighteenth century architecture.



Fig. 4.—Tombstone, Dorchester.

NOTES.

A FEW days since, Parliament had under consideration an Instruction to the Select Committee on the London Building Act (1894), moved by Mr. Banbury, to the effect "that it be an Instruction to the Committee to take into consideration whether the offices and buildings of the Stock Exchange should

be exempted from the operations of Parts VI. and VII. of the principal Act," which regulates the construction of buildings and of temporary buildings and wooden structures. Mr. Pickersgill, in opposing the motion, said truly that all exemptions from the operation of the Act should be most jealously guarded and moved, as a compromise, that the Instruction should be amended by the substitution of the words, "Parts of VI. and VII.," an amendment which was lost by 64 to 46, and the Instruction agreed to. We do not quite see what sufficient ground the Stock Exchange can have for claiming to be put in the "exempt" list; it can hardly be said to be a national institution in the same sense, for instance, as the Bank of England. But at the present the Instruction is only that it claims should be considered, and there is no need to object to that. We should expect, however, to find that the enquiry of the Select Committee will result in their declining to recommend the alteration.

THE proposal of the Dean of the Chapter of Canterbury to place a gilt figure of St. Michael on the roof of Canterbury Cathedral, which is being talked about, is a foolish one which we hope will not be carried out. It does not follow that, if there once was a Medieval figure to give the popular name to the "Angel Tower," there is anything to be gained by placing a modern one there, which cannot be in harmony with Medieval work. It is not the case of an empty niche which seems to proclaim the want of a statue; there is no sense of an omission to be remedied, and therefore no necessity for the intrusion of a modern work of the kind. It is true that the French recently done exactly the same thing at Mont St. Michel, and employed one of the first of their contemporary sculptors to execute the work (an example which would not be likely to be followed at Canterbury), but the French hardly furnish the best precedents in regard to the modern treatment of medieval buildings.

THE collection at the Château of Chantilly, which, as we have already noted, is to be now known as the "Musée Condé," was opened to the public on Sunday last, when a crowd of visitors evinced the greatest admiration for the splendid legacy left by the Duc d'Aumale to the French nation. Among the paintings, the Italian school is represented by works of Raphael, Lippi, Botticelli, and Fra Angelico; the Flemish school by Memling and Van Dyck; the French by Poussin, Largillière, and Watteau, among the ancients, and Meissonnier and Corot among the moderns; and among English works is a splendid portrait of "Philippe Egalité" by Reynolds. The collection of enamels of various periods, and the splendid series of drawings by great artists, from Giotto and Pisanello down to Charlet and Delacroix, also attracted great attention. One of the most curious features of the museum is the collection of forty miniatures by Jehan Fouquet for the *livre d'heures* of "Maitre Etienne Chevalier." Added to all these are the profusion of splendid tapestries, furniture, books, and armour; the whole together forming one of the most remarkable artistic collections in the world. We may add that

the suggestion of M. Gérôme, the town council of Chantilly have determined to erect an equestrian statue of the Duc d'Aumale on a small *place* which separates the Chantilly stables from the high road. M. Gérôme is going to undertake the model for the group.

THE most important paper in the new number of the *Journal of the Hellenic Society* (XVII., II.) is that by Mr. Arthur Evans on "Further Discoveries of Cretan and Aegean Script." In the course of this paper Mr. Evans publishes and discusses, though he has not yet attempted to interpret, the "inscribed libation table from the Diktean Cave," which is at present the only instance of consecutive inscription in the pre-Phoenician script. The libation table in question is a dark steatite fragment of a low table, exhibiting cup-shaped hollows with raised sides similar to those of the stone libation vessels of Ancient Egypt. Its form when complete had been oblong, with four short sides and a central stem; it had originally possessed three cups, the central one rather larger than the other two. The inscription is in clearly-cut characters along the outer margin of the table. The characters belong to the "linear type" of the pre-Phoenician script of Crete. Eight letters are partially preserved. Mr. Evans, by the help of comparison with Egyptian monuments, dates the libation table as about 2,000 B.C. The inscription is thus not only separated, *longo intervallo*, from the most ancient examples of cuneiform writing, but it distances by at least a thousand years the earliest specimens of the alphabetic alphabet, as seen on the Baalbanon bowls and the Moabite stone,

THE French Government has approved the designs for the façades of a portion of the wings which are to be erected on the ramp de Mars and the Esplanade des Invalides for the 1900 Exhibition at Paris.

Buildings for Tissues and Clothing, that for Education, and that for the "Procédés Chimiques, Mécaniques, et des Matières Premières," (we give the original words as we are quite clear as to the rendering of their meaning in English), which are to be on the ramp de Mars, are to be entrusted to two architects, M. Blavette and M. Sortais. MM. Bony de Saint-Vincent, Larche & Nachon, and Pradelle, are to be joint architects for the palaces on the Esplanade des Invalides.

SIGNOR MASCONI has recently made some interesting experiments on the Solent on signalling without connecting wires. Two stations are fitted up, one at Alum Bay, on the Isle of Wight, and the other at Bournemouth, between these places, which are fourteen and a half miles apart, regular communication has been maintained for the last few months. The instruments at both stations consist of the usual induction coil, coherer, and Morse printer. A distinctive signal is tall mast 120 ft. high at each station, the pole of the coherer being connected to the top of the mast, and the other being put to ground. Of course, the rate at which messages can be sent in this way is very slow compared with ordinary telegraphy, but there are many cases in which this method is alone practicable. For example, signalling between ships at sea in all states of the weather, or

between ships and the shore could be done by these Hertzian waves. There is not much privacy about this system of signalling, as any electrician in the neighbourhood could read the message if he had a coherer and a Morse printer, but this difficulty might be got over with the help of a code. A more serious difficulty in war time would be that if several ships were signalling at once, all the messages would get hopelessly mixed up. Professor Lodge recently showed to the Physical Society a system which he has invented to partially overcome this difficulty. He also pointed out that it is better instead of using a coherer—that is, a tube containing a mass of metal filings—to use simply a needle pressing against a flat spring. This forms the most sensitive of all coherers, and in addition it possesses the great merit of not needing to be tapped mechanically to bring it back to its sensitive state.

The instructions to architects for this competition, which is promoted by the Corporation of Salford, have been forwarded to us. The competition is for chapels, offices, lodges &c. The instructions include one most objectionable provision, viz.: that architects are to state, in their report accompanying the drawings, the percentage on the estimate which they expect as their professional fee; in other words, the architectural commission is put up to the lowest bidder. No architect of any standing, the Corporation may be assured, will have anything to do with a competition on those terms. Furthermore, we observe that the plans of chapels, offices, and lodges are to be to a scale of $\frac{1}{4}$ in. to the foot—a larger scale than is usual even for working drawings, and that, in consideration of the payment of premiums of 50*l.*, 30*l.*, and 20*l.*, the Corporation propose to retain three of the designs as their property. If they were to select designs there would be less objection to this last provision; but what they are asking for amount to working drawings, for which such sums as are offered are no remuneration.

We are informed that the new offices for this bank will be erected after the designs of Mr. A. C. Blomfield, of the firm of Sir A. W. Blomfield & Sons. The business of the firm was amalgamated with that of Messrs. Barclay, Bevan, & Co. two years ago, and now forms the Fleet-street branch of Barclay & Co., Limited. About the middle of the seventeenth century the Lombard-street and West Cheap goldsmiths and "keepers of running cashes" began to move to Fleet-street and further westwards; in 1650 Henry Pinckney traded as a goldsmith at the sign of the "Three Squirrels" in Fleet-street, opposite St. Dunstan's Church. Some years afterwards, James Hoare, of the "Golden Bottle," moved to Fleet-street from Cheap-side. After the Great Fire, Pinckney rebuilt the premises, his landlord, Thomas Thorold, adding the site of the adjoining house, the "Holy Lamb." Pinckney died in 1678; his brother William, a goldsmith at the "Golden Dragon," next door, succeeded to the business. It appears that the existing two houses cover the sites also of Hercules Pillars (or "Gun-in-Hand") alley, the "Crown," the "Three Daggers," and the "Wheatheaf." In course of time Sir

Francis Gosling, alderman of Farringdon Without succeeded (1742) John Simpson as partner of Thomas Ward, who died in 1743. That same year the firm's name was changed to Gosling and Bennett; in 1754 Robert, brother of Sir Francis, became a partner.



No. 19, Fleet-street, about to be rebuilt.

Sir Francis died on November 29, 1768, the firm being then styled Gosling, Gosling, and Clive; in 1795 it was joined by Benjamin Sharpe, when the long familiar style was adopted. The books, we learn, are preserved from 1715; the roll of customers bears many famous names, including those of Warren Hastings and Lord Clive; Pope and Samuel Richardson; Rivington, Longman, the Tonsons, Lintots, and Woodfalls; Bishops Warburton and Percy of Dromore; Lords Ellenborough, Camden, Campbell, and Denman; and the *Times* and *Morning Advertiser*. On the pulling down of Lud Gate, Sir Francis Gosling obtained the statue of Queen Elizabeth for the church of St. Dunstan-in-the-West (rebuilt, 1831-3, by J. Shaw). A model of the "Three Squirrels" was in Mr. G. Birch's Old London street at the Health Exhibition 1884. We understand that the original painted sign of the house, recovered about forty years ago, together with the watchman's-box standing outside, within the railings, will be carefully preserved.

Highgate Grammar School.

Exhibition at
the Burlington
Club.

THE Burlington Fine Arts Club has got together a collection of works of the Milanese and allied Lombard Schools, which is of great historical interest, and is accompanied by a catalogue containing a great deal of valuable information in regard to the painters represented. From the purely artistic point of view, it must be confessed, the exhibition is not very attractive; it is a collection of mostly rather dull and conventional representations of sacred subjects, unattractive either in colour or design; valuable as representing the work of a school, but not interesting in the abstract. We feel sceptical as to so-called Solario, No. 21, which is described in the catalogue as "formerly attributed to Perugino, and first recognised as a genuine Solario by the present owner." Owners of pictures have rather too much interest in recognitions of this kind, and if we compare it with No. 22, an admitted Solario and a very fine work of its class, it is difficult to believe that these two are by the same hand. One of the most interesting works there, one of the few which has real character, is that by Buttinone, No. 2, "Virgin, Child and Angels." There are a good many interesting examples of Luini, and a good many paintings headed "attributed to Leonardo da Vinci," but in nearly all cases the attribution is watered away in the notes, and the better for Leonardo's reputation. Still, it is an exhibition for all who are interested in the history of painting to visit.

The
New English
Art Club.

THE exhibitions of this Club become more and more a melancholy spectacle of perversity and of the degradation of the art of painting. Among the few exceptional works from which one can derive some pleasure, and which seem out of place among their surroundings, are a portrait of a lady (87) by Mr. Furze, the small marble bas-reliefs of cattle and a shepherdess, by Mr. Havard Thomas, a pretty sketch portrait of a girl by Mr. W. W. Russell (70), and some large and small landscape sketches—for they are only sketches—by various contributors; "The River Dudden" (17) by Mr. Oliver Hall; "Moonlight on the Seine" (52) by Mr. Douglas Robinson; "The East Wind in Summer" (67) by Mr. Francis Bate (we cannot see any evidence of wind in the picture); "Spring" (75) by Mr. A. Tomson; a landscape with no title (120) by Mr. J. Charles, and two large and coarse but vigorous sketches by Miss Alice Fanner (134, 136) of Thames scenes in windy weather. The remainder of the collection consists mainly of figures and portraits painted in dirt rather than in colour, the most prominent and central one being a naked woman asleep on a sofa in a very ungainly attitude—a painting absolutely devoid of any charm either of line or colour; a number of landscape "splashes" rather than pictures, some of them looking rather like pieces of carpet, and a representation of St. Paul's Cathedral (85), in which the proportion of the dome and towers is all wrong, the latter being represented by formless brush-dabs which do not even suggest the silhouette of the beautiful cupolas, much less their detail. This work, we gather from the private-view "asides," is considered a great success by the habitués of this gallery of cranks, who appear to have no more knowledge of the real

architectural forms of St. Paul's than the artist who has pretended to represent them.

"SOME English Cathedrals and their Towns" is the title of a collection of watercolours by Mr. and Mrs. Harry Hine, on view at Messrs. Dowdeswell's Gallery, which is disappointing after so fascinating a title. As landscapes many of these have high merit; the best of all perhaps is the small one called "Durham—twilight" (68), a fine little bit both of colour and effect, and there are others which are very interesting as landscape compositions. But unfortunately the buildings, where they form prominent and important objects in the composition, are treated in such a weak and inadequate manner that to an architect the exhibition can have little of the special interest which the subjects seemed to promise.

At the Fine Art Society's Gallery a collection of drawings by M. Caran d'Ache, the private view of which takes place to-day (Saturday), enables the London public to make a more general acquaintance with a caricaturist whose work recalls the savage days of Rowlandson and Gillray, except that, being more palpable and exaggerated caricature, amounting often to extravaganzas, it gives perhaps a less cruel impression. A whole room full of this kind of thing is rather too much, but we recognise the artist's remarkable power of line drawing, and the biting satire contained in many of the designs. Among the best, intellectually, are the series of sketches for placing Napoleon on the stage and for "Napoleon in Private" (Nos. 8 to 12), and the splendid one of M. Faure as the Gallic cock, escorted by the Russian eagle through the Peterhof Gallery, in face of the bust of Louis XIV. A few powerful charcoal sketches of military subjects exhibit another side of the artist's talents.

THE SCIENTIFIC RATIONALE OF GLASS PAINTING.

1. The Glass.

GLASS is a mixture of several silicates with some free silica. Although in many respects it may be looked upon as a salt in which the silica forms the acid element, yet in actual practice the proportions of acid and base are not according to their combining weights. And although it is true that in general the more nearly the proportion of silica approaches the amount necessary to form definite compounds with the basic ingredients, the better and more stable is the glass, yet the proportions of the various constituents so modify the qualities of the product, fusibility, &c., that in practice proportions are taken that will give to the resulting glass the particular properties desired.

Glass, as we ordinarily know it, is a compound of silica with at least two metallic oxides, one oxide belonging to the group known as the alkalis and the other belonging to the group known as the alkaline earths. The alkalis usually used are:—Soda (oxide of sodium) and potash (oxide of potassium) and the alkaline earths: lime (oxide of calcium) and oxide of lead.

Silica (oxide of silicon, a non-metal analogous in many ways to carbon) occurs in Nature as flint, quartz, rock-crystal, and in various other forms. In the form of rock-crystal it is perfectly translucent, but excessively infusible, requiring the intense heat of the oxy-hydrogen blow-pipe to fuse it. If, however, it be heated with a proportion of either soda or potash, the melting point is at once lowered, and a vitreous transparent slag is the result.

But the compound thus formed is quite unable to perform the ordinary functions required of a glass, for it is found to be soluble

in cold water. On increasing the proportion of silica the fusing point rises, and the insolubility of the resulting compound increases; but a point is soon reached—still short of producing a serviceable glass—when the further addition of silica produces opacity. The combination of silica, then, with either potash or soda does not produce a glass of any value, but it is found that the addition of a small proportion of either lime or oxide of lead has the immediate result of raising the fusing point, increasing the insolubility, and at the same time retaining the transparency of the glass.

Thus glass is really an alloy of several silicates, and varies in character with the proportion of its different ingredients. Lime exercises the greatest influence in increasing the hardness of glass, oxide of lead produces a softer but a more brilliant variety—crystal and flint glass.

In addition to the different kinds of white glass, we have coloured glass, perfectly transparent, and now attainable in almost every conceivable tint.

We have seen that ordinary white glass is a compound of silica with one or more oxides belonging to two different groups—the alkalis and the alkaline earths; if now to these materials there be added a small proportion of certain other oxides, colours are transmitted to the glass without in any way interfering with its transparency.

Thus an oxide of cobalt produces that intense blue familiar to every one in the painted windows produced just anterior to the present-day revival of stained glass. The very striking purple, too, and the vivid greens depend chiefly on the oxides of manganese and chromium respectively for their tints. The magnificent rubies produced at the present time owe their rich colour to the suboxide of copper, while the oxide of gold produces delicate rose pink.

The bottle-green colour of the various "whites" used in a stained glass window is obtained by the use of oxide of iron, and at the varied tints which our modern church windows can boast are produced by the use of various oxides or mixtures of oxides heated with the pot metal to various temperatures.

Ordinary glass is very feebly affected by water, but prolonged exposure to moist air acts on glass, especially on highly alkaline varieties, that the surface becomes clouded and obscure. This effect may be readily seen on most of the more ancient stained glass windows. The surface frequently presents an appearance of minute pin-holes, and occasionally examples may be met with where the disintegrating influence of the atmosphere has taken place to such an extent that portions of the glass may be crumbled between the fingers.

Acid.	Alkaline.	Earthy.	
		Colourless.	Coloured.
Silica. (Oxide of silicon)	Oxides of Sodium, Potassium.	Oxides of Calcium, Lead.	Oxides of Iron, Manganese, Copper, Chromium, Uranium, Cobalt, Gold.

2. Painting Colours.

The process of glass painting really consists in establishing upon the surface of the glass layers of some opaque substance in varying degrees of thickness, thereby producing variations of light and shade. The opaque medium almost invariably now used consists of oxide of iron mixed with some soft variety of glass, which, melting at a heat which is only sufficient to raise the glass on which it has been painted to redness, binds the opaque oxide firmly to the surface of the glass.

Two oxides of iron are in general use; the red sesquioxide (occurring in nature as a earthy form of red hematite), which is chiefly employed for outlining, and the brown hydrate sesquioxide (brown hematite or limonite), used for the subsequent painting.

Of course, almost any opaque oxide might be used to serve the same purpose, and oxide of manganese, cobalt, copper, and iridium have been employed at various times; the chief advantage of the iron oxides being their rich colour.

The flux or glass with which they are in

tely mixed consists generally of oxide of lead, oxide of potassium, and silica.*

3. Stains and Enamels.

The yellow stain is almost the only colour that is now applied to painted glass in this country. Enamels, it is true, are occasionally used for small heraldic work, but they are usually opaque and ineffective, and are regarded as illegitimate by most glass-painters. Many painters still observe the custom of shading hair with a mat tint of black or brown, but in this case it is not an enamel that is used, but a coating of some painting colour that by the thinness of its mat is semi-transparent, and thus transmits the colour of the oxide employed in its manufacture.

The yellow stain, which is perfectly transparent, and may be varied from a rich orange to a pale lemon colour, depends for its colouring action upon salts of either silver or antimony. Antimony is now almost universally discarded in favour of silver, which if properly used, may be made to produce any gradation of tone.

The silver salt employed is the chloride, and the clearness and delicacy of colour of the stain depends on the purity and cleanliness of the silver salt, great care should be exercised in its preparation. It is best prepared in the following manner:—

An ounce of fine silver is placed in a basin, better still, a large evaporating dish—and pour a quart of a pound of strong nitric acid poured over it. The basin is then placed in a warm situation (the hob of an ordinary fire-place is very convenient, and the acid fumes will then go up the chimney), and a little more acid added from time to time until nearly the whole of the silver is dissolved. It is next necessary to make a saturated solution of common salt; this is prepared by simply adding as much salt to a jug of hot water as the water will dissolve. When the superfluous salt has settled down, and a clear solution has been obtained, the solution of silver in nitric acid (nitrate of silver) must be transferred to a large basin and diluted with several times its own bulk of hot water. The clear salt solution is then slowly poured in. A copious white precipitate immediately begins to fall; this is chloride of silver, the silver salt that is employed in staining glass. After the whole has been stirred carefully with a strip of glass the precipitate is allowed to settle to the bottom of the vessel, and a little more salt solution added until no further precipitate falls. When this point has been reached the chloride is allowed to settle as before, and the supernatant liquor poured off; the basin is then filled with hot water, the precipitate thoroughly stirred up, allowed to settle, and the water poured off. This is for the purpose of washing the silver chloride, and the operation is repeated until every trace of acid and salt has been removed from it. The precipitate is then transferred to a smaller basin, covered over with a sheet of paper and placed in a warm situation to dry. When dry it is best kept in a glass bottle, away from the light.

The silver chloride is usually mixed with ordinary yellow lake (two to three parts by weight of the lake to one of the chloride, according to the strength required), but the lake is, of course, no colourative action, but merely serves as a medium to convey the silver to the surface of the glass.

Enamels are simply varieties of soft glasses coloured with metallic oxides, as already described. The coloured glass is ground to powder, mixed with some medium and applied to the glass; but the particles seldom properly fuse together, consequently a dirty opaque appearance is the rule, and purity and transparency of colour very much the exception.

4. Firing.

The operation of firing the painted glass in this is an exceedingly important one, since all the skill and care of the painter may be easily undone or disfigured by a careless or unskilful fireman.

It has been stated that it is necessary to heat the glass to just that degree of heat at which the flux shall melt and bind the opaque oxide to the softened surface of the glass. If the glass is heated short of this, a raw appearance is observable, and the oxide, unprotected by its using of flux, will, in a comparatively short time, flake off. On the other hand, if the heat-

ing be carried too far, an important change takes place; the surface of the glass actually becomes in a molten condition, and attacks the iron oxide of the colour, the silica of the glass combining with it to form a transparent silicate of iron, and thus the density of the painting is very much reduced—may, in fact, if the heating be carried very far, almost entirely disappear. These facts, taken in connection with the differing hardnesses of different glasses, will serve to show how delicate an operation the firing really is, and how necessary it is that it should be superintended by a skilled and intelligent workman, and not left to the care of a mere labourer, as is too often the case.

In this connection it is well to mention a condition in the fired glass often brought about by an unskilful kilnman, and known as "sulphuring." The painted surface has a black, metallic appearance, and the glass becomes clouded and opaque, and is frequently, for this reason, quite spoiled. This phenomena is attributed—as the name given to it implies—to the presence of sulphur in the fuel, but is, as a matter of fact, due to the reducing action (the lead in the flux being reduced) of the products of combustion present in the kiln. This may arise from two causes—either the kiln has not sufficient draught to completely burn the fuel and carry off the products of combustion, or the combustion is retarded through mismanagement of dampers and neglecting to clinker the fire-bars. This latter is almost invariably the real cause, and a neglect in this direction should be suspected whenever sulphuring makes its appearance.

G. E. W.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

DOMESTIC ARCHITECTURE IN THE EASTERN STATES OF AMERICA.

A SPECIAL general meeting (business) of this Institute was held at No. 9, Conduit-street, Regent-street, W., on Monday, Mr. H. L. Florence, Vice-President, presiding.

The resolution passed at the special general meeting held on the 4th inst., suspending By-law 20, to allow of the present President's term of office being extended for another year, was duly confirmed.

The Lords of the Privy Council having raised certain objections to ambiguities of wording in the additions and amendments to By-laws 30 and 9 as resolved upon at the special general meetings respectively held on June 14, and November 13, 1897, such additions and amendments were altered by the meeting as follows:—(a) By-law 91—Provided always that when the Council of the Institute receive a unanimous recommendation formally submitted by the Council of any allied society that a practising member of the profession is eligible and worthy of being elected as a Fellow, the Council shall, during the five years from the date of approval of this provision by the Privy Council, have power to elect him, if in their opinion his work be of sufficient merit. The Council shall also have the power to elect annually to the Fellowship without ballot the President or President-elect of any or all of the allied societies who may be eligible and apply for admission. (b) By-law 30:—To alter the words in the antepenultimate sentence "the said meeting" to "the close of the last general meeting in June."

To alter in the last sentence of By-law 31 the word "first" to "last."

The twelfth general meeting (ordinary) was then held.

The Chairman announced that Signor Giampietri, one of their latest honorary members, had presented the Institute with a water-colour drawing of the Stylobate of the Temple of Antoninus and Faustina in the Forum at Rome.

Mr. A. N. Paterson then read a paper entitled "A Study of Domestic Architecture in the Eastern States of America in the Year 1896, with special reference to Questions of Plan, Construction, Heating, Drainage, &c.," of which the following is an abstract:—

In opening his subject, Mr. Paterson said that the first colonists carried with them to America not only the language, the laws, and the flag of the old country, but its architecture also. In what was known as "Old Colonial" would be found reproduced, with such modifications only as ensued from the adoption of wood instead of brick or stone, the buildings

of the time of Queen Anne and the first Georges. Influenced, however, by new conditions of climate, of materials, and of class relations, and impelled by a constant and steadily increasing influx of wealth and demand for comfort, America had produced a type of house characteristic and original. From an artistic point of view, the best examples equalled, if they did not surpass, the highest standard of work in Great Britain; while as regards convenience and comfort, the type was superior to that common in England, and one from which English architects might learn much. Having shown that climatic conditions were responsible for the open type of plan characteristic of the American house, Mr. Paterson referred to a few of its more distinctive features—the cellar for the heating apparatus, which also had an important part in determining the scheme of drainage; the complete system of heating, reducing draughts to a minimum, allowing double doors of extra width to be wide open, and leading to the almost universal adoption of sliding doors; the effect of spaciousness, even in small houses, due to the large hall and open doors; the verandahs, which had greatly developed in suburban and country residences, and become a characteristic feature in plan and elevation; the bedroom "closets," or receptacles for wardrobes, chests of drawers, &c., the heating system rendering the bed-chamber available as a secondary and independent sitting-room or snugger, folding beds being largely used; the service-rooms, a marked feature of the American plan, less isolated than in the English house. Types of town houses were then referred to in detail, the lecturer selecting examples of the self-contained residence. The houses of the wealthy conform more to the European model, with American characteristics confined to matters of detail. Appreciative reference was made to examples of self-contained residences at Washington, in which the art of planning is admirably exemplified, the awkwardness of the site being turned to advantage, with due regard to the scale, proportion, and symmetry in the disposition of the apartments. Here, too, brick, the material of the country, has been employed in a natural and simple manner, with commendable reticence in design. The lecturer then followed with a description of apartment houses in New York, their appointments, rents, &c.; workmen's houses, with which New York is but very poorly provided; suburban houses, dwelling particularly on an example at Brookline, of which a complete set of plans was exhibited; and various types of country houses and summer resorts. In his observations on construction and materials, which were treated at considerable length, the lecturer referred to the steel-framed construction, so largely employed in the tall buildings of the States, as exerting a very pernicious influence on the architects' art from the point of view of sound architecture. Buildings were constructed on the principle of a steel cage, divided horizontally into layers, with no internal supports to speak of, and the whole sheathed with an apparently—but utterly sham—constructional skin of granite, stone, brick, or marble. The stone corbelling under the projecting oriel, a constantly recurring feature, is, in nine cases out of ten, a sham. Window mullions, themselves probably formed of stone sheathing round a steel core, are carried by steel cantilevers bolted at the back into the girders of the floor below, and the correctly designed and jointed corbel courses with difficulty carry their own weight. The expense of stone was offered as an excuse; yet the same house had its marble, mosaic, and hardwood finishings, at a cost ten times what would have sufficed for making the construction honest. For roofs, floors, and partitions, fireproof construction is now generally adopted in all important domestic work in the cities. The elaborately constructed brick and terra-cotta arches between the girders, common in England, are not used in the States for floors to be subjected to lighter strains. Floors with tension members are coming much into vogue. In the construction of flat roofs an extensive use is made, in combination with other materials, of "roofing paper" or felt, laid in several thicknesses and bedded in tar. Most commonly the outer skin is of copper, laid either directly on the concrete, or on wood and felt, in sheets 12 in. by 24 in., and with soldered joints. Partitions are commonly built of hollow blocks of porous terra cotta. Tiles of similar type are used for casing structural steel work, and in some cases instead of lathing on the internal

* A glass closely corresponding to the formula—K₂O, 3 SiO₂.

wall face. Thin fireproof partitions, finishing from $1\frac{3}{4}$ in. to $2\frac{3}{4}$ in. in thickness, are much in favour from the saving of space affected. These are mainly constructed by using channel or flat bars with expanded metal lathing or burlap between, plaster with hard-setting mortar on both sides. Some interesting particulars having been given of methods of construction in vogue for country and suburban houses, the lecturer went on to discuss the various systems of heating employed, observing that Americans regarded our system of open fires with something of the same feelings as we did the apathy of some of the more outlying countries of Europe and the East concerning modern ideas of sanitation. Nevertheless, the fireplace is as general a feature in American as in English houses, serving as an effectual ventilator, and valued for its cheerful appearance and the decorative character of its surroundings. Steam, hot water, and hot air are the means of heating mainly employed; the two former being much the same as used in public buildings in England. Warming by hot air, essentially applicable to small areas, and almost unknown here, is practically universal in the States for all houses costing about \$6,000 (£1,200) or less. In the smaller class of city houses, in apartment houses, and hotels where the limitations of space render a multiplicity of air flues embarrassing or impossible, and where its superior cheapness is of importance, direct radiation, either by steam or hot water, is universally adopted. In the more luxurious and expensive city houses indirect radiation is the invariable system. In the largest mansions the assistance of an electrical or steam-driven fan is invoked to regulate the distribution of the heated air, which is also screened and moistened as required. In treating of these methods of heating, after a brief reference to one or two special forms of installation, the lecturer dealt more fully with the hot-air system as being least known in England, illustrating his description by diagrams of the apparatus, the furnace, cold-air supply, and hot-air flues. In matters of plumbing and drainage, which were next discussed, and described in minute detail, the lecturer said America had made great advances and was far ahead of England. This progress was mainly due to the stringent laws adopted by the city "Boards of Health," and rigidly enforced. Before building, complete sets of plans and sections showing plumber work and drains, to the scale of a quarter of an inch to the foot, had to be deposited with the Boards. On these the nature and positions of every fitting, pipe, and trap must be clearly indicated. Draft specifications, some clauses from which the lecturer summarised, are issued by the authorities for the guidance of architects. Two main characteristics are apparent in this class of work—viz., the openness of everything, and the substitution, along with cast-iron for fireclay drains, of wrought-iron and brass for lead in the supply and smaller waste pipes. The lecturer closed with a description of the "Waring" system of sewage disposal for isolated houses and small communities, which is employed very generally throughout the Eastern States, and with entirely satisfactory results.

Professor Kerr, in proposing a vote of thanks to Mr. Paterson for his paper, said that it would be impossible that night to discuss the great mass of details which he had furnished with reference to the internal contrivances of American houses. Keeping himself strictly to the plans, he had to point out that there were several national characteristics and peculiarities affecting those of American houses. In the first place, there was the question of climate. Now, it must be apparent to any one that in the United States of America there are a great many more climates than one. This would remind those of them who had studied Richardson's designs of this suggestion that, without originating novelty, Richardson mainly adopted the characteristics of the South and applied them to the eastern counties. Another important question was that which the lecturer had mentioned under the phrase, "the difference of class relations." The relations between master and servant as they exist in Europe did not exist in America. There the servant considered himself as good as his master, and, in some instances, a great deal better; and the maid told her mistress the same with the utmost satisfaction. That created a difference of social discipline as compared with what exists in this country, which was of the utmost possible im-

portance. What the lecturer had described as his (the speaker's) dictum, that there should be a separation between the two families—the family properly so called and what he called that of servants—was not his dictum at all. It was the universal doctrine which pervaded the gentleman's house in this country, and which was carried out by Mr. Burn, who was historically the prime minister of plan. There was another peculiar characteristic about the Americans which was not easily explained, viz., their fondness for hotel life. It was not that they preferred to live at a hotel or go out of their way to live in one, but the way in which they occupied their houses was very much like hotel life. There was an element of deception observable in some of their plans. He took as instances the plans of the two houses in Maddison-avenue, in New York. One house was very large, evidently intended for a gentleman, an American of considerable wealth, determined to exercise his right to have a display. The whole length of the house from back to front—it was the corner one—was occupied by a dining-room at one end, a reception-room next, then what was called a foyer, next another reception-room, and the drawing-room in front, a magnificent staircase being placed in the middle of the whole series of rooms. These constituted a single suite—a professional suite by wide folding doors. That would not do in this country. The only other case of the kind that he knew of was the house of the gentleman who told him that he wished his house designed in a very peculiar way. It was to be perfectly comfortable for a small family according to English tastes, but was to be so arranged that it could be thrown open upon occasions into one suite for receptions. The gentleman to whom he referred stated that people were good enough to invite him out a great deal and that this was the only way he could return the compliment. But the gentleman in Maddison-avenue had sacrificed the comfort of his house entirely. He had not done it in the French but in the American manner, from which he thought they in London could derive no suggestions. Upstairs, again, he had a similar suite. A magnificent staircase, a large pretentious hall, a library, a card room, and a billiard room, the whole forming one grand suite. He had two reception suites, and nothing else in the house. Then there was a little house of which their friend had spoken with very great approval. He called it an exceedingly badly planned house, and one which was uncomfortable to English notions. Then there was the matter of sliding doors, on which the lecturer laid some considerable stress. How would the people of this country like to push aside and march through such doors? It would not do at all. That was the hotel life of which he spoke. The American liked to live in his own house as in an hotel. That was the Latin way of living. The Latins founded their house on the open court without a roof. The Goths founded it upon the confined and enclosed plan. The Americans, differing from us as regards climate, accepted the Gothic idea, but they got the Latin principle introduced, and it was in this way their peculiarity in planning arose. Another peculiarity of theirs which was worthy of notice was the bedroom closet. That would not do in this country; it would get stuffy, and the dust that would come out of it from one's clothes, the portmanteau, and such things, would be most unpleasant. That was declared, and he believed properly declared, to be a *sine qua non* of the American house. Then there was the folding bedstead:—

"A bed by night, a chest of drawers by day."

Was that, he asked, a desirable thing? There, again, was evidence of the hotel life. The occupant of the bedroom under the conditions mentioned had no privacy such as we had. The privacy of the bedroom pervaded all the country houses in this country. One plan submitted to them was well worth studying—that of a house at Shamrock Cliff, Newport, the one with two slanting wings. One of its curious features was what was really an open shed of an ornamental character, in which the inmates could accommodate themselves in the sunshine or on pleasant evenings upon a veranda, from which, of course, we in this country could get some suggestion. Then there was the tenement house, of which a plan was exhibited, and which he thought a very faulty plan. Apparently they went in by the door and fell into the kitchen. Then, if they went upstairs, they would find a parlour and the hall. The

idea of the hall being upstairs! The Americans did not make the same use of the hall, as we did, but that was because they did not know better. There were houses in this country where the hall was made a feature, and this had been greatly developed in the towns. The hall was intended as a rendezvous, not as a mere passage, and when a hall was made for that purpose, as well as a lounge, it added immensely to the comfort and convenience of the residents of the house. The Americans did not seem to manage things properly. They made the whole of the house a string of doors, and these they kept open. That was contrary to English notions of comfort and convenience. In regard to servants, though some difference of arrangement might be required according to American ideas, he still maintained there ought to be two divisions of the family. What he had always contended was that the servants were entitled to their own privacy, just as much as the family.

Mr. Statham, in seconding the vote of thanks, said that the paper would prove most useful to them when they got it printed with some of the diagrams. There were one or two points on which he would like to touch, and which were typical of the American house, and with regard to these, while a great deal of what Professor Kerr had said was perfectly true, he could not help thinking that the study of the American plans would give them suggestions for getting a little way out of the ordinary course of house planning. It was a question whether, with the more scientific system of heating now available, they could not give to smaller houses a greater appearance of space and dignity than they were able to give them by their ordinary system of cutting them up into closed rooms. He might say that something of the American house idea had been carried out no further off than Wimbledon Common, by a great English painter. The gentleman he referred to planned it himself on a kind of cathedral plan, in which the hall was the nave, the drawing-room took the place of the chancel, and the study and dining-room constituted the transepts. The whole was heated by hot-water pipes, and the various portions could be shut off at pleasure by the drawing curtains. This formed an interesting variety of house plan, and it had the advantage of giving to an ordinary sized dwelling-house an appearance of spaciousness which could not be obtained on the usual English plan. In the summer time the inmates could roam about the house instead of being shut up in one room with the door closed. This was a suggestion well worth considering, and it was arrived at by the owner, he believed, quite independently of American suggestions. Besides this point of leaving the house more open there was also a great deal of suggestiveness and originality in the American plans; for instance, in regard to the shape of the rooms, the Americans did not confine themselves to squares and parallelograms as we generally did; they introduced frequently oval or circular rooms, shapes which were not in every respect the more convenient, but which presented great opportunities for variety of architectural effect and treatment.

The motion having been carried unanimously,

Mr. Paterson offered a few words in reply. He wished it to be understood that he did not bring forward the American plans with the view of putting them before English architects as superior to what they had been accustomed to. He made them the objects of his study and brought before them the results of his study, leaving it to them to reject or accept them as they felt inclined. On the matter of openness of plan, he had tried to show that this was a national characteristic which was partly suggested by the system of heating the whole house. A house being equitably warmed, there was no necessity, unless for privacy, for doors. Privacy was foreign to the tastes of Englishmen, and in so far as spaciousness and openness was disagreeable to them they were at the same time of some advantage in the treatment of smaller houses. With regard to the bedroom closet he had to say that when kept properly clean, and with a window, it was distinctly a desirable addition to the house for the storage of linen or a portmanteau. As to the folding-bed he had to point out that this was only to be found in the poorer class of house.

The proceedings then terminated.

LESSONS FROM FIRE AND PANIC.*

It is a question whether danger from fire is increasing in spite of Building Acts. Our dwellings are getting more lofty, more closely packed together, and more thickly inhabited. Commercial buildings the rooms are larger, more encumbered with goods, amongst other things, and more manufacturing processes are carried on. There is more machinery actuated by steam. The timber we use is more easily combustible, fittings are lighter, and everything is kept warmer and drier. All our arrangements for obtaining light, from the lucifer torch to gas and mineral oil and electricity, are novel and productive of new dangers. The portion of window openings to wall space much increased, and with the growth of costly outside or trustfulness within, the old-fashioned solid window frame that stood out with the face of the wall, and, being dangerous, had to be abandoned, is going through several stories neutralising the advantage of fire-resisting floors, lighting is common to different premises do away with the security of the party-wall. Unrestrained skylights bring ridicule on the incomplete roof covering of the Building Acts. To erect the most scrupulously legal building of stone or slate may be no more than a wall of grates in which its internal structure is so contrived that it can be most conveniently destroyed. So in the Cripple-gate fire, the progress was about as rapid, and the destruction its limited area no less complete, than in the Great Fire of 1666; and if our arrangements for the extinction of fire had not made some progress this recent event might have ended that great calamity.

Our own lesson from this must be to improve the means the construction and arrangement of buildings, even though we may be in advance of Building Acts. We cannot widen the streets, nor increase the unoccupied areas, nor close the necessary openings for light, nor take to the trader modes of conducting his business which would make his business impossible can we do much in advance of public opinion to diminish the numbers of an audience that read them over a larger area. The most we can do is to diminish the chances of fire, and to delay its progress, to prevent its getting from room to room and from house to house, to so arrange the construction that it may be more easily put out; and as regards the safety of the inmates, to provide the best means of escape.

Points which I think most useful to notice are the following:—

The structure and arrangement of buildings

Certain legal and other provisions for prevention of life in dwelling-houses.

Certain legal and other provisions for prevention of life in factories.

Certain legal and other provisions for prevention of life in public buildings generally.

Certain legal and other provisions for prevention of life in theatres and music-halls.

With respect to the structure, the party-wall separation between buildings is, I think, vital if no illegal openings are made in it, either or not it need be carried up through the roof has been a question, but no satisfactory answer seems to be forthcoming as to the danger of fire by party-walls that are not so built up. When the London Building Bill of 1893 was before Parliament, the Committee took a great interest in this question, and decided that the old height of 15 in. above the roof should be raised in the case of a warehouse to 3 ft.

Openings in external walls, where the streets or back areas are narrow, we want that will delay the passage of fire from one side only, if only for half an hour, and will obstruct the passage of fire from within. It may be found useful. The common openings in external walls, and the provision of fire-resisting blinds occupying little space, are formed by what are supposed to be external walls, and the provision of fire-resisting blinds to the openings in them is more necessary. Every contrivance of fire should be easily closed, and should be fully closed every night.

A quite unable to understand the slow

paper read by Mr. Thomas Blashill, architect to the London County Council, at the meeting of the Institution at Manchester on Wednesday last.

progress made in this country by the fire-resisting floor. In Paris fire-resisting floors were common five-and-thirty years ago. I was then carrying out such work here on a large scale, but the case was exceptional; the weight of the floors was great, the walls had to be thickened, and the cost was excessive. Cheap steel and light substitutes for concrete have changed all that.

In the Cripple-gate fire, although many of the warehouses were modern, and some had already been burnt out once or oftener, there was not a single fire-resisting floor. There were wooden floors carried on iron girders, but we are familiar with the behaviour of wrought-iron girders under such conditions. They expand and contract so as to overthrow the walls, or they become soft so as to hang down like tapes. There are now available fire-resisting floors in great variety, in which the iron is more or less protected from the fire. In using them care must, however, be taken that no leakage of gas can accumulate in any hollow spaces. I have seen a large and handsomely decorated house in which fire-resisting floors were used in conjunction with battened walls. Upon applying a light in the usual way to the suspected point of escape, the mixture of gas and air accumulated in the hollows exploded, and the ceiling with the wall battening in two stories was stripped away, littering the floors and mixing with the broken window glass. In that case there were also several personal injuries.

In the great re-housing schemes of the London County Council, I have made every floor fire-resisting by the use of steel joists wide-spaced, and filled in solid with coke breeze concrete, upon which the floor-boards are nailed, the plastered ceiling being done under the concrete direct. The cost is no more than that of a good wooden floor, while the total thickness is only 7 in., which saves 2 in. or 3 in. in the height of each story. They are not complained of by the tenants in respect of noise, but in a house where this would be of great consequence a cork covering to the boards under the carpet would be a sufficient remedy.

If it is necessary to adopt wooden construction for floors, the ordinary pugging should at least be used. Joists of double the usual thickness placed 2 ft. apart, and filled in solid with some form of concrete, would offer great resistance to fire. As to the material for pugging, coke breeze and cement concrete, mixed four parts to one, stands fire and water better than anything else. In Switzerland they use coarse plaster stuff, into which long wet shavings have been stirred as hair is stirred into plaster for ceilings; and this, though an imperfect substitute for concrete, will resist a fierce fire for a considerable time, but more experience is required in the use of light solid materials.

I think we are now arrived at a time when architects at least should try to secure an incombustible roof. This is stipulated in the building leases of some very important London estates, and I am told that it raises no difficulty. If the space in the roof is wanted, pugging or concrete is sometimes put between wooden rafters. If a steep roof is necessary, sheets of asbestos put in the roof boarding in place of felt will afford some protection. In a building professing to any degree of fire resistance the roof should be protected by a ceiling of concrete put over the topmost story. Ceiling on perforated or expanded metal will give some protection against a small fire.

As to partitions, lath and plaster should be quite abandoned, and brick-nogging also, for a half-brick wall in cement is as easily constructed. There are many kinds of thin partitions from which to choose. I commonly use coke breeze cement concrete 2 in. in thickness, which is light, tough, and strong enough for stories of the ordinary height. Old lath-and-plaster partitions may be filled in with this material or with brickwork by removing the plaster from one side only. If the structure is otherwise fire-resisting, any wooden panelled partitions may be considered as fixtures and disregarded, particularly if in hard wood.

I mention these and similar details not as being unknown but as being too often neglected, even where the cost would not be a serious item. If fire-resisting materials were in more regular demand, workmen would become familiar with them and they would cost less. Exaggerated estimates of the cost of fire-resisting construction do much harm. Very important steps can certainly be taken in that direction

with very little extra cost on ordinary construction.

The great danger of a staircase arises from the cupboard underneath its lower flight, which will probably be stored with combustible materials. If it is constructed of thin deal it will take fire easily. If more solid, or made of hard wood, it will resist a small fire for some time. If it is to be fire-resisting, concrete is safer than stone. But if everything about a staircase is incombustible it may be rendered useless by accumulated smoke arising from such a cupboard as I have mentioned, or from an adjoining room.

There are certain precautions necessary in construction whether the materials are fire-resisting or not. I have already suggested the danger of hollow floors and hollow partitions, but all hollow spaces that can contain gas or transmit flame or inflammable vapour, or will even allow a supply of air to pass towards a fire, are highly dangerous. The lining of walls with matchboarding is the most ordinary case of this kind. By means of it fire communicates instantly all over a shop, and up through the floor to the rooms above. The hollows formed in heavy plaster cornices and the hollow spaces behind skirtings transmit flame or inflammable air without any outward warning to adjoining or even distant rooms. One instance or two will illustrate this.

In a fire near Clapham Junction that originated amongst the Christmas decorations in a draper's window, the smoke and flames passed in this way to the upper floor so quickly, that two girls at work over the back part of the shop lost their lives, although there was an easy means of escape by getting out of the back window on to a flat. In a similar case several persons, probably seized with panic, jumped from first floor windows into the street, instead of stepping out at the back. These are indications of the quick effect of fire in a badly constructed building.

As to the passage of fire or inflammable vapour by hollow spaces, cases have happened where the origin of a considerable fire was inexplicable until it was traced back to some source at a considerable distance from the scene of the damage. In a "fireproof" building, a workman hung his coat in a cupboard leaving his pipe in the pocket. The coat took fire and fell, setting light to the skirting, behind which a small hole had been left in the brick internal wall. The floor-boards of the adjoining room had been laid on wooden strips that stood above the surface of the concrete. The fire passed along the hollow space, doing three thousand pounds' worth of damage in this fireproof building. Unless the elasticity of a floor is an object, the boards should be nailed down on to a surface of coke breeze concrete.

If no more serious measures than those I have described are taken in respect of a purely domestic building, they may give very material security as to its behaviour in case of fire. For many years past companies have been erecting artisans' dwellings in London, one of them having put up blocks containing nearly six thousand tenements. In only one case has a fire extended from one tenement to another. This is due to generally careful construction, though there has been no rigid adherence to the principles of fire-resisting principles.

In these descriptions of the parts of a fire-resisting building the work of the carpenter is practically excluded, and there are many buildings in which this principle should be carried out. There is, however, much convenience in the use of timber, and, if posts and girders are made in large sizes, they are safer than if made in iron. Solid floors made of deal joists set close together withstand fire for a long time, but are ultimately destroyed by great heat.

Many attempts have been made to render fire timber fire-resisting or slow-burning by chemical treatment or by covering it with paint. Some of these applications are useful when applied to textile fabrics and to thin slips of wood, but I have been unable to meet with any process that renders the mass of a joist or beam fire-resisting throughout. This is a matter well worth further inquiry and experiment, for joinery at least might be protected in this way. As to the public experiments sometimes reported, those in which tar or mineral oils are liberally used are untrustworthy, for these are light-giving and smoke-producing liquids, and do not imitate the conditions of an ordinary fire.

Although we may succeed in rendering new buildings satisfactorily fire-resisting, a much

more important question for the present generation is the improvement of the condition of old buildings. This is well worth the attention of those who have the charge of building estates already covered, of ordinary towns, property, or of those old historic mansions filled with family treasures, one of which as I write has been added to the number of those wrecked by fire. In an ordinary building, purely domestic, if the joists are not strong enough to carry a filling-in of concrete they will carry ordinary pugging, and if no more than a breadth of 3 or 4 ft. all round a floor is well filled in on some fire-resisting system, every hollow behind adjacent cornices, skirtings, and partitions being carefully stopped, a very considerable amount of resistance to fire will be afforded. If besides, the points of contact between chimney stacks and floors and roofs be examined and timber cut away, the condition of an old house might be made approximately as good as that of a new building. In certain cases, where a domestic building is changed into a public building, and where a building partly domestic and partly used for trade is increased in area, under the London Building Act something of this kind has now to be done.

Even more important than these details of construction is the question of arrangement of buildings with the view of preventing loss of life from fire. Warned by frequent disasters, the legislature has from time to time made provision for protecting persons from sudden fire and panic, and for insuring to the inmates of certain buildings reasonable means of escape.

Examination of this kind must be thorough, for it is difficult to exhaust the possibility of mischief caused by careless workmen in old or in modern times. I have found in an old house the brickwork of a chimney breast cut away to enlarge a cupboard, a thin board being substituted, which had evidently done duty for years in that position.

And with regard to any building, the architect cannot be too cautious again assuming that reasonable care will be taken in managing it. Most houses are at times, often for a very long time, left in the hands of people without any sense of responsibility. That is an additional reason for making every structural provision against the chance of a fire. The fate of Cowdray House, in Sussex, though the story is a hundred years old, contains nothing that might not now be paralleled.

The mansion, which was one of the grandest in the country, was being repaired and decorated in preparation for the owner's wedding, and it was left in the hands of caretakers and workmen. All the more valuable of its contents were temporarily stored in a gallery, and a room close to this place was selected for the carpenter's shop, the fires being closely surrounded with shavings. During the night on which all was finished fire was observed in the workshop. The neighbours assembled. The moat was full of water, but nobody could find the key of the engine-house. The destruction was practically complete.

The London Building Act, 1894, provides by Section 61, that every building over 30 ft. in height used wholly or in part as a dwelling-house or factory, and having a parapet, shall have a dormer window or door opening on to the roof, or a trap door with a fixed or hinged step-ladder leading to the roof, or with other proper means of escape. If there happens to be no parapet there is no such provision. I venture to think that it would only be ordinary prudence to make this provision in any house or factory where there is reasonable doubt as to the means of escape by the ordinary route. Section 62 partially meets this view by requiring that any story in the roof, the floor of which is over 60 ft. above the street, shall be constructed of fire-resisting materials; and Section 63 provides that every building over 60 ft. high shall have on the stories, where the floors are over 60 ft. above the street, "such means of escape in the case of fire for the persons dwelling or employed therein as can be reasonably required in the circumstances of each case." No such stories can be occupied until the London County Council certifies that this has been done. This is new legislation, and it has now become a very important part of the duty of the Council to say what can be reasonably required in such cases.

The height of 60 ft. is fixed because that is the greatest height to which a movable fire-escape will reach, and without some special provision the only means of escape from these high stories would be by descending, if that

were possible, to the lower stories, and increasing the number of persons there in peril. Schemes to be applied to lofty hotels and houses, more or less crowded at night have come before me in great variety, many of these very inadequate. It seems clear that the law, which leaves the occupiers of floors up to 60 ft. in height to take their chance, intends that those on higher floors shall escape. They may have a gallery or an iron ladder or staircase for access to the roof of an adjoining building, or a series of ladders may be contrived that will conduct them clear of the windows of the burning building down to the ground. But 60 ft. is a great height from which to expect women, children, and sick persons, scantily dressed, suddenly alarmed in the night, and for the first time in their lives, to descend by an external ladder, in any weather, and probably in the dark. We may realise the condition in which people escape from the account of a fire that happened at the Scottish mansion of the Duke of Argyll, in which praise was given to the Princess Louise for her presence of mind in running back from the garden to get stockings for the rest of the household who had rushed out barefooted. For people in that condition steep ladders with ordinary rounds are useless. They must be of tolerably good slope, have flat treads and hand-rails, and there must be suitable protection where necessary against falling into areas or through skylights. The escape door must have such fastenings only as can be easily opened from within. It must be easily found by night, and the bottom of the escape must be in some open space quite clear of danger. But whether the escape delivers to the ground or on to some willing neighbour's roof, there is risk that it will be made use of by burglars and by inmates of both premises for improper purposes. If a separate staircase leading down to a separate door of exit is provided in the building it will very likely be allowed to go out of use, and will be turned into a store place for lumber. On the other hand, if the construction of dwelling-rooms above the 60 ft. limit is of very great consequence, the owner may reasonably be required to make and keep up such arrangements, however costly, as will be really efficient.

By the 74th Section of the London Building Act, when a building over 1,000 ft. in area is used in part for purpose of trade and manufacture and in part as a dwelling-house, the two parts must be separated by walls and floors of fire-resisting materials, and all means of approach to the dwelling-house portion must be constructed throughout of fire-resisting material. But the walls of staircases and passages may have openings fitted with fire-resisting doors to communicate between the two portions, for which purpose hard wood 2 in. thick is reckoned fire-resisting. For staircases, hard wood 2 in. thick is also permitted, and good concrete when filled in between the joists of floors is fire-resisting.

It will be observed that the term "fire-resisting" is used and not fireproof. The construction must not add fuel to the fire, but resist it for at least a considerable time, during which the inmates of a building may escape and fire appliances be brought to bear. If the contents of the room or even of the building cannot be saved, so much the worse for the owner or the insurance company; but the fire should rarely extend to the adjoining apartment on either side or to a story above or below, and the smoke should be kept from staircases and passages. This means giving to adjoining sections of a house as nearly as practicable the same protection against each other as a good party-wall affords to the inhabitants of an adjoining house.

By the Factory Act, 1891, every new factory in which more than forty persons are employed must be provided on the stories above the ground floor with such means of escape in case of fire as can reasonably be required under the circumstances of each case. Every old factory must, after notice, be similarly provided, subject to arbitration in case of difference. The Factory Act of 1895 extends these provisions to certain workshops and laundries. I think that the chief fatalities during recent years have been in factories employing less than forty, but there are other provisions for safety and for facilitating escape which may be put in force by the inspectors if the provisions above mentioned are not applicable. As to the application of these structural provisions, it has been said that if the workpeople on the upper floors are provided with means of getting to the ground

floor they cease to be subject to the Act, but this view does not seem to be supported by the words of the Act, which require that such persons are to have "means of escape," and the ground floor might be on fire and not available for that purpose. These persons, therefore, must have means of getting clear of the building either into a street, or into an open yard of ample area. In a confined yard they would be subject to the glow and heat of the fire, and this is fatal. Many of the victims at the Paris Bazaar fire died in the open yard at the rear, which was of some size but which afforded no shelter from the fire.

The circumstances of each case which the authority or the arbitrator are to take into account appear to be such as arise from the nature and quantity of materials used, the processes employed, the danger from lifts which will communicate fire and smoke, the number of workmen and workwomen respectively, and the description of the premises surrounding the factory. It is sometimes argued that "the circumstances of each case" which are to be taken into consideration include such as arise from the insufficiency or inconvenience of the site, the owner's system of supervision, or other matters which might have been foreseen and provided against in the selection of the site, the construction of the building, and that allowances should be made for such matters of difficulty. But there must, at any rate, be means of escape, and those which may be sufficient in an ordinary case may reasonably be increased and not omitted if the site, or the buildings, or the system of management are worse than common. If a factory has combustible floors and roof, the requirements must be more stringent than if it is fire-resistant throughout. But unless the plan is satisfactory, the smoke from a very small fire will quickly spread, disabling the workpeople or causing sudden panic, whether the building is fire-resisting or not.

Some of the causes of danger are the inflammability of the stock, the way it is allowed to accumulate, so that insufficient room may be left even for passages, the chance that access to staircases may be cut off by the fire, the insufficient width of the staircases, the arrangement of their steps, and their liability to become filled with smoke. As in theatres there should be alternative means of escape to different extremities of the building, the rooms may be united by a doorway, each room having its staircase at the other extremity, two buildings having their own staircases may be united by a bridge on each side. Generally the staircases should be of concrete, secondary staircases of minor importance being of oak or teak, the treads to measure 7½ in. the width 3 ft. 6 in. to 4 ft. 0 in. There should be a fire-resisting enclosure for each, with self-closing doors opening by pressure in the direction of each, but not so as to obstruct the landings. The staircase should be well ventilated and should adjoin an external wall. If that is impracticable, it should communicate with the street by a very slight passage of fire-resisting construction. The roof of the staircase should be fire-resisting, iron or other fixed sashes are to be used and should be made to open, so that persons could be rescued by means of them.

I will here allude to other means of escape which are no doubt contemplated. Iron external staircases kept clear of windows through which fire can pass may be constructed. Movable fire-escapes are to some extent recognised, for the factory inspector may require them and the magistrate may order them. But these are things properly within the duty of the tenant, and do not seem to be what the Acts require of the owner, whose duty it is to put his building into a proper state structurally. Movable escapes are not satisfactory as substitutes for structural requirements. When new staircase was demanded in an old building the occupier pointed out that there was a movable escape ready to be let down at once the windows. When asked to show how it worked, the window was found to be fastened down, and he proposed to send for a carpenter who was in the basement. I need not enlarge on the risks of such contrivances when used by persons not in the frequent habit of using them.

Escape downward by means of the stairs, being liable to interruption by fire and smoke, other means must be made available. Very little has so far been done to provide escape by the horizontal route towards adjoining buildings.

gs or upwards through the roof. To both these there are, however, serious objections. The London Building Act prohibits openings rough party walls between houses in different occupations; besides which, few people could run the risk of the improper user of such convenient modes of getting from house to house without the knowledge of the owners. The late Sir Henry Bessemer showed me an ingenious arrangement by which this last objection as sought to be removed. An opening only 1 in. wide by 3 ft. 6 in. high was made in the party-wall at a foot above the floor level. On each side was a very strong iron door and frame, the inner side of which was a pair of lockers. On an alarm of fire in either house the inmates would open their own door, and ply the knockers on that of the neighbour, who might be expected to come quickly to the rescue. The outside balcony is a much better arrangement, and if it could be generally adopted on each story, or only for alternative stories, there would be in most cases reasonable facilities for rescue. But the balcony, though a beautiful architectural feature, is almost unused in this country. It might cause apprehension of improper access from house to house, or from room to room. I have, however, lived for many years in a district where every house has a spacious balcony above the ground story, and I have not heard of this objection. There is an easy means of passing in the window of one house to the nearest window of the adjoining house by fixing a short length of balcony between them, crossing the roof of the party-wall.

But the best means of escape after the staircase is by way of the roof, a good flight of stairs being provided to the roof door, which should have an automatic fastening. The Cripple Gate happened to originate in one of the manufacturing warehouses which was first dealt with by the London County Council under the Factory Act of 1891. The two upper stories were occupied by seventy or eighty workgirls, and the owner willingly put a proper door to lead on to the roof. By this route he and they got away, without it they must all have perished. It was easy as it was, there was considerable difficulty in getting the girls out in the few minutes available, some having fainted or come uncontrollable in their excitement. As the workwomen are usually accommodated, say by hundreds, on top stories, this is a useful son in the construction of means of escape.

do not suppose that roof doors will be generally adopted where valuable stocks are kept, but in a district of warehouses where the premises were properly adapted for escape there might be a watch kept on the roof against fires and the outbreak of fire.

The construction and arrangement of public buildings, that is, places of worship, schools, hospitals, workshops, theatres, halls, exhibition rooms, and other public places of assembly in London, are in certain respects regulated by the London Building Act, 1894. The general construction must be to the approval of the district surveyor subject to a final appeal, but the Act requires that the floors of lobbies, corridors, passages, and stairs shall be of fire-resisting material. Besides this the dimensions of passages, staircases, and of new churches, chapels, meeting-houses, public halls, lecture-rooms, exhibition rooms, or places of assembly are laid down in the Act. Staircases must be carried and enclosed by 9-in. walls, and the corridors and passages shall be not less than 4 ft. 6 in. wide, but if not more than 40 persons are accommodated this is reduced to 4 ft. 6 in. If for more than 400 persons, an additional 6 in. for every additional hundred persons must be made up to a maximum of 9 ft., and the width is over 6 ft. there is to be a landing hand-rail. If two staircases or passages are put instead of one, each must be two-thirds the above dimensions, but not less than 3 ft. 6 in. And if one portion of the building is accommodated over another portion it must have a separate exit. All doors and windows must open outwards, and no outside stairs or bolts are to be fixed.

As regards public buildings in general these are new provisions. They are a somewhat radical adaptation of the much more stringent regulations that have long been applied to theatres and music-halls, and they were very much required.

was once asked by a member of a Parliamentary Committee who desired to ridicule our regulations, why we did not seek to

apply them to churches, and could only suggest the comparative infrequency of accidents in such places. But the reason was inadequate, and Parliament has since recognised this in the above provisions. There are many more accidents in places of worship than is commonly supposed, and the most serious have happened in such places. The crowds are often more dense, and precautions are hardly thought of. One or perhaps two doors are thought enough for many hundreds of people. The organ and the heating apparatus and vestry are in dangerous proximity, artificial light and decoration are on the increase. A senseless panic ensues on the least alarm.

To go back rather a long way, in 1120, the monastic church of Vezelay, in France, was burnt, with 1,127 men and women. And other similar fatalities are found in old records. Some seventy years ago, at a festival, when the cathedral of a South American city was crowded with the whole female population, the elaborate decorations which thoughtless people always add on festival occasions took fire, and 2,000 perished, hardly any escaping. A few months ago some decorations in Pisa Cathedral took fire, and in a panic twelve persons were crushed to death and twenty injured. A few weeks ago, fifty-four people were killed and eighty injured at a fire in a church in Russia. A few days ago, the organ and gallery of a chapel in Hull were blazing when the Sunday morning congregation assembled. If this outbreak had been delayed for half an hour we might have had an object lesson in panic. I mention these matters because the architect will feel that he ought not to provide anything less than the moderate securities demanded by the London Building Act; and if one or two additional doors are required, they are at all times a convenience to a crowded congregation. If the precautions above mentioned are required in a new building, I am unable to see why they should not within a reasonable time be demanded in old buildings as well.

But these are matters in which we must expect no help or sympathy from the persons whose lives are thus safeguarded. Twenty years ago the densely-crowded church of which I was the people's warden had outer doors opening inwards, and with the support of the vicar I insisted on an internal lobby with doors opening outwards. We did this, in spite of unanimous opposition, and as no panic has occurred the opponents may say they were in the right.

A few years ago a thoughtful architect provided to the west end of a new church the only efficient arrangement of exit doors that I have seen, but fitted them with a lock. I went to the opening service to see the result. The place was full even to the standing room, and when the procession from the choir turned to come down the centre passage, they could not advance a step. Then, if ever, was the time to throw open the exit doors; but the key was in the vicar's pocket, and he could not be reached except by means that would have been impracticable, and with delay that would have been fatal in case of a panic.

I think it probable that we may not again hear of the fitting up of one of our great churches for some important function with a forest of timber, in stages and seats and galleries, so that either through accident or through malice, a fire may be raised which might result in a calamity even greater than any that has hitherto been known. At the induction of the Dean of Canterbury, when a great crowd was expected, those in charge of the Cathedral were properly careful, and limited the admissions to those who could be accommodated with a reasonable chance of safety to themselves.

Our theatre regulations are made under the Metropolitan Management Amendment Act, 1878, and have been much strengthened in recent years, largely through the advice of Sir E. M. Shaw, K.C.B., formerly the chief officer of the Metropolitan Fire Brigade, while the application of the regulations has become more stringent as their necessity has been more generally appreciated. They are applicable to all places where the public are invited, for music, or dancing, or stage plays, whether on payment, or by ticket, or free. I can only mention a few of the things which must now be done in the case of a newly-licensed building, and which are demanded so far as is reasonable and practicable in the case of an old building. As to the latter there is an appeal to an arbitrator.

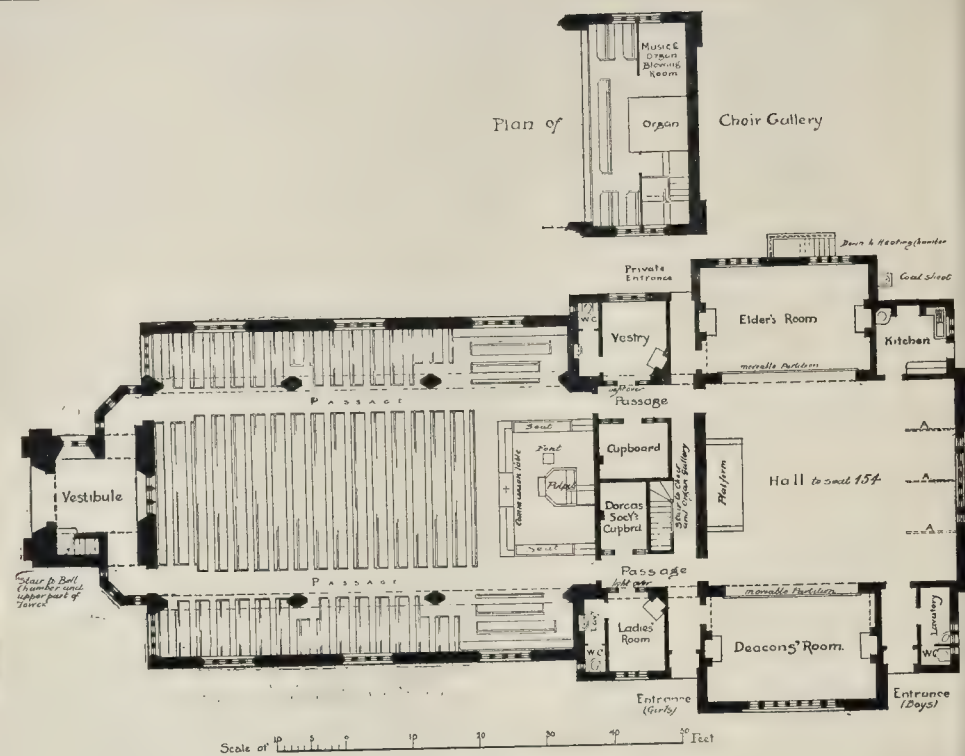
I am not sure that many theatre architects entirely approve every one of our regulations, but some approve certain of them and others probably approve the rest; for, whereas a few years ago not many plans were submitted that would bear examination, there is now a large and increasing number of architects who, so far as their clients will permit them, produce excellent plans and heartily concur in our regulations as a whole. And, as to clients, all the more experienced managers are alive to the risks of their undertakings, and very large sums have been willingly spent by them in the improvement of old buildings. Manchester has taken a good lead in theatre architecture. At the present time, when new theatres are being built in all our London suburbs, and even in small provincial towns, no class of buildings is better understood.

In London the site for a new theatre or music-hall must abut for one-half of the boundary upon public thoroughfares, one of which must be not less than 40 ft. wide. This is exactly one-half of the requirement as to site in most Continental cities, where, as in Manchester, the theatre must be entirely isolated. But our own moderate demand may be relaxed if the building is of small importance or if the design or the surroundings seem to warrant it. We are now actually getting isolated theatres, whereas a few years ago there was not one in London. Not many years ago the owner of a site intended for a theatre would insist on devoting the best portion of his frontage to shops. If the site consisted chiefly of back land the owner would consider it particularly eligible for a theatre. Of such a site I once said to the proposer, "Surely nature intended this for a coal-yard," but he was careful to correct me—it had really been a timber-yard.

Our regulations provide for the separation of dressing-rooms, and such sources of danger as workshops, stores, painting-rooms, property rooms, scene-docks, engine-rooms, and gas meter rooms, and regulate the supply of gas, electric light, lime light, and water. They require a fire-resisting curtain and a high roof with lantern light over the stage. The mischief of windows opening near adjacent property is sometimes imperfectly guarded against by protecting them with hoppers. Recently a fire was caused in a music-hall by an old accumulation of rubbish carried by the wind into one such hopper and fired by burning soot from a neighbouring chimney. Our greatest difficulties arise out of staircases, corridors, and exits.

People who talk of clearing a theatre in two or three minutes fail to realise the suddenness with which smoke and poisonous vapours spread, nor do they appreciate the effect of a panic, which may prevent an audience getting out at all. If a fire breaks out amongst the scenery the whole is alight at once; the vapours make for the upper parts of the auditorium and the people die where they sit. In the great theatre fires it has been estimated that all the victims died from suffocation within five minutes. These are matters which can be reckoned with, hence the provision of fire-proof curtains and high roofs over the stage. But no one can reckon with panic. It needs no fire or other danger. It is a madness to escape from no one knows what. The exits from a public place must allow for panic as well as for fire. Two exits, well lighted by some independent means, must be provided from every part of the building, and as one may be blocked, each must be capable of taking the whole of that part of the audience. They should deliver into different streets. One of these, which will also be an entrance, may be connected with a vestibule that is common to three entrances, and the doorways of this vestibule must be one third wider than the combined widths of these three separate entrances. The least width for an exit is 4 ft. 6 in. in the clear. Too frequently I find that the exits are actually made of this dimension between the brickwork, so that after deducting the thickness of doors and projecting handles, only 3 ft. 4 in. is left. I consider it unfair to expect one to overlook such mistakes in so important a matter.

All exit doors having fastenings must be fitted with bolts yielding to pressure from within. This necessary regulation gives rise to great difficulty. A manager will suspect that persons get access through these exit doors, and also that his servants get out at improper times. In view of the importance of this point, and the impossibility of securing by any system of inspection the opening every night of a door that has locks and bolts, it may be hoped that there



Competition Design for Granard Presbyterian Church, Pulney. Plan

[See page 395]

is mechanical ingenuity enough to get over any such objection as I have indicated.

The impossibility of getting the employees about a public place to understand that exit doors and passages are meant to be at all times free and well lighted may be illustrated from experience. The first new theatre that was opened in my time had been rebuilt after a fire, and the proprietor, confident in his arrangements, invited my inspection on the opening night. I found the exits without lights and their doors blocked by the debris thrown out of the building at the last moment. In another case, a few years ago, the architect had provided admirable exits, but insisted on fitting the doors with locks. In the middle of the first performance I found every door locked and the key at the box office, to be used, I was told, if required. In a third case, when everything had been found in order, a final visit an hour before the opening disclosed that handsome fixed grills were being put to every exit door, only to be removed in case of need. We have found exit passages turned into lumber rooms, or obstructed by spare tables, by chairs intended for extra and illegal seats in the gangways, by perambulators, and by bicycles. In one case the exit was the home of a savage dog. The architect must never depend on the care with which his building will be managed, and, in spite of good intentions, the accumulation of spare scenery belonging to pieces that have been taken off or are coming on and the storing of rubbish is always a danger. In important Continental theatres a separate warehouse is provided as near as possible to, but detached from, the building, and there all scenery and properties not actually in use are kept.

And with respect to this last consideration, experience teaches that in cases of sudden danger no audience, no crowd in a house or factory, and indeed no individual, can be trusted to take the obviously reasonable course to prevent accident or to get to a place of safety. Their escape must be ensured for them by the provision of unobstructed exits that are used habitually, that are as short as possible, and that will take a crowd of people as fast as

they can get away. Thus the planning of a building in relation to its exits is often of even more importance than its materials, or the question of its site and surroundings, which last is a question often beyond the architect's control. I have advised a theatre architect to begin by laying down on his plan eight staircases and ten or twelve exit doors, and then see whether he had room left for a stage and auditorium. This is more reasonable than planning first these last-named parts, and then using up any spare corners for scanty and inconvenient stairs and passages.

There is no class of public building so risky as the parochial or mission hall or club room which exists for purposes of instruction or social recreation. The licensees of such places are very often too inexperienced to feel any sense of responsibility, and the amateurs who usually manage such matters have no sense of danger. Having consented to preside at an amateur charity performance where the stage had been fitted up by the company, I found the footlights to consist of a row of dwarf candles, each being simply stuck down on a penny piece. During the play one of the canvas wings fell upon these footlights.

Unwarned by the Paris disaster, bazaars are got up regardless of the danger from stalls heaped up with flimsy materials and lighted up by Japanese lanterns, without any special means of fire extinction, and with indifferent means of escape. In a particularly bad case, while the chairman of the committee was arguing against the possibility of accident, a lantern took fire and fell. No more than this is necessary to produce the worst of those accidents which such premises may be said to invite, and the contents of only one stall would have sufficed.

In view of the wide range of this paper and the familiarity of this audience with the details of construction, I have for the most part been content to suggest principles upon which we ought to act. And on account of the importance of these questions in relation to the safety of life, I trust we shall agree that there is a moral duty in every one charged with the erection or care of a building to make it as secure against fire

and panic as he can. I confess to some feeling approaching pain when an architect, assuming something like the position of a legal advocate, endeavours to argue that provisions made by law for the safety of life are properly mean less than they are common; supposed to mean, or struggles to get some relaxation of the law which, perhaps unfortunately, the public authority has power to grant. Every relaxation beyond what a prudent man would consider safe is in the nature of a wager that nothing shall happen during the whole time that the building will be in existence, which will call for the particular precaution which, on the responsible advice of the architect, has been injudiciously omitted. It may be that the wager will be won, but the risk is considerable, and always there; and this is consideration which I desire to impress most strongly upon those who are charged with such responsibilities as I have indicated.

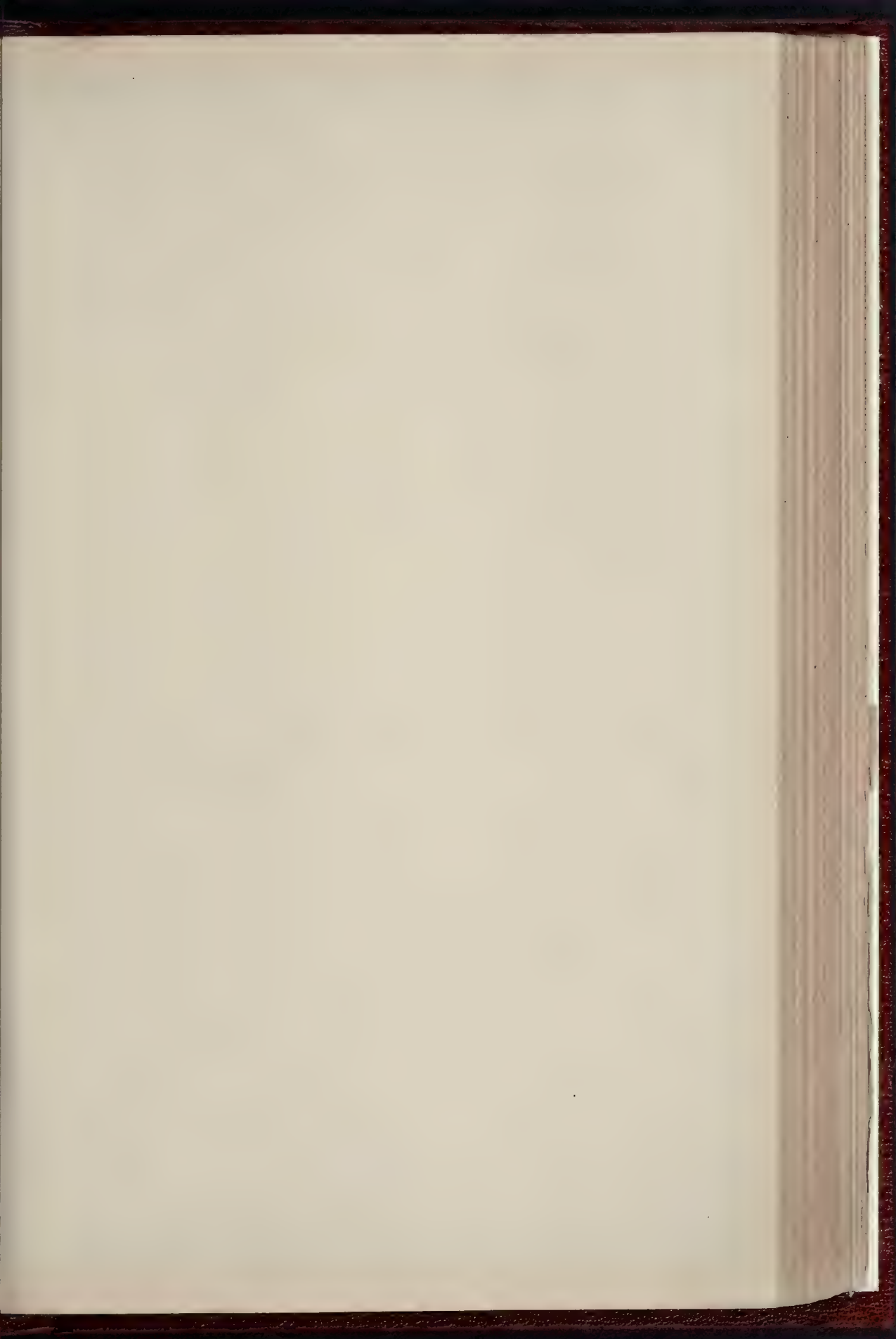
Illustrations.

CHURCH OF THE SACRED HEART, WIMBLEDON.

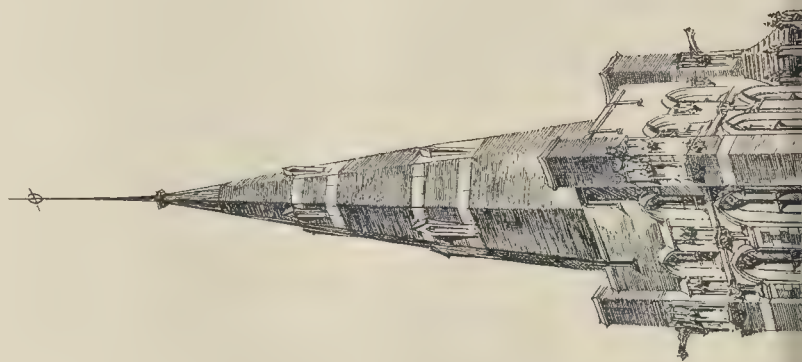
THE nave of this church was built some twelve years since, after which the work was suspended for a considerable time; it was, however, resumed within the last four years, and already the chancel, ambulatory, three apsidal chapels, and the south aisle have been completed, while the north aisle, baptistry, sacristies, &c., are now in course of erection.

The exterior of the whole is faced with knapped flints, with masonry and dressings of Ancaster stone. Internally, the whole of the work is in Beer stone. Up to the present time about 20,000 ft. has been expended, and portions now in progress will cost another 8,000 ft.

Mr. Frederick A. Walters, of Westminster, is the architect. The view shows the exterior of the chancel with the apsidal chapels.



THE BUILDER, APRIL 23, 1898





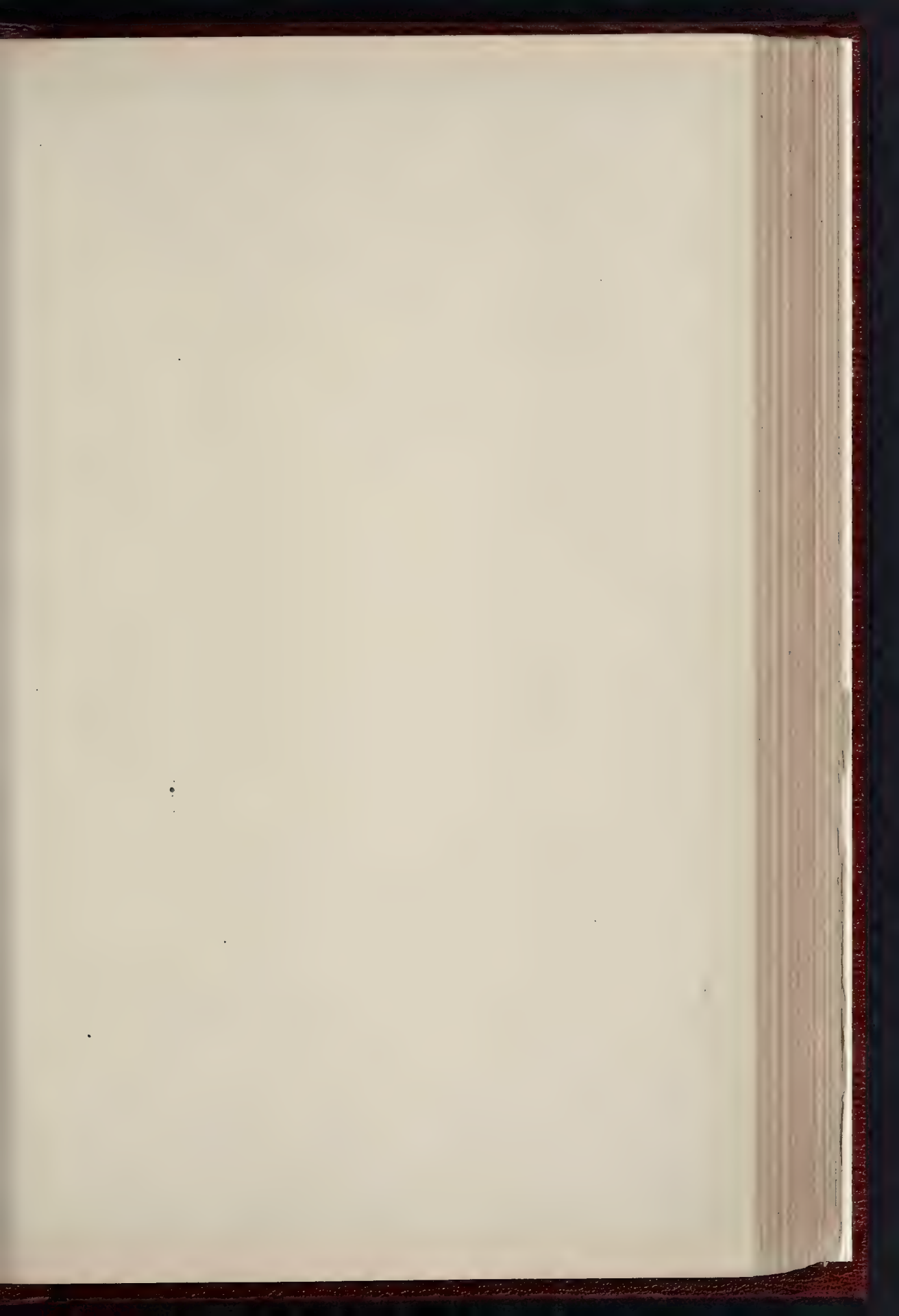
GRAYARD PRESBYTERIAN
CHURCH PUTNEY

BY J. C. MURRAY & C. E. VALENTINE
— JOINT ARCHITECTS —

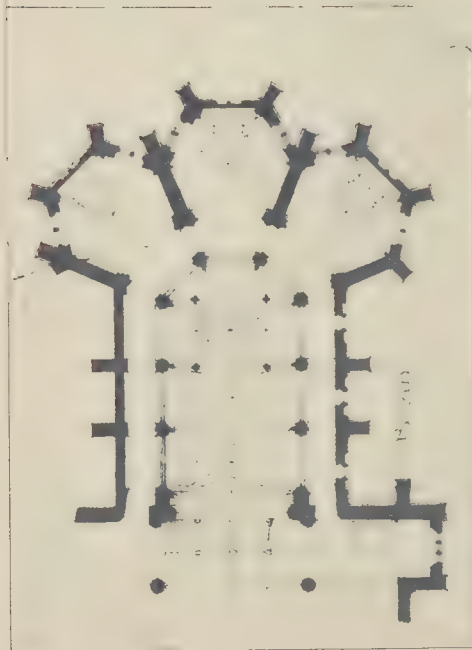
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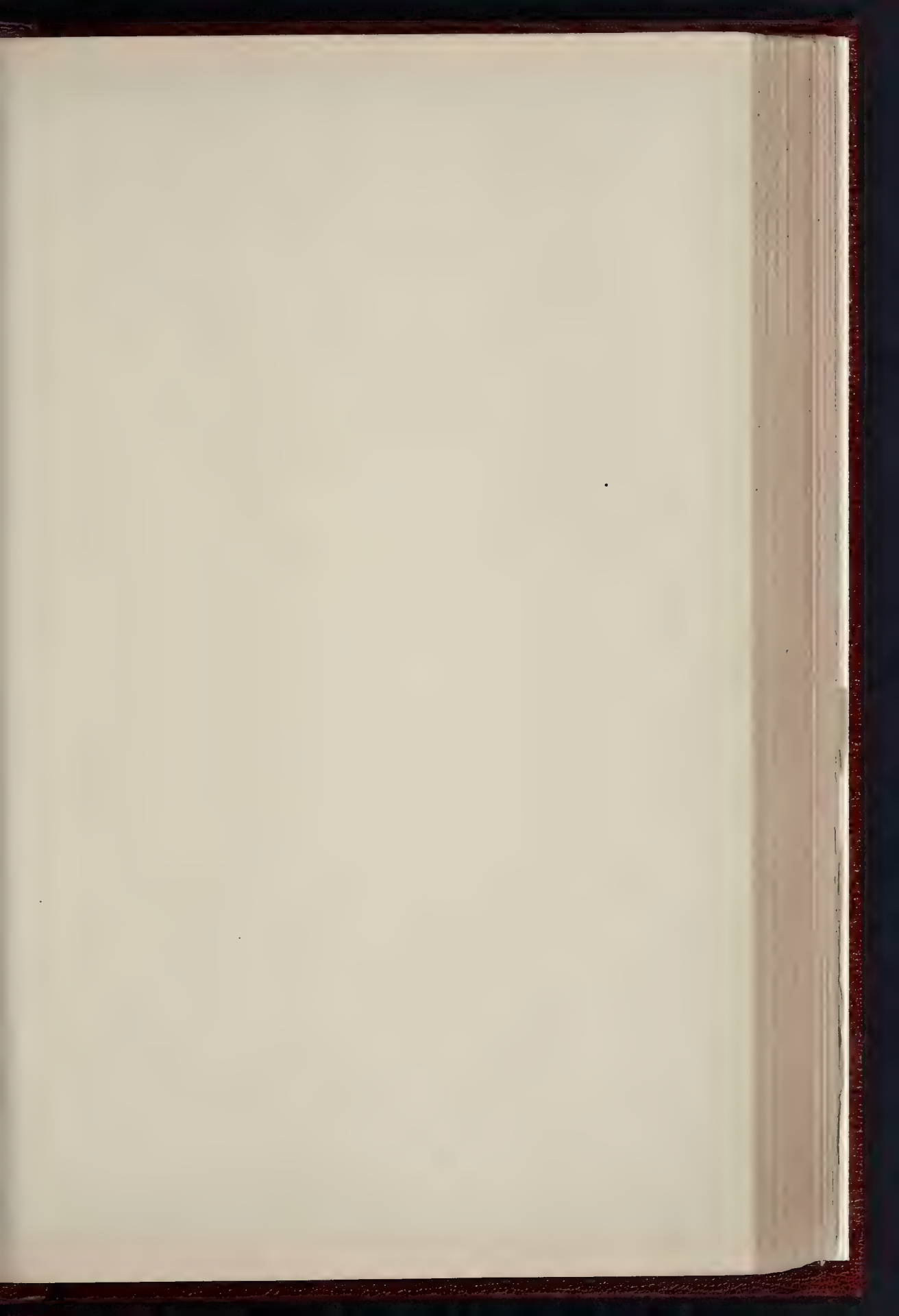
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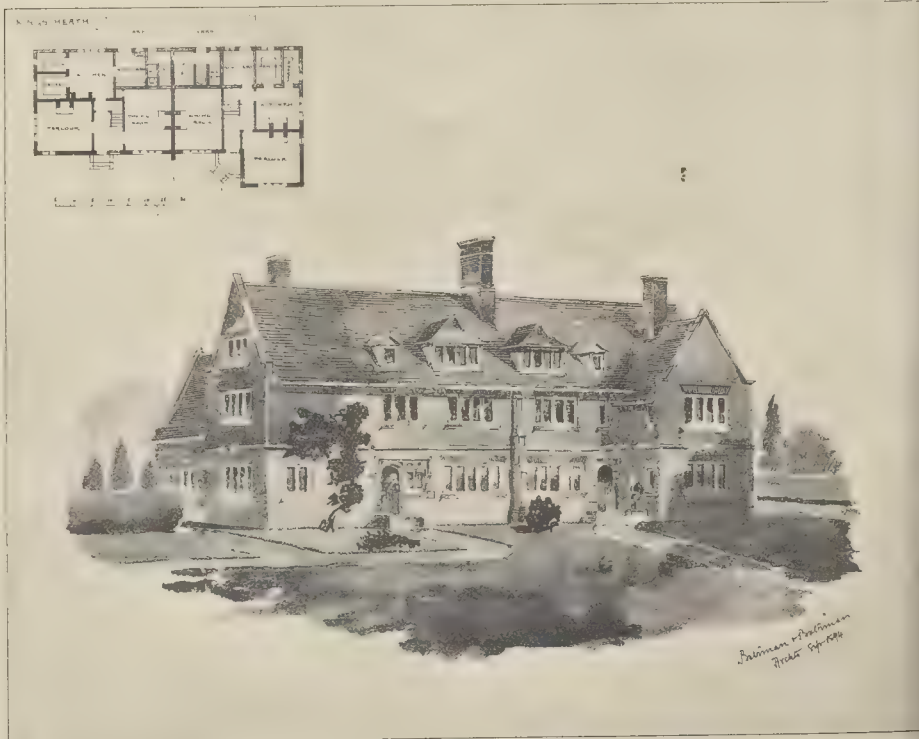
PHOTO 1 TWO SPRING, 8 A.M. - 4.45 EAST HARDING STREET, PUTNEY, LANE 17



THE BUILDER, APRIL 23, 1898.

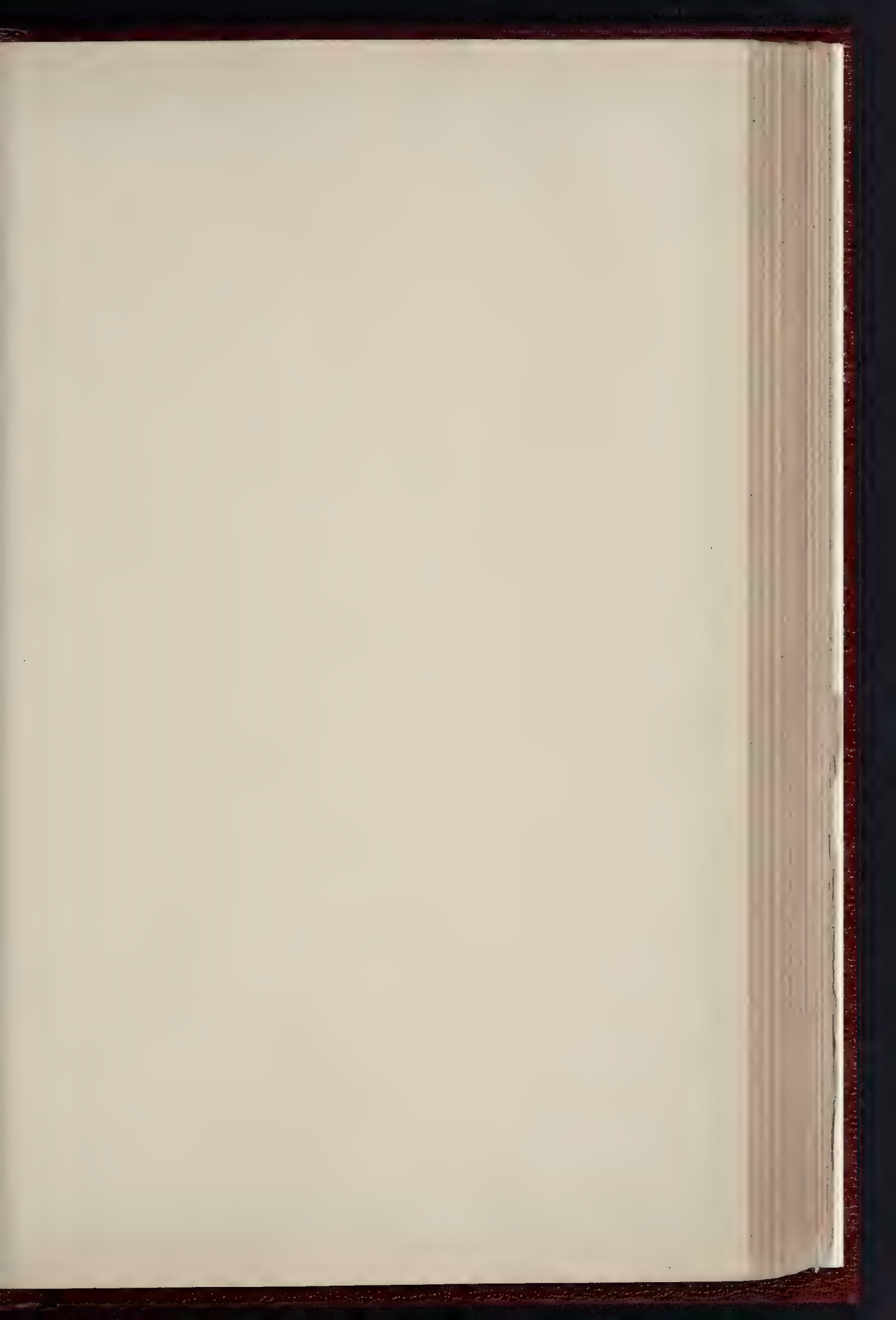




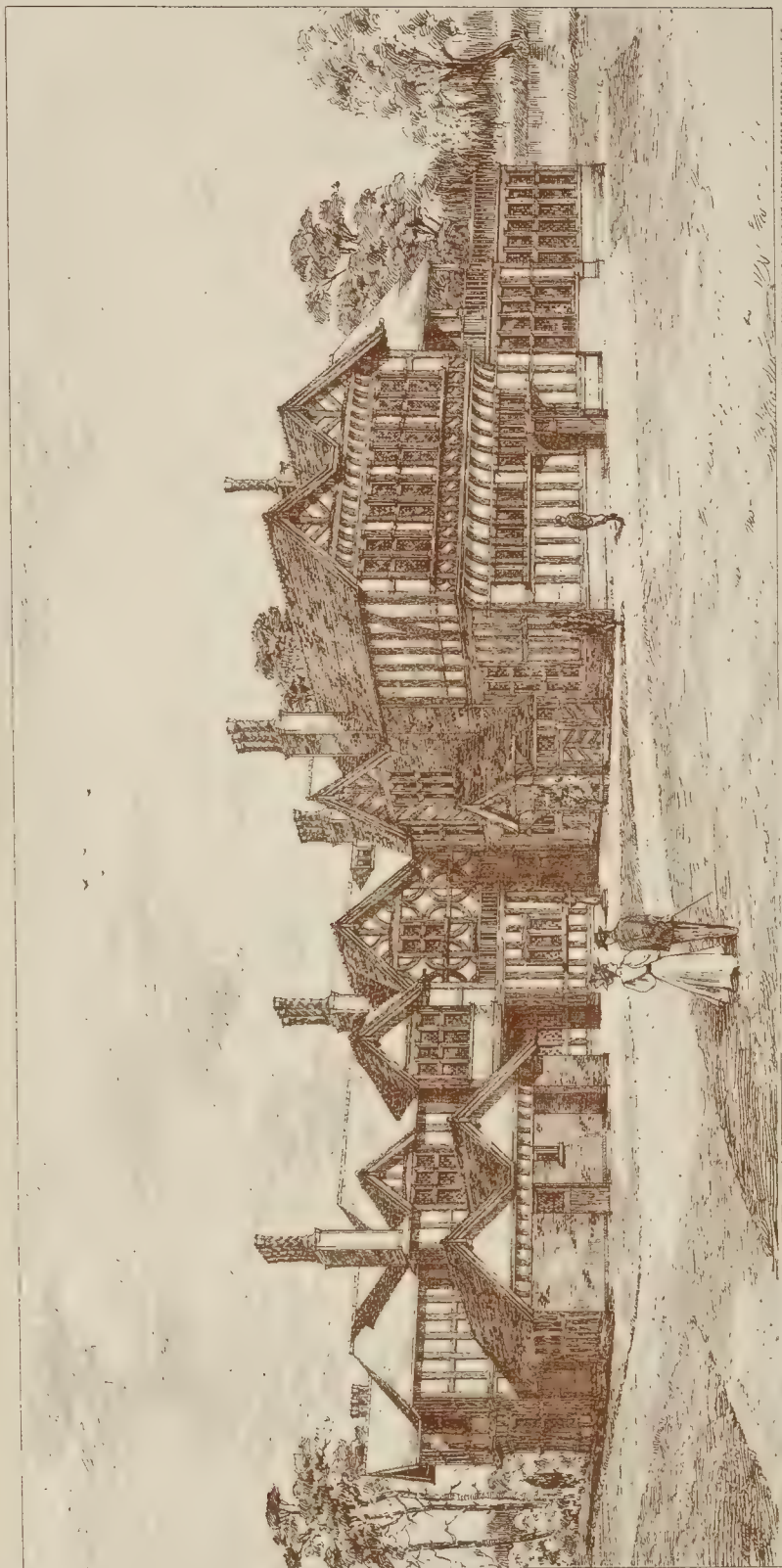


VIEW FROM VICARAGE ROAD, RIGHT HAND CORNER OF NEW ROAD.





THE BUILDER APRIL 23. 1898

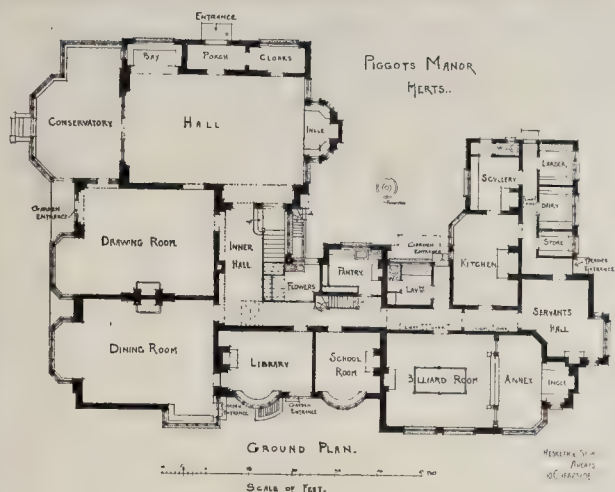


PHOTOGRAPH BY SPENCER & CO. 485 EAST HANING STREET LONDON, E.C.

PIGGOT'S MANOR, HERTFORDSHIRE.—MESSRS. HENKETH & STOKES, ARCHITECTS



LIVERPOOL ROYAL FREE SCHOOL, LIVERPOOL. ARCHT. MESSRS. HICKETH & SONS, ARCHT.



DESIGN FOR GRANARD PRESBYTERIAN CHURCH, PUTNEY.

This design, by Mr. J. C. T. Murray and Mr. C. E. Mallows, received the second premium in a competition for the above-named church.

The materials proposed for the construction were red brick and Douling stone, with green Westmoreland slating; the floors to be of solid wood blocks, and the internal woodwork stained and varnished.

The whole of the congregation was to be seated in the area, but provision is made for a future end gallery, if necessary. The hall and glass-rooms have been specially arranged for the convenience of Sunday-school work, and can be used separately or *en suite* as desired. The cost is estimated to be about 6,500.

The drawing was exhibited at the last Royal Academy.

"PIGGOT'S MANOR," HERTS.

THE house, as shown in accompanying plan and sketches, has just been completed, replacing the old plain stucco Manor House, and is carried out in timber framing and plaster, with red brick dressings where visible, from the designs of Messrs. Hesketh & Stokes.

The whole of the half timber throughout is worked in the solid in English oak, and built into the brickwork.

The house is almost entirely new, only a small portion in the centre of the original Manor House remaining (viz., library, school-room, and passage), and has been planned to work in with the old portions, the whole being related to harmonise with the new work.

The first floor throughout is constructed in steel and concrete. The joinery and finishings on the ground floor are carried out in wainscot, with enriched plaster ceilings in the billiard and drawing rooms, executed by Messrs. Jackson. The contractors for the general work were Messrs. Webster & Cannon, of Aylesbury, the sanitary work being carried out by Mr. Geo. Jennings, of Lambeth.

The drawing was exhibited at the last Royal Academy.

SUBURBAN HOUSES, BIRMINGHAM.

THESE small houses have been erected with local materials in an inexpensive way to meet the requirements of tenants who wish to have a small comfortable home at a moderate rent. 17 ft. by 13 ft. have been taken as a basis for the size of the sitting-rooms, with five bedrooms over them, and the kitchens, pantries, &c., with a lavatory, baths, and inside water-closet.

Messrs. Bateman & Bateman, of Birmingham, are the architects.

KING'S COLLEGE, LONDON.—The annual dinner of old students of King's College, London, will be held at the Holborn Restaurant, on Monday, June 13. The Bishop of London will take the chair.

THE SURVEYORS' INSTITUTION: MEETING IN MANCHESTER.

A MEETING of this Institution was held on Wednesday, at Manchester, in the Mayor's Parlour at the Town Hall, the members being welcomed by the Reception Committee, headed by Mr. John Holden, the Provincial Chairman of the District.

After the reception the proceedings were opened with a few remarks from Mr. Robert Vigers, Vice-President, who occupied the Chair in the absence, through ill-health, of the President, Mr. Christopher Oakley. As most of them would be aware, he said, that was the first time that the Institution had held a meeting in the provinces, and Manchester had been chosen because it had more members of the Institution than any other provincial town. It gave him and the Council of the Institution much pleasure to meet their Manchester friends. The Institution had been at work for upwards of thirty years, and as he had been a member from the first, he was able to speak from personal experience of the very great good to the profession that the Institution had been—and not only to the profession, but also to landowners and those interested in landed property. If the members of the Institution held together in the future as they had done in the past, their Institution must continue to be of very great service to them.

The Chairman then called upon Mr. John Holden to read a paper entitled "Manchester—1847 to 1897." The paper contained a great deal of historical and statistical information, a good deal of which however, may be said to have been rather of local than of general interest. We extract however the following passage giving a sketch of the general change of character and aspect of the town since 1847:

"Practically speaking, Manchester and Salford *per se* were contained within a circle of about one mile radius, of which the centre was placed in the centre of the present infirmary building. This circular patch (referring to a plan), which is shown by the thick dotted line, covered Manchester proper. Of course, roads and streets radiated from it in all directions, giving access to the out districts, and to the surrounding towns, and many districts, although not covered with buildings were projected or laid out, but building operations had not been seriously commenced. In some instances the connexion of the main roads with the town itself was very tortuous, as, for instance, the Bury old road, now called the Cheetham Hill-road, which is now a clear road from Albert-square, along Cross-street, Corporation, Ducie Bridge, and Cheetham Hill-road to Bury. At the time I mention the road for coaches and general traffic passed along Cateaton-street, Hanging Ditch, then wound along Todd-street, or Todd-lane, Long Millgate, to Miller's-lane, along which it turned to the left, and then over old Ducie Bridge into

York-street, and so on. Deansgate was very narrow, and along the upper part, that is, beyond John Dalton-street, was filled with what may be called hand-to-mouth shops, which catered for the large and poor population at each side, the greatest part of which is now swept away. Piccadilly and London-road was equally inconvenient. Commencing at the Infirmary Pond, or *Daub-holes*, as it was called, not the sweetest place in the world, and continuing past Booth-street, close to which the houses projected at right angles, about one-half way across the present street, then dipping down towards Granby-row, the same applies to other streets in the town. I will, however, describe the town itself as it existed in or about the year first named, or 1847. Many of the streets were narrow and crooked, and the access from one street to another was by no means convenient. It would hardly be possible, within the limits of a paper such as this, to describe the improvements which have been made by the authorities from time to time in seemingly small matters, such as rounding off corners, widening narrow necks, and cutting through from one street to another a few yards only, but which has had the effect of allowing traffic to pass easily from one street to another without going round considerable distances. The streets were paved generally with cobble stones, very imperfectly set and punned with a rammer. Some of the principal streets were paved with large square sets laid in cinders and filled in at the joints with the same material. Of course, the wet passed through and softened the bed, and the mud was something of which the present generation have no idea. The footpaths, where flagged, were very uneven, and in many places were protected by iron posts at the corners of the streets. Buildings were beginning to be replaced with others more in accordance with the times, but great numbers remained as they existed at the end of the last century. Some few of the old warehouses may still be found in Cannon-street, and in the streets right and left. This was at that time one of the principal streets for warehouses, and the old buildings will readily be recognised by their low stories, long windows of comparatively small height, and plain brick fronts. Many of the houses, at that time used for residential purposes, had the large room on the top story with the window extending along the front, at which the old hand looms used to be placed. Similar rooms are still found in the out districts where fustian cutting is carried on. This Cannon-street district has been left behind to a great extent, but is now on the eve of reconstruction. The old half-timbered houses, so beloved by artists and others, were plentiful, but are gradually being removed. The great removal occurred in 1822, when Market-street was widened. Long Millgate was full of them, also about Deansgate and Red Bank, and some few specimens existed at Smithy door, notably the Vintners' Arms, and the building afterwards called Corylon's Bank; these were removed about 1873, for the widening of Deansgate. Several also are in Shudehill and Withy Grove, in particular the Seven Stars public house, said to be one of the oldest licensed houses in the country, and the Rover's Return public house. Also houses in Greengate, Salford; and the Wellington Inn, Market Place, and Old Shambles, Manchester, both licensed houses. A number of these houses were demolished a few years since at a place called Gibraltar, near Scotland Bridge, to make way for extensions of the Lancashire and Yorkshire Railway."

Mr. J. Cross, in proposing a vote of thanks, referring at some length to the rateable value of Manchester and Salford, said that the figures given by the lecturer related really to the parish of Manchester, which was comparatively a small portion of the present city.

Col. Bridgford, in seconding the vote of thanks, said that the prices given by Mr. Holden were rather under the prices at the present time.

The vote of thanks having been carried and Mr. Holden having briefly replied,

Mr. C. P. Hall read a paper entitled "A Consideration of some of the Present-day Difficulties met with in a Land Agent's Practice." In the course of his remarks he referred to the question of rent reduction, the supply of labour and allotments. In regard to new buildings and holdings, he said that a great deal of consideration was necessary before yielding to the requests of tenants for

them. A tenant invariably asked for the provision of certain holdings to suit his own particular fancies, and frequently, after the expenditure of considerable sums of money, the tenancy proved short and the successor adopted quite different methods, for which the new buildings were worse than useless. Unless, therefore, there was a real necessity for such buildings for the proper management of the holding, an owner would be well advised in declining to incur the outlay. Further, it was often desirable to withhold consent to the tenant doing the work himself, unless in the case of temporary structures, which he should agree to remove on the expiration of the tenancy. The dual interest in the holding created by the erection of buildings by the tenant was wrong in principle, and the owner was probably compelled sooner or later, by the termination of the tenancy, to acquire jerry-built premises, costly to repair and of small credit to the landlord when he owned them. It was different with repairs. When a holding was equipped with substantial and convenient buildings every effort should be made to keep them up, even if the present altered conditions of agriculture (such as the conversion of arable to pasture) should render them unnecessary in their present form. Estate repairs was a heavy item, but it was wiser to keep up buildings on which large capital had already been sunk than, by neglect, to allow them to become ruinous, when no one could tell how soon they might be required again. The most satisfactory method of carrying out repairs on a large estate was by the employment of workmen direct, provided there was sufficient supervision. It was cheaper, and the work was more thoroughly done than by the employment of a contractor. In the case of entirely new work of any magnitude, he thought the contract system preferable. The author then dealt with the repair of fences, the game question, and trespass.

On the motion of Mr. Bidwell, seconded by Mr. J. W. Fair, a vote of thanks was accorded to the lecturer.

After a short adjournment for luncheon, a paper was read by Mr. Thomas Blashill, entitled "Lessons from Fire and Panic," which, with the exception of one or two introductory sentences, we print in full on another page.

In the discussion which followed

Mr. Richards, M.P., in moving a vote of thanks to Mr. Blashill, said there was an urgent necessity for non-inflammable floors. In the fire in Tabernacle-street nearly all the new buildings, which were provided with what were called fire-proof floors, collapsed in a very short time. In regard to the requirements of the London County Council, he had nothing but praise for the determined efforts they had made to prevent places of amusement becoming places of sudden death. London had had many authorities, and he was afraid it was not perfect yet. Mr. Blashill, one of the most conscientious officers in London, had a very difficult task to perform. Those who remembered the discussion in committee on the London Building Act and the evidence which was given, were made conscious of the difficulty of enforcing modern views as to narrow streets, crowded areas, &c. He would have liked to have heard a few more definite remarks from Mr. Blashill as to the exits from churches and chapels. He (the speaker) knew of many such buildings, where, in the event of a panic, the results would be most disastrous. He thought it would be advisable for the County Council to occasionally inspect these buildings, and also to look after the way chairs were placed in places of worship.

Mr. H. H. Collins seconded the vote of thanks, and referred to the changing character of the County Council requirements. Even in regard to theatres there was no finality as to the requirements, and the Council put a manager of a theatre to a great deal of expense, and, shortly after, the expenditure was found to be in a large measure useless, and something more was demanded. The paper contained so much that needed reflection, and so many points that might be very usefully discussed at length that he suggested its full discussion be adjourned until the Institution next met in London.

Mr. Holden said that fire arrangements should be made as simple as possible, and in such a way as not to be interfered with or neglected. He thought a continuous balcony a very good provision for escape from fire in houses. Iron was one of the worst materials

to use in buildings where there were fire risks, for, as joists, it bent and twisted, whereas oak beams did not.

Mr. Hartley, of Liverpool, supported the vote of thanks, and said that he had often found that where provision had been made for all kinds of appliances for the extinction of fire they could not be used at the time they were needed most. The question of exit was a most important one, and he was glad that Mr. Blashill had referred to exits in connexion with churches and chapels, as well as in places of amusement. He knew of a church which could accommodate 1,200 people where there were two small doors, both of which opened inwards. It was very necessary that people should be protected in places of worship as well as in other buildings. He quite agreed that decorations in churches were very often a great danger. He was quite in accord with Mr. Blashill as to balconies, but he would restrict them to the upper floors—that was, floors which could not be reached by a short ladder, or easily from the ground—so as not to encourage burglars.

Mr. H. S. Payne said that dry rot would be likely to result if floors were made too air proof. One merit of the jerry builder's methods was that dry rot was not discoverable in the buildings they erected. It might be information to some of his hearers if he mentioned that on board the American liners the crew regularly took part in fire drill, and he thought that the County Council should require a fire drill amongst assistants in theatres.

Mr. Howard Martin said that he could give an instance of the effect of fire upon iron construction in floors. In the Cripplegate fire, the warehouses in a row of ten were new, with fireproof floors, and the other was an old building, with wood floors. The iron in the fireproof buildings buckled and wrecked the walls of the buildings, whereas in the case of the old building the walls stood perfectly well.

The vote of thanks to Mr. Blashill having been unanimously agreed to, the further discussion of the paper was adjourned.

A vote of thanks to the Chairman was proposed by Mr. Holden, and seconded by Mr. Wainwright, and carried, and the meeting separated.

A paper entitled "Notes on the Construction of Town Buildings," by Mr. Howard Chatfield Clarke, was taken as read. We shall print it next week, together with a report of the dinner which took place in the evening at the Grand Hotel.

On Thursday the following visits were made:—To the City of Chester and Eaton Hall; the Manchester Ship Canal; the London and North-Western Railway works at Crewe; and Egerton Cotton Mills, and the Corporation Sewage Farm.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION. At a meeting of the Edinburgh Architectural Association in the Royal Institution on the 6th inst., Mr. Thomas Ross, the President, in the chair, Bailie Pollard, Convenor of the Town Council's Public Health Committee, gave an address on "Fever Hospital Structure, with special reference to the new City Hospital at Colinton Mains." Having given a brief sketch of the history of the development of isolation hospitals, the lecturer said that it was only in recent years that local authorities throughout Great Britain had been aroused by public opinion and legislation, so that infectious hospitals were now becoming general all over the country. He proceeded to show that the prime consideration for the architect of a fever hospital must be to make his structure an instrument of healing. External appearance was not to be despised, but the internal arrangements must receive closest study and most minute care. With reference to situation, he remarked that well-regulated fever hospitals might exist even in populous centres without detriment to the community. When the choice of a site was in view, many reasons showed that the hospital was best at a distance from other dwellings, not so much for fear of spreading disease as for the sake of the institution itself. The size was relative to the population of the community to be served. Differing from Dr. Thorne, of the Local Government Board, who suggested hospital provision for one per 1,000 of the inhabitants, the lecturer advocated larger hospital accommodation, and, upon experience of Edinburgh, was prepared to maintain that provision should be made for one in every 600. Materials of the structure

might be pasteboard, canvas, wood, brick, or stone. Stone was preferred in Scotland. The laying out and arrangement of buildings was dwelt upon, and it was shown how needful it was that the different diseases should be classified, and cross infection guarded against; while the different parts of the whole structure should be so placed as to secure greatest convenience of access between the sick rooms and the administrative, culinary, and other departments. Drainage, ventilation, and heating were then described as elements of essential importance, the requisite amount of floor space and air space per bed being also alluded to. The laying out of wards and of ward accessories, baths, and lavatories was next discussed. Dwellings for the doctors, nurses, ward attendants, and servants were described, and the most suitable arrangements for kitchen, laundry, and other services were dealt with. After setting forth the main objects to be sought in a completely efficient modern hospital, Bailie Pollard proceeded to show how these were likely to be obtained in the new city hospital at Colinton Mains. He exhibited by means of the limelight a series of views from the plans prepared by Mr. Robert Morham, City Architect. He directed special attention to the situation of the hospital, with its southern exposure and uninterrupted sunlight, alike during winter and summer. Particular mention was also made of the large provision of sun rooms for patients during convalescence. In conclusion, he observed that, only second to its use as a healing institution, the hospital should afford a training school for nurses, and an important place of medical instruction.

BRISTOL SOCIETY OF ARCHITECTS.—The annual general meeting of this Society was held at the Fine Arts Academy, Queen's-road, on Monday last, Mr. F. W. Wills in the chair. The President, Mr. W. L. Bernard, F.R.I.B.A., and Vice-Presidents, Messrs. Joseph Wood and W. V. Gough, were re-elected, and a vote of thanks was accorded to the retiring Hon. Sec., Mr. W. S. Skinner. Mr. H. Dare Bryan was elected Hon. Sec. for the ensuing session.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual report of this Association records a continued increase in numbers, the Association now including 145 members. The report records, among other incidents of the past session, the presentation by Mr. Glover, the Vice-President, of an insignia or badge to be worn by the President for the time being, which was designed by Mr. W. S. Hicks, and executed by the Goldsmith's Company.

LIVERPOOL ARCHITECTURAL SOCIETY.—A dinner was held on Monday, the 18th inst., in the Walker Art Gallery, to commemorate the fiftieth anniversary of the founding of the Society. The President, Mr. W. E. Willink, was in the chair, and among the invited guests were Mr. E. W. Mountford, representing the Institute of Architects; Mr. Hampden W. Pratt, President of the Architectural Association; Mr. John Ely, President of the Manchester Architectural Society; Mr. George Corsin, President of the Leeds Society; and Mr. C. E. Bateman, President of the Birmingham Society. After the toast of "The Queen," Professor Simpson proposed "The Royal Institute of British Architects and the Architectural Association." He said that a great deal of good work was done by both societies; that the Institute by the prizes they gave annually assisted greatly many young architects, and that among the list of the prize winners of fifteen or twenty years ago could be seen the names of many of the best architects of the present day. But the great friend of the student, he said, was the Association. It was the pioneer of architectural education in England, and for many years did most excellent work unaided. Mr. Mountford, in reply, said that the Royal Institute did deserve well from the architects of the country. They got through an enormous amount of work on behalf of the profession at large, and by which it benefited. Whatever might be thought of examinations, there could be no doubt whatever that examinations had been productive of good results. Men who had been "relegated" tried again, and did very much better. Liverpool was to be congratulated upon the existence of its School of Architecture and Applied Arts, and upon having the management of that school in the hands of such men as Professor Simpson, Mr. Allen, and Mr. Anning Bell. Mr. Hampden Pratt, responding for the Architectural Association, said it might be stated

with perfect truth that the architects of the present and the architects of the future were for the greater part those who had passed, or would pass, through the ranks of the Architectural Association. At the present time, when they were being, as it were, assailed by boards of technical education, which were to some extent their competitors and rivals, they endeavoured, as an Association, to hold their own, and they did so on the ground that however competent these technical boards and classes and institutes might be, they could not and never would take the position that the Architectural Association had been able to and still could take in regard to the profession. Mr. Hartley proposed the toast of "The Allied Societies." He said that the allied societies might have benefited by their connexion with the Institute, but the Institute had no doubt been benefited by having connected with it the allied societies. In the course of this speech they might look forward to better days, when advanced education would be better understood, and when some systematic action would be taken by provincial societies, such as they had taken in Liverpool, that would benefit the coming generation of architects. Mr. John Ely acknowledged the toast, which, he said, embraced fifteen societies, with a membership of something like 1,000. He congratulated the Liverpool Society upon the attainment of the fiftieth year of its existence. Mr. T. D. Barry gave "The Liverpool Architectural Society." He said he was the only living instance of the first committee of the society. He presided over the "silver wedding," and he was now privileged to propose the toast of its fiftieth anniversary. The Chairman, in replying, thanked their thanks to those who had permitted the Society to hold its jubilee dinner in that gallery, where they were able to appreciate the great strides made in recent years towards the attainment of art and applied art which they so much desired. The succeeding toasts were those of "The Guests" and "The President."

COMPETITIONS.

PENRITH COTTAGE HOSPITAL.—A competition has just been decided for the erection of a cottage hospital at Penrith. Messrs. G. Watson & Son, Penrith; Mr. G. D. Oliver, Carlisle; and Mr. Martindale, Carlisle, were invited to compete, and the plans sent in by these gentlemen were considered at a meeting recently, and those marked "Fitness" were selected. These plans were found to be by Messrs. G. Watson & Son, and they were appointed architects to carry out the work.

SCHOOLS AT WEST CARRON, STIRLING.—Some time ago Larbert Parish School Board agreed to take in six competitive plans for the new school proposed to be erected at West Carron. It was arranged to ask two plans from Falkirk architects, two from architects in Stirling, and two from Glasgow architects, and to send the plans to an Edinburgh architect for a report and recommendation as to which he thought should be adopted. A meeting of the Board has been held to consider the report, when it was found that the Edinburgh architect gave the opinion that the plans of Messrs. M'Luckie & Walker, Stirling, stood first in order of merit; those of Mr. Jas. Strang, Falkirk, second; while the plans of Mr. Simpson, architect, Stirling, ranked third in the list. It was agreed to adopt the plans of Messrs. M'Luckie & Walker. The school to be built is to accommodate 650 children, at a cost of 6,700*l.*—*Falkirk Herald.*

ENGINEERING SOCIETIES.

THE CIVIL AND MECHANICAL ENGINEERS SOCIETY.—A meeting of the above society was held at the Hotel Victoria, Charing Cross, on Thursday, April 14, 1898, Mr. B. S. Duddle, vice-President, in the chair. A paper was read on "Pipes and Pipe Laying," by Mr. Alfred Hansen. The author first drew attention to the largeness of the subject, but that he would beg to limit the paper to cast-iron and stone-ware pipes, and drew attention that, to a great extent, the health of the town and country depended on the use of proper pipes, several specimens of pipes being exhibited,—amongst others, a large section of a cast-iron pipe, that had been made over a century ago. One of the most important points in pipe-laying was the proper jointing of two pipes, several methods being discussed, and also the various methods used in different countries. The next

important point was the depth of the pipes to protect them from the frost, and also the crushing weight by the passing of heavy carts over the mains and sewers.

THE LONDON BUILDING ACT, 1804.

TRIBUNAL OF APPEAL CASE.

The Tribunal of Appeal under the London Building Act, 1864, sat at the Arbitration Room of the Surveyors' Institution on Monday, to hear an appeal by the Lion Brewery Company, Limited (by their solicitors, Messrs. J. White & Leonard), against the decision of the London County Council contained in a resolution passed by that body on October 8, 1895, in relation to a building plan certified by the District Surveyor under Section 43 of the Act, subject to certain conditions in the matter of the proposed re-building of the "Nags' Head" public-house, No. 31, Foubert's-place, Regent-street, under the provisions of Section 43 of the Act. The members of the Tribunal sitting were: Arthur B. Hudson, chairman, Mr. J. H. Fenfold, and Mr. J. H. Hudson. Messrs. A. F. Wooten, Garriety, and J. H. Fenfold appeared for the appellants, and Mr. Senger Berrie for the County Council.

Mr. Wootton, in opening the case for the appellants, said the property in question was situate upon a street formed or laid out before the passing of the Act. The sub-section 2 of Section 43 of the London Building Act, 1894, under which the appellants made their application, provided for erecting the intended domestic building shall desire to deviate in any respect from the plan or plans certified by the district surveyor, it shall be lawful for him to apply to the Council, who shall sanction such deviation, if they are satisfied that he may think fit, provided that such conditions shall not in any case be more onerous than the conditions prescribed for domestic buildings erected after the commencement of this Act, abutting on a street formed or laid out before that date. Mr. Wootton said that the appellants may think fit, provided that such conditions shall not in any case be more onerous than the conditions prescribed for domestic buildings erected after the commencement of this Act, abutting on a street formed or laid out before that date.

The Council said that the appellants had definitely, viz., that the County Council shall sanction such deviation. On January 10, 1898, application was duly made for permission to deviate from the old plan. On February 28, his clients' architects (Messrs. Goodwin & Sons) received notice from the Council that the Council would not assent to the proposed deviation. (See p. 76, Blashill) that sanction had been given subject

The following conditions:—“That the provisions of Section 47 of the Act with respect to the open space and height of the new building at the rear be complied with in the rebuilding; and that the said new building be of a smaller height than the existing building; and that the application be made in writing with the letter of application.” The appellants on receipt of this letter consulted Messrs. White & Leonard, who wrote the Council's Architect to the effect that they thought there must be some misapprehension as to the facts, as no more land was proposed to be occupied by the new building than was occupied by the existing building. The Council, in fact, the occupied land would be slightly less, and the air space equal to the old conditions. Replying to this, the superintending architect wrote that the discretionary power conferred on the Council by Section 43 to sanction deviations was limited to cases in which no more land was to be occupied by the new building than was occupied by the existing building. The letter continued, that as on rebuilding No. 20, Foubert's place it was proposed to leave an area in the rear of less extent than that which formerly existed, the Council could not under the provisions of Section 43 entertain the application for permission to do so. In proposing, Mr. Leonard stated that the conditions of the letter of sanction made by the Council were bad in law. First of all because they amounted in fact to a refusal to sanction the deviations, though the Act was imperative and said the Council “shall” sanction. His second point in law was that the conditions were more onerous than the Act required, and that he was of opinion that they were uncertain and indefinite, and, therefore, unreasonable, and not made with proper exercise of discretion. For the purposes of his argument, he assumed that the provisions the County Council wished to impose were contained in Part II. of Section 47 of the Act, and that the substance of the conditions was that the new building was to be of a smaller height than the existing building, and that the open space extending throughout the width of the building to a depth of at least 10 ft., and that the diagonal line must start from that level. On looking at the sectional plan, it would be seen that it was impossible, if the section was complied with, that the building could be of a smaller height than the existing building, because the building would have to be set back to a line which utterly destroyed the value of the sanction. It was not necessary for him to demonstrate in fact that the conditions made the sanction nugatory, because the Council, by their architect's letter, had already admitted that such was the intention, and it was in view of this that they could deal with plans of which they disapproved was to make them nugatory by means of conditions. He contended that the conditions imposed by the Council in this case could not really apply, as the building was situated on a corner, and that the conditions were not intended to be applied. He contended that if in such a case the Council prescribed the conditions of Section 47, sub-Section

then they made their sanction no sanction at all, because the owner of the building could have built in compliance with that Section without going to the Council at all. As to his second point in law he assumed that they would have to comply with conditions which were more onerous than permitted by the Act. As to his last point, that of the uncertainty and indefiniteness of the conditions, he said that they would get all that the Council wanted in the plans. Then they took the provisions of Section 41 to be complied with. Taking those facts together the one part was utterly inconsistent with the other, for they could not both comply with the plans and also with Section 41. It was quite clear to him that the conditions in question had been hurried arbitrarily at his clients, and without due consideration of the nature of the case by the Council. He asked the Tribunal in its discretion to relieve his clients from all or part of the conditions the Council had laid down.

Mr. Leonard William Goodwin, architect of the building in question, gave evidence in support of counsel's statement, and said that the total increase of air space which would be obtained by the deviations was 254 cubic feet 6 in.

By the Chairman: The proposed first floor would occupy a certain amount of air space which was at present open. The area of air space provided by the old plans was 123 square feet, but that which would be provided by the proposed deviations would be 61 ft.

The Chairman pointed out that by the Act of 1855 an air space of 100 ft. had to be provided, and by the Amendment Act of 1882 200 ft. had to be provided, so that the appellants were asking for permission to provide less air space than was even allowed by the Act of 1882.

Mr. Senger, replying to the arguments of Mr. Wootton, said he thought they could be met by one simple explanation. It appeared that the application for deviation was not intended to apply to a deviation as to height, but the County Council had been labouring under the impression that it did. What Mr. Senger said in respect of the height of the pylons they objected to, was the coming up of existing air space. They had no objection to an extra story to the building, but they declined to allow existing air space to be encroached upon. The appellants were really asking to be allowed to do a thing which was not permitted by law. Their only reason seemed to be that they wanted to put up a better public-house and do a better trade. That was a very natural wish, but they could not do so at the expense of their neighbours. He therefore asked the Tribunal to dismiss the appeal.

After a consultation between the parties, with the guidance of the Tribunal, Mr. Wooten suggested the following as a compromise upon which the Tribunal might base their decision:—To remove altogether the building on the east side above the first-floor level, to provide there an open area of not less than 130 ft. superficial, and on the remaining space in the rear of main building to erect a building not exceeding in height to the eaves of the roof thereof 24 ft. above the level of the pavement, and not exceeding the diagonal line of $63\frac{1}{2}$ degrees.

Mr. Berry said he should be prepared to accept this proposal.

The Chairman then intimated that the Tribunal would allow the appeal, and decide that re-building might proceed subject to the conditions agreed to. Mr. Wootten asked for the costs of the appeal.

After further argument, the Tribunal agreed to consider the question.

BOOKS RECEIVED.

THE BOOK OF GLASGOW CATHEDRAL. Edited by George Eyre-Todd. (Glasgow: Morrison Bros.)
THE CATHEDRAL CHURCH OF HEREFORD. By A. Hugh Fisher. (Geo. Bell & Sons.)

Correspondence.

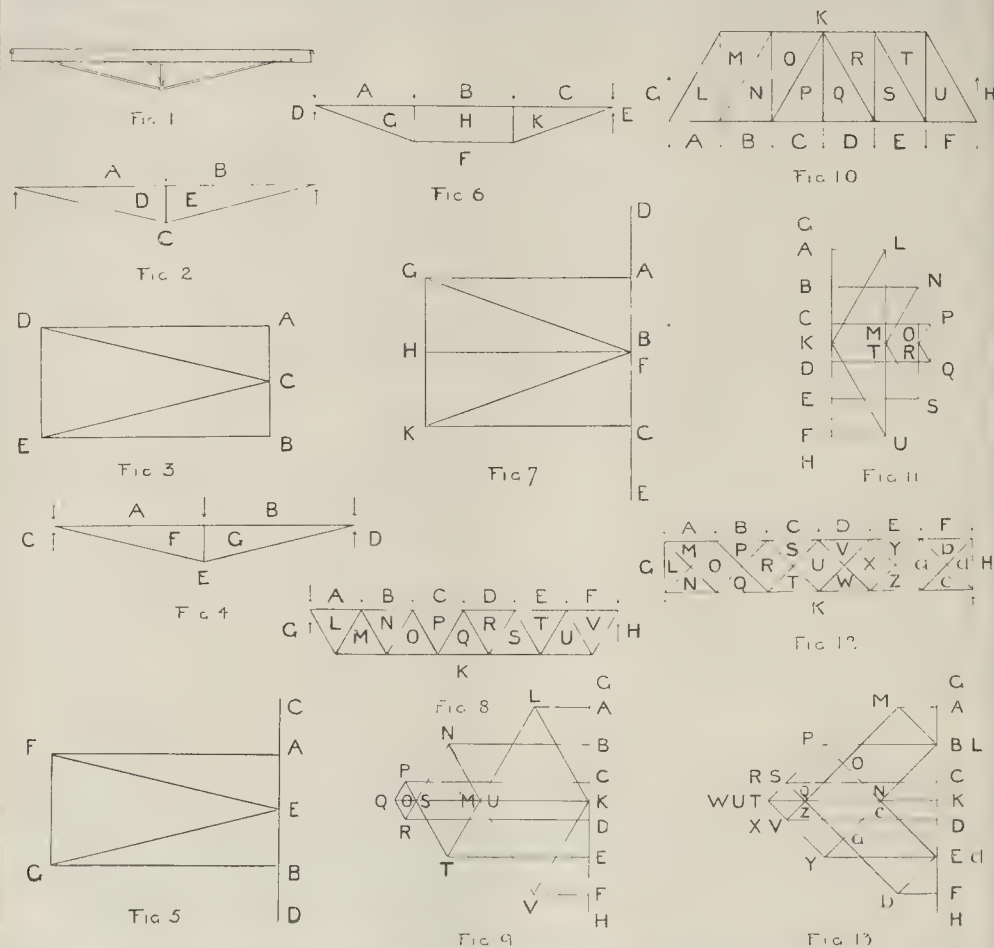
To the Editor of THE BUILDER.

THE "WARRANT" DESIGN FOR ST. PAUL'S.

SIR,—In your criticism on my History of Renaissance Architecture (*the Builder*, April 16, 1898) you say: "Mr. Blomfield endeavours to suggest that Wren could never have seriously intended this" (the warrant design for St. Paul's "with the gigantic peddle on the top of the cupola") "that it was a design made to catch the vulgar eye, with the intention of eluding it afterwards." May I point out that on pages 167-68 of my book I have expressly said that Wren "probably designed it in all good faith in the first instance, and that he did so may be taken as further evidence that the faults and inferior technique of Wren's earlier work were the result of inadequate training."

REGINALD BLOMFIELD.

* * On referring to the book, we find that we did inadvertently attribute to Mr. Blomfield an opinion which he had in fact mentioned as that of another writer.—ED.



"BEAUTY IN ENGINEERING DESIGN."

SIR.—Referring to the note in your issue of April 9, page 344, I think you will see from the short report published that I thoroughly disapproved of the introduction of added architectural embellishments in engineering design.

I am not prepared to suggest the motive that has prompted engineers to hide, by external ornament, often of a tawdry nature, the work they have reason to be proud of as examples of structural skill, but I presume that they pondered to what they believed public taste required; at the same time, this want of appreciation of the truly beautiful has not been confined to engineers, and architects have, in my opinion, not only been equally at fault, but have used the addition of architectural features to cover up defects in construction.

E. FUHRMANN CLARKE.

*** Mr. Clarke seems to have missed the real point of our Note. He said that engineering works were not to be improved by the addition of architectural ornament, and evidently implied that architects believed that they were. What we pointed out was that architects—those who were worth the name—would be the first to disclaim any such view.—ED.

ANCIENT SOUTHAMPTON.—A collection of drawings illustrative of ancient Southampton which has been made by Mr. William Burrough Hill, a surveyor who is a native of the town, is on view in the small hall, Philharmonic, Above Bar, Southampton. The collection is open free, and is exhibited solely with the view of interesting the public in these records of the history of the town, which include, it is said, many representations of old streets and houses that have now disappeared. We have not been able to visit the exhibition, but we entirely sympathise with its object and with the spirit in which it appears to be carried out.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XVI.

THE method of finding the amount of the stresses in a truss by means of the reciprocal diagram of forces can be applied as readily to any form of girder which is made up of trusses as to the examples of roofs which we have given.

Let us first take as an example a simple form of wood girder trussed with a cast-iron strut under the middle and a continuous wrought-iron tie-rod passing from end to end of the girder under the strut, as shown in fig. 1. We will suppose that the load on the girder is a single one concentrated immediately over the strut, then fig. 2 is our frame diagram with the known forces, which are the load and the two reactions of the supports, marked as before by arrows. Our spaces between these three forces we letter A, B, and C, and those between the parts of the truss, D and E. In fig. 3 we have our reciprocal diagram, in which we draw A B to represent the load, and A C and C B to scale the reactions, then C D and C E are drawn parallel to the lines of the tie-rod, and D E parallel to the vertical line of the strut. The lines in the reciprocal diagram represent to scale, therefore the stresses in the parts of the trussed beam to which they are parallel. Next let us suppose that the beam has a uniformly distributed load. The stresses in a truss we can find in a very similar manner to our last example, but it must be remembered that the beam must also be strong enough as a

beam to carry its distributed load over the spans between the points of support which are the strut and the supports, whether walls or otherwise, at the ends of the beam. Our reciprocal diagram gives us the stresses in the truss. In fig. 4 we have our frame diagram with, as usual, arrows showing the direction of the known forces, and the letters A, B, C, D, E, F, G for our spaces. Then in fig. 5, our reciprocal diagram, we draw C A, A B, B D to represent our loads, and C E, E D our reactions. Then E F, A F, E G, B G, and F G we draw parallel to the members of the truss, and consequently representing them in magnitude.

In fig. 6 we give the frame diagram, and in fig. 7 the reciprocal diagram of a timber girder similar to that we have been considering as shown in fig. 1, but with two struts instead of one. The method of procedure is the same as before. Having drawn our frame diagram and lettered the spaces, we draw in the reciprocal diagram, D A, A B, B C, C E, representing to scale the loads on the several points, and D F, F E (F happens to coincide with B) for the reactions. Then F G, A G, F K, C K, G H, B H, K H, parallel to the members of the truss hence representing in magnitude to scale the stresses in those members.

We will now extend our investigations to some of the most commonly used forms of iron and steel open web or trussed girders. Of these we will take those known as the Warren, the Whipple-Murphy, and the lattice girders as examples.

In fig. 8 we have the frame diagram of a Warren girder, with the load on the upper flange. The problem and the method of solution is as easy as our last. By arrows down-

and we indicate the direction of the loads at various points, by arrows upward the reactions of the supports. We letter the spaces between the directions of the forces and external the truss, A, B, C, D, E, F, G, H, K, and the space between the parts of the truss L, M, N, P, Q, R, S, T, U, V. Then in fig. 9 we have reciprocal diagram G A, A B, B C, C D, D E, E F, F H representing to scale the loads, and K, H K the reactions. Drawing K L, A L, I, K M, M N, B N, N O, O P, C P, P Q, Q R, R S, S T, T U, U K, and F V, V K parallel to the members of the truss, we have these lines also representing to scale the magnitude of the stresses in the parts of the truss to which they are respectively parallel.

In fig. 10 is shown the frame diagram of a Whipple-Murphy girder with the load on the upper flange. As in the last example, the arrows downward indicate the direction of the loads, and those upward the reactions. The external spaces are lettered A, B, C, D, E, F, G, H, K, and the internal spaces L, M, N, O, P, Q, R, S, T, U. Then in the reciprocal diagram, I, we draw, representing the known forces to scale, G A, A B, B C, C D, D E, E F, F H, H K, H K and parallel to the members of the truss we draw the lines A L, K L, L M, K M, M N, B N, N O, O P, C P, P Q, Q R, R S, S T, T U, U K, F U, U K, these, therefore, give us to scale the magnitude of the stresses in the members of the truss.

In fig. 12 the frame diagram of a lattice girder is given, the load being on the upper flange, and in fig. 13 the reciprocal diagram. The only point which is likely to puzzle the student at starting is the position of the points *a* and *d* in the reciprocal diagram. The diagonals being, as usual, in lattice girders, drawn at the angle of 45°, G L will be half G K, and H d half H K.

It will be noticed that in working out the reciprocal diagram, R and S come at the same point, U, W, and T at the same point, and I and V at the same point. This indicates that the members of the truss R S, T U, U W, V X, have no stress brought upon them by the loading of the truss. They serve, therefore, only to stiffen the members to which they are attached against the tendency to bend laterally. It would be instructive for the student to work out examples of the Warren, Whipple-Murphy, and lattice girders, with the loads recently applied to the examples we have given, noting, as in the case of our lattice girder, that when lines are reduced to points in the reciprocal diagram, the members they represent are free from stress.

CHAPTER XVII.

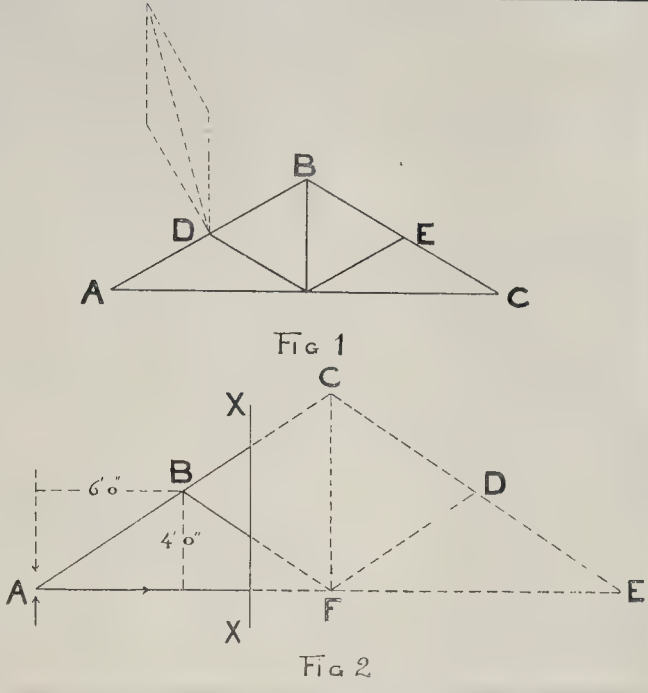
Now dealing with the stresses on the parts of a roof truss by means of a reciprocal diagram, we have in the examples given assumed that the load in each case was a vertical one; and this is true as far as the load the roof itself is concerned, and it is often taken in practice, sufficient weight being allowed for the probable load of snow and weight of wind. For more exact calculations, however, and to calculate precisely the effect which would be produced on a roof by the wind pressure, it is necessary to consider the angle at which this meets the inclination of the roof, and to calculate the stresses as due to forces which may be resultant from the wind pressure and the weight of the roof. Let us suppose in fig. 1 we have an ordinary king post truss. Here the weight acts vertically downwards at the points A, B, C, D, E, whilst the wind pressure acts upon the roof at various angles, of which it is difficult to say anything more precisely than that it will probably not, in any very exceptional circumstances, be vertically downwards. If we assume that the wind is acting in a horizontal direction, with a force of, say, 30 lbs. to the square foot, we have a formula for calculating the wind pressure normal—that is, perpendicular to the roof plane, which is this:—

Normal pressure = $P (\sin. \alpha) 1.84 \cos. \alpha - I$, where P is pressure of wind on a vertical surface one square foot (say 30 lbs.), and α is the angle of inclination of the roof.

This works out to about—

25 lbs. per square foot for one-fifth pitch.
30 " " " one-fourth pitch.
30 " " " 30° slope.
36 " " " one-third pitch.
43 " " " 45° slope.

We therefore have to find the resultant due



to this normal wind pressure and the weight, which can be obtained by the parallelogram of forces as indicated by the dotted lines on our diagram. The diagonal of the parallelogram represents in magnitude and direction the resultant of the forces acting upon the roof at the point D.

There is another method which may be employed for finding the stresses in parts of a roof or other trusses, the "method of sections" which is occasionally useful when the stress in one or a few members of the truss is required rather than those in the whole, and this method is rather quicker for this limited purpose than the reciprocal diagram. It is also useful as a check on the accuracy of the results found by the reciprocal diagram. These should, of course, be perfectly correct, but their accuracy depends upon precision in drawing, and is therefore not always quite perfect.

The method of sections may be thus explained:—The truss or other construction of which the stresses are to be investigated is assumed to be divided into two parts by an imaginary section line, which need not necessarily be a straight one, and which should preferably cut through three of the bars or members of the truss.

The next point it is most important for the student to understand, as upon it depends the rationale of the "method of sections."

In a properly designed and constructed truss the members are under stress and the truss is kept in equilibrium by the sufficient resistance to the stress offered by the parts of the truss. If, therefore, the truss were actually cut in the manner of the assumed section, each or either of the parts would still be kept in equilibrium if to the severed members were applied forces equal to the stresses they experience in the complete truss.

This, then, is the basis of the "method of sections," and by taking moments about a suitable point, we can find the stress in any one of the severed bars that we please.

Let us suppose that in a king post truss we desire to find the stress in the tie beam. In fig. 2 we have the frame diagram of our truss with an imaginary section line X X. Each part of the truss would still be in equilibrium if forces equal to the stresses were applied to the severed bars. Let us deal with the left-hand part of the truss and take moments about the point B, at which two of our three severed members meet, remembering that forces tending to produce revolution about B in the direction of the hands of the clock are positive that

those tending to produce revolution in the opposite direction are negative, and that as the forces are in equilibrium the sum of the moments is zero. The forces with which we have to deal are the vertical pressure downwards of the part of the load on the roof acting at A, the vertical reaction upwards of the support at the same point and the horizontal tension in the tie. These we have indicated by arrows. The downward pressure at A let us call W, the vertical reaction R, and the tension T; the perpendicular distance from B to the direction of W and R we will call *l* and that from B to the tie beam *m*. Then we shall have for the sum of our moments about B,

$$Rl - Wl - Tm = 0.$$

Let us assume that R is 2 tons, W is $\frac{1}{2}$ ton, *l* is 6 ft., and *m* is 4 ft. Then we have

$$(2 \times 6) - (\frac{1}{2} \times 6) - (T \times 4) = 0$$
$$12 - 3 - 4T = 0$$
$$4T = 9$$
$$T = 2\frac{3}{4} \text{ tons.}$$

From this example will be seen the reason for preferably taking a section line that passes through three of the members of the truss and taking moments about the point of junction of two of them. We thus have in our equation of the moments one unknown term only, and are thus able to find at once the value of the stress in the particular member which we desire to investigate.

In a similar way we can find the stress by the same method of sections in any other member of the truss. For example, if we wished to know the amount of the stress in BC, we could use the same sectional arrangement as in fig. 2, and take moments about the point F; thus:—Let us call the vertical load at B, W_2 ; the stress in BC, P; the perpendicular distance from F to the vertical from B, *l* (it being the same as from B to the direction of W and R above), and the perpendicular from F to BC, *p*. Then we have—

$$(R \times 2l) - (W_2 \times l) - (P \times p) = 0.$$

Let us assume $p = 6\frac{1}{2}$ ft., which it scales nearly, and $W_2 = 1$ ton, then we get

$$(2 \times 12) - (1 \times 6) - (P \times 6\frac{1}{2}) = 0$$
$$24 - 6 - 6\frac{1}{2}P = 0$$
$$6\frac{1}{2}P = 18$$
$$P = 2\frac{7}{8} \text{ ton.}$$

In a similar way also the stresses on parts of a Warren, a Whipple-Murphy, or a lattice girder, or, indeed, on any trussed form, can be found. The principle and the method are the same in all cases, and the student would do well to work out examples for himself, remembering that the sectional lines need not be

vertical nor even straight, but may be circular, or, indeed, of any curve, care being taken as a rule to pass through three members of the truss, although even this is not absolutely necessary if the line be so taken that all the intersected bars save one meet at the same point; thus, we could find the stress in C D, fig. 2, by taking a section line passing through A F, B F, C F, C D, and taking moments about F.

OBITUARY.

HERR F. BÖMCHES.—The death is announced of Herr Friedrich Bömches, Director of Harbour Construction and Chief Inspector of the Southern Railway (Austria). Herr Bömches died on March 22 at his residence at Döbling, at the age of sixty-eight. The new harbour at Trieste, with which his name is mainly associated, was built under his direction. The increasing commerce of Trieste made this work necessary, a harbour being required which should enable goods to be transferred immediately from railway to ship. The work was commenced in 1868 and finished in 1883, and cost 14,600,000 gulden. The harbour consists of two large basins, and another of smaller size enclosed by dams for petroleum-laden vessels. The basins are guarded by a dam 1,092 metres long. Herr Bömches was equally industrious with his pen, and wrote several works on the subjects in which he had special knowledge. At the beginning of the year 1890 he was entrusted with the building of the new harbour at Varna. He was a Knight of the Order of Francis Joseph and of the Legion of Honour.

GENERAL BUILDING NEWS.

RESTORATION OF ST. CUTHBERT'S CHURCH, HAYDON BRIDGE. This church, which has been undergoing restoration for the past few months, has been re-opened. The old round-headed sash windows have been replaced with tall two-light windows. The ceiling, formerly flat and plastered, has been opened out to the ridge and covered with new timber. The chancel has been enlarged by about 15 ft., and is covered with a panelled roof. The east window has been fitted with stained glass. Below the east window, a reredos of carved oak has been placed. The old gallery has been removed, and the tower opened out with a porch. A new pulpit, with carved oak and stone base, has also been erected. The whole work has been carried out from plans and designs by Messrs. Hicks & Charlewold, architects, Newcastle-on-Tyne.

CHANCEL, ST. GEORGE'S CHURCH, NOTTINGHAM.—A new chancel has just been consecrated at the Church of St. George, Nottingham. Plans were prepared by Mr. G. F. Bodley for the erection of a chancel, organ chamber, vestries, and side chapel, but for the present it has been found impossible to carry out the original scheme in its entirety. The chancel is furnished with new choir stalls and a reredos, and the organ chamber is situated on the north side. Vestries, a side chapel, and other smaller details have yet to be added.

ESTABLISHED CHURCH, TORRY, ABERDEEN.—A new Established Church is to be erected at Torry, in Walker-road. Only the nave and main part of the structure will be proceeded with at this stage, although the remainder, consisting of the transept and semicircular apse, will be added as soon as the funds will permit. The new church will be cruciform on plan, consisting of the nave and east and west transept, with a semicircular apse at the rear. The walls will be of grey granite—square faced rubble—with red granite dressings. When completed, the church will provide accommodation for about 800 worshippers; meantime space will be provided for 500. The total cost is estimated at 3,100l. Mr. Arthur H. L. McKinnon, Aberdeen, is architect.

TOWER, MAGHERALIN PARISH CHURCH, LURGAN.—The new tower and peal of bells in connexion with this church have just been dedicated. The tower was erected by Mr. J. Campbell, builder, Belfast, under the superintendence of Mr. Drew, architect, Dublin. The bells were cast to order by Messrs. Taylor, Loughborough.

RESTORATION OF ST. WINIFRED'S CHURCH, STAINTON.—The work of restoring the Church of St. Winifred, Stainton, near Doncaster, has been decided upon. At a meeting of the Restoration Committee Mr. J. D. Webster, of Sheffield, the architect to whom the restoration has been entrusted, received instructions to proceed with the works at once. The tender of Mr. James Fisher, of Ekeington, was accepted.

RESTORATION OF ST. HELEN'S, AUCKLAND, DURHAM.—The interior of this church has just been restored, and the building was reopened on the 13th inst. The work has been carried out by Mr. Hudson and Mr. Bell, the carving being by Mr. Keele, Bishop Auckland. The architects are Messrs. Hicks & Charlewold, of Newcastle.

RESTORATION OF KING'S CLIFFE CHURCH, NORTHAMPTONSHIRE.—The Church of All Saints, King's Cliffe, has just been reopened after restoration. At the time of the first restoration of the church in 1862 there was a stone staircase leading to the ringing chamber and roof loft, which has

since given place to the present iron corkscrew step-way. The supplementary restoration and outside repair has not consisted of any serious structural alterations, only the rebuilding of the tower on exactly the same lines as before, with the floor line restored to its ancient level. The stonework of the tower and spire has been repaired and pointed, and the repair and pointing of all the exterior stonework of the walls and parapets has been effected, while the lead roofs have been repaired and made secure against wet. The windows of the nave and aisles have been repaired and restored with their original ironwork, and the best of the old glass re-used and made up with new to match. Fragments of the ancient stained glass have been found stowed away in the church and scattered here and there in the village, and have been fitted together as well as the broken and missing parts will admit, and put into the tracery heads of the windows. Some of these fragments were taken out of the east window of the chancel when it was filled with modern glass in memory of the late Archdeacon Kays Bonney, and others, it is said, came from Fotheringhay church. The font has been moved, and set up on a new stone step. The work has been carried out by Messrs. Roberts & Co., of Stamford, under the direction of Mr. J. C. Traylen, Diocesan Surveyor, Stamford. A new clock has been provided out of the funds raised by the Victoria Jubilee Committee, and fixed on the tower. It was made by Messrs. Rowley Bros., London.

PROPOSED RESTORATION OF PARISH CHURCH, WELLINGTON.—We learn that All Saints Church, Wellington, will shortly be closed for extensive alterations and repairs. It is proposed to remodel the interior altogether. The existing iron columns will be faced with marble. The new columns and entablature will be of the Doric order on the ground floor, and of the Corinthian order above. The pitch of the galleries will also be increased. One new feature will be a lofty oak screen separating the chancel from the nave, and forming a morning chapel and chamber for the organ. The chapel will contain moveable seats, so as to permit of its being used for ordinary services. The organ, remodelled, will be brought down to the ground floor. The chancel itself will be raised, and new stalls provided for the choir. A portion of the gallery at the east end will be removed, but the seating accommodation will not be curtailed, as compensation will be found in the rearrangement of the seats. Mr. Dalgleish, of Wellington, is the architect.

PRIMITIVE METHODIST NEW SCHOOLS, ST. HELEN'S, LANCASHIRE.—The Primitive Methodist new Sunday-schools, erected in Kirkland-street, St. Helen's, at a total cost of about 1,800l., were opened on the 14th inst. The main hall is 52 ft. by 31 ft. There are twelve class-rooms. The work has been carried out by Mr. Joseph Ellison, builder and decorator, of St. Helen's, from designs prepared by Mr. John Wilson, architect, of Runcorn.

CATHOLIC SCHOOLS, BRADFORD.—On the 11th inst. the new Catholic schools, erected in connexion with St. Mary's Roman Catholic Church, Bradford, were opened. The new schools are two stories in height with basement, and have frontages to Wellington-street and Stott Hill. In the basement are two large rooms for young men's assemblies; while in another part of the basement are a laundry and kitchen. The ground floor is approached by a school entrance, and can be reached by three entrances without steps. The main room is 90 ft. long by 22 ft. wide, and there are four class-rooms. Cloak-rooms and lavatories are supplied at either end. The upper school, which is approached by two separate staircases, with short flights of ashlar steps, is 100 ft. long and 22 ft. wide, and contains a large hall, which is also a singing-room as well as lavatory and other accommodation. The interior woodwork is of best pitch pine. Messrs. Wray & Co., contractors, have executed the main portion of the building, and the other contractors are as follows:—Mr. W. H. Pick, joiner; Mr. M. Bland, plasterer; Messrs. Hill & Nelson, slaters; Messrs. Weardon & Co., plumbers; and Messrs. Duckett & Co., builders, lavatories. Mr. Edward Simpson is the architect. The total cost is about 6,000l., and the schools will accommodate some 900 scholars.

WESLEYAN SUNDAY SCHOOLS, LOCKWOOD, YORKSHIRE.—The new schools (Wesleyan) which have been erected at Mount Pleasant, Lockwood, were opened recently. The basement is approached by a sloping footpath and steps leading past the side entrance to the chapel, and also by a sloping footpath on the south side of the new schools, and contains an infants'-room, 36 ft. by 24 ft., with a square projecting bay, fitted up with an infants' gallery. Leading from this room is a flight of stone steps, 3 ft. 6 in. wide, up to the schoolroom floor, and the existing footpath is fitted up with a lift to go up to a class-room on the school-room floor. The principal entrances to the schools are from Pleasant-street, and face the Mount Pleasant Board Schools. There are separate entrances for boys and girls into lobbies, from each of which there is a flight of stone steps leading to the gallery and an entrance to the schoolroom. The schoolroom is 54 ft. by 31 ft. long by 36 ft. wide, 20 ft. 6 in. high to the wall-plane, and 38 ft. to the ceiling. At the back is a rostrum. On each side of the rostrum are steps which lead forward to the side galleries. The following class-rooms have been provided:—On the ground floor a library, a lecture-room fitted up with a small

rostrum, connected with the chapel by means of a covered gangway, and having a separate external entrance, and five class-rooms, all entering direct from the schoolroom. Seven more class-rooms enter from the gallery floor. A second gangway communicating with the chapel gallery is arranged at the level of the gallery floor. The heating is on the low-pressure hot-water system. The work has been carried out from plans prepared by and under the supervision of Mr. B. Stocks, architect, by the following contractors: Messrs. T. Bottomley, Son, masons, Lindley, Messrs. H. Hollingworth, Son, joiners, Moldgreen; Messrs. D. Taylor & Son, plumbers, Lockwood; Messrs. T. Longbottom & Sons, slaters and plasterers, Lockwood; Mr. Richard Heaton, painter, Paddock; Mr. Frederick Milne, heating and whitesmith's work, Lockwood. The total cost is expected to be about 4,000l.

COTTAGE HOSPITAL, BISHOP AUCKLAND.—A cottage hospital will shortly be erected in South-road, Bishop Auckland. The hospital will be 150 ft. by 90 ft. The building will be set back 30 ft. from the road, and the principal entrance will face the workhouse. On the right of the vestibule will be the male and female wards, each containing four beds, and having a southern aspect, whilst the two wards the nurse's room will be situated. The bath and lavatory accommodation will be arranged in close proximity to the wards, and the water-closets, slop-sinks, &c., will be shut off from the wards by ventilated short passages. On the left of the vestibule will be the matron's room, and the kitchen, scullery, laundry, mortuary, and disinfectant rooms will face the north. Three bedrooms will be provided on the first floor for the matron and attendants. The estimated cost of the building is under 2,000l., and whose supervision the work will be carried out, being Mr. James Garry, West Hartlepool.

FIRE STATION, EDINBURGH.—At the sitting of the Edinburgh Dean of Guild Court on the 7th inst., plans were passed for a modern fire station situated at the Cattle Market, Lauriston, the cost of which will be 23,000l. The frontage to Lady Lawson's street and Lauriston-street extends to 270 ft. The fire station proper is next Lauriston-street. The engine house has four arched openings. There is stabling accommodation behind each fire engine. Provision has been made for dealing with the construction of fire apparatus on the premises, and workshop accommodation will be provided for fitters, blacksmiths, joiners, painters, and hose-repairers. The telephone room adjoins the engine house, and a recreation room is also provided. The whole of the ground floor is devoted to the requirements of the department. The first floor comprises the fire-master's residence, superintendent's residence, mess-room and dormitory for the single men, married men, and firemen. The second floor is set apart as married men's quarters. There are more quarters on the third floor, and a laundry quite apart from the dwellings. In the rear of the building is a hose-tower finished with a wooden fleche. Beyond the engine room is an office for clerks and the fire-master's private room. A gymnasium adjoins the recreation room. The ground floor main building is a recreation room for fire-drilling purposes, &c., and to the rear again is a secondary stable and miscellaneous out-buildings for storage and other purposes. The architect is Mr. Morham, the City Superintendent of Works.

GINSON PUBLIC HALL, GARELOCHHEAD, N.B.—The new public hall which has been erected on a site adjoining the Free Church, was opened on the 7th inst. The hall will seat about 350. Messrs. Barclay, of Glasgow, were the architects.

MECHANICS' INSTITUTE, CROSS ROADS, HAWORTH.—On the 9th inst. the memorial-stones of a new Mechanics' Institute for Lees and Cross Roads, near Haworth, were laid. Plans for the new building were prepared by Messrs. Judson & Moore, architects, Keighley. In the basement, in addition to the necessary offices, there is a gymnasium, the ground floor provides a library and committee-room, a conversation-room, a reading-room, and a billiard-room; whilst on the first floor there are five class-rooms, intended to accommodate the science and art classes. The contracts let amount to about 1,200l.

THE CAMBRIDGE UNIVERSITY UNION.—A scheme is prepared, with the assistance of Mr. Alfred Waterhouse, R.A., for an enlargement and renovation of the debating-hall at an estimated cost of at least 800l., towards which past members of the Society are invited to contribute to the present buildings were erected about thirty years ago in place of the old rooms in Green-street. Mr. Waterhouse was the architect of the University Union debating-room at Oxford.

THEATRE, MANCHESTER.—A new theatre has just been erected in Manchester. The building, which has been named the Metropole Theatre, is situated in the Old Road. The new house has been built from the plans of Mr. Alley, architect, of Altrincham, by Messrs. Broadhead & Co., contractors. The interior consists of pit, circle, and gallery, which have accommodation for four thousand people. The pit is reached from the street, the circle by an easy flight of stairs, and the gallery by inclines. The floors are of concrete, the

ers of iron, there are numerous exits, and a steel chain divides the stage from the auditorium. The stage is illuminated with the electric light from an installation on the premises. On the circle floor some extending the width of the building for use during the intervals for refreshment purposes. The Working-Men's Club, Kettering. A concert-room is 63 ft. by 43 ft. in dimensions, with dressing-rooms on either side of the stage. J. W. Hart was the contractor, and the total cost of the block will be about 2,000l.

COLCHESTER NEW TOWN HALL.—Lieutenant Colonel Smith, of the Local Government Board, had an inquiry at Colchester on the 13th inst. into application of the Corporation to borrow 2,000l. for a new town hall. The sum the Corporation sought to borrow excluded the cost of the Victoria Tower, which the present Mayor has proposed to present to the town. The architect (Mr. J. N. Belcher), produced the plans of the proposed new structure. Illustrations of the proposed building appeared in our issue of September 4, 1897.

FISH LABORATORY, ABERDEEN.—The Fisheries Board for Scotland has approved of a plan prepared by Mr. John Kitchin, City Architect, of a laboratory to be erected at the Bay of Nigg in connexion with the Board's new fish hatchery. The building has a frontage of about 56 ft. and a breadth of some 27 ft. The laboratory, situated on the right hand side of the entrance measures about 25 ft. long by 18 ft. wide. At the other end of the building is the entrance to the main passage, and extending to the back of the building, is the museum. The remainder of the floor space behind the latter apartment is occupied by a small storeroom and a lavatory.

DEPTFORD BATHS AND WASHHOUSES.—The site of these baths, which were opened on Wednesday, is a double frontage, the Lavender-grove being bounded by the new baths, whilst the other and main frontage to New Cross-road is reserved with one-third of the area for a future Vestry Hall Offices, which have been designed by the architect to make one whole with the present buildings. Arrangements are provided for men and women on either side of a central ticket office. An extra exit is provided from the gallery to the first class swimming bath, which contains a water space of 50 ft. by 35 ft., with a capacity of 120,000 gallons. The gallery seats 450. There are dressing-boxes for twenty-seven bathers, with lavatory attendant's compartment and a shower bath and latrines. This bath is to be available alternately for ladies and gentlemen. The second class swimming bath is 30 ft. by 27 ft., with sixty-one dressing-boxes and gallery over. In the front block netting-groove are provided the first class men's slipper baths for fifteen; second class men's slipper baths for thirty; first class women's slipper baths for five; and second class women's slipper baths for five. This block also contains a board-room 26 ft. by 18 ft., with superintendent's living room above. The public washhouse (with ironing-room) contains twenty-three separate cubicles, twenty drying racks, in which, by hot-air circulation, clothes will be dried in from twelve to fifteen minutes, and steam-driven centrifugal wringers. The towel laundry, with twelve separate drying horses, steam-driven wringers, and mangles. A boiler-house, and engine-room, with well and accumulator adjoining, three engines driving the well pumps, laundry machinery, and dynamos. The walls of the swimming and slipper baths and the lavatories are faced with glazed bricks, with blue brick moulded cornices and dressings. All the apartments have open roofs with wrought-iron principals, and are lighted by large central lanterns, and to the swimming-baths being augmented by side windows above the dressing-boxes, and the first class bath has an end window in faience and Portland stone. The dressing-boxes and gallery are in teak-pine with iron balustrades. There is a high living-board, to which a chute is to be attached. The swimming-baths are constructed with brick retaining walls and cement concrete bottom, the whole lined with Val de Traverses asphalt with lining of glazed bricks. By means of spray, under pressure from a copper sparge pipe in the shallow end of the baths, the dust and scum which invariably accumulate on the top of the water are driven off the surface into a trough at the end and carried away to the drains. The wastes of sufficient capacity to empty the large swimming-bath in twenty and the smaller in ten minutes. The divisions between the private slipper baths are of glazed stone, those to the first class being enamelled. The baths are of white enamelled freckly. Stairways round the swimming baths and under the second class slipper baths, in which run the hot and cold supplies, steam pipes, wastes, and drains. The lavatories in these, and the connections to the slipper baths, are in these subways, and are thus easily accessible for examination. The supply to each apartment is capable of being disconnected without affecting the supply to the remainder of the institution. The front elevation of the building is of red brick and Portland stone. The roofing

throughout is of Welsh rag slating (from Port Dinorwic). The water for the swimming baths is heated by steam injection in the water inlet. As a supplementary means of heating the swimming baths steam injector pipes are run in casings flush with the bath walls to keep the water up to its original temperature, or to raise the temperature after the water had cooled through the night. The water for the slipper bath is heated by steam injection. The exhaust steam from the engines is condensed and passed back into the boilers in the shape of hot water, thus ensuring a saving of fuel and water, and obviating the annoyance of exhaust steam passing through the roof. The atmosphere throughout the building is heated by means of steam piping and radiators, and extract ventilators and steam-driven fans to ensure circulation. The well has been sunk, 8 ft. in diameter, to the level of the chalk stratum, lined with cast-iron cylinders thence continued with a 24 in. open boring to a total depth of 250 ft. The pumps are double action and yield a supply of 50,000 gallons per hour, which, with the help of an 80,000 gallon cast-iron storage tank over the laundry, fills the large swimming bath in an hour, so reducing to the smallest limits the loss of time and public use during the change of water. The pumps are driven from a horizontal line by means of belting. An electrical installation has been provided with a 35 h.p. vertical engine and duplicate dynamos one being an auxiliary driven from the well engine when not required for driving the pumps. The dynamos can be driven to charge the lamps direct, or switched on to the accumulators, which are provided with a capacity of lighting 1,000 lamps. The swimming baths are fitted with patent 150 c.p. incandescent lamps, the general lighting being by 16 c.p. incandescent lamps. Mr. Thomas Dinwiddie has acted as architect to the Commissioners throughout. The builder is Mr. Holloway, of Deptford, and the building contract sum was 32,950l., including the engineers' sub-contracts secured by Messrs. Moorwood, Sons, & Co. of Sheffield and London, which included the boilers, laundry machinery fittings and engine and slipper baths, and water services throughout. The well contract with engine and pumps amounted to 2,645l., and was entrusted to Messrs. Tilley & Sons, of Walbrook. The electric light installation with engine, dynamos, and accumulators was carried out by Messrs. Joel & Co., of South Molton-street, at a contract sum of 1897l.

SANITARY AND ENGINEERING NEWS.

PIER, THE SANDBANKS, Bournemouth.—The new pier adjacent to the Haven Hotel, at the Sandbanks, has just been opened. The pier was built by Messrs. Facey & Sons, of London. The structure is supported on screw piles with a platform of steel girders, which are decked over with pitch pine. The gates and fences were supplied by Messrs. Howell & Co., Limited, of Poole, and the turnstiles by Messrs. Bayley & Co., of Manchester. The length of the deck of the pier is 92 ft. The fenders are composed of greenheart piles. Seats are provided. The entrance, at which a toll-house is situated, has been tiled by Messrs. Carter & Co., of Poole. The width of the pier at the sea end is 26 ft., and at the entrance 10 ft. The level of the pier is 8 ft. above high water. The architects of the pier are Messrs. G. Sanders & Goodger, of Bournemouth.

PROPOSED SEA WALL AND ESPLANADE, Bognor.—On the 5th inst., at the offices of the Bognor Urban Council, Mr. Herbert H. Law, an Inspector of the Local Government Board, held an inquiry into the application of the Council to borrow 2,000l. for the construction of a new sea wall and esplanade at the west end, near the Black Mill. Mr. O. A. Bridges, Surveyor, laid before the inspector plans of the proposed improvements, and gave particulars concerning the construction of the new sea wall and esplanade, which would be a continuation of the old part, and of the same width.

GRAVING DOCK, TROON, N.B.—The new graving dock at present in course of construction at Troon Harbour is now nearing completion. The engineers of the works are Messrs. McTaggart, Cowan, & Barker, Glasgow; and the contractors are Messrs. George Lawson & Son, Blairbeth, Rutherglen.

ABERDEEN WATER SUPPLY.—A meeting of the Water Committee of the Aberdeen Town Council was held on the 19th inst., when Mr. Dyack, Burgh Surveyor, submitted the report he had prepared with regard to the state of the aqueduct which conveys the water to the city. The committee then discussed the matter of substituting cast-iron pipes 8 ft. 6 in. in diameter for the cement aqueduct. The total cost was estimated at 126,000l. The committee came to no finding in the matter.

MANCHESTER SEWAGE WORKS.—These works, which have been carried out under the direction of Mr. Walter Le Maitre, C.E., of Bristol, were publicly opened on the 6th inst. The endeavour has been to carry out complete purification works upon a limited area of ground. After passing the detritus and screening chambers, the sewage—of a strong domestic character with some manufacturers' and slaughter-house refuse—is treated with ferrous, from two to three grains per gallon being found sufficient; it then flows through horizontal inlet pipes to 15-in. vertical tubes in the centre of the

Candy circular upward-flow precipitation tanks, and falls within two feet of the bottom on to spreading plates. There is an outer cylinder 5 ft. in diameter, reaching from about 6 in. above water level to 6 in. below the spreading plates; by this means, further contact with the ferrous is given, and at the same time the precipitated solids overlying the bottom of the tank are not disturbed by the incoming sewage; a large volume is thus enabled to be rapidly dealt with, a continuous flow is maintained, and the effluent delivered without loss of level. The tanks, two in number, are capable of dealing with a flow of one million gallons daily, and are fitted with Candy's patent automatic sludge removal apparatus; each tank is 24 ft. in diameter, with 15 ft. 6 in. depth of sewage, the total area occupied by them being about 64 square yards. After leaving the tanks the effluent passes through clarifiers, of which there are three, each 7 ft. in diameter by 8 ft. high. The space occupied by these clarifiers (which are capable of dealing with a similar volume of sewage as the tanks) is about 63 square yards. The effluent from the clarifiers runs on to concentrated polarite filters, which can deal with 1,500 to 2,000 gallons per square yard per 24 hours. The superficial area of polarite filters is about 480 square yards, so that the purification installation is purifying 1,000,000 gallons per day is contained within a total area of about one-sixth of an acre. The sewerage and sewage disposal scheme, which includes eighteen miles of sewers, has been completed under Mr. Le Maitre for less money than the contract price. The contractor for the work is Mr. H. Roberts, of Birmingham, and the purification installation adopted is that known as the International.

THE NATIONAL REGISTRATION OF PLUMBERS.—Dr. Matthew Hay, Medical Officer of Health for Aberdeen, presided at the annual meeting of the District Council for the counties of Aberdeen, Kincardine, and Banff, which was held at the Gordons College, Aberdeen, on Saturday last. The Chairman, in moving the adoption of the report, said that last year had been characterised by as much vigour in the movement as any previous year, if they had regard to what had gone on all round the country. The two most notable events of the year, no doubt, were the submission of the Plumbers' Registration Bill in Parliament and the preparation of the model regulations and by-laws for the drainage and plumbing work of buildings. The Bill more nearly reached the point of passing than ever it did before, coming to the third reading, when it was "talked out" on account of some slightly factious opposition. Mr. A. B. Robertson seconded the adoption of the report, which was agreed to. Mr. Kenneth Cameron, Sanitary Inspector of Aberdeen, moved: "That this meeting, believing that the registration of plumbers under Parliamentary sanction would greatly promote the public health by helping to ensure sound plumbing and drainage, and that the voluntary system at present in force, although accomplishing much good, does not adequately meet the purpose in view, resolves to cordially support the Plumbers' Registration Bill at present before Parliament, subject to suggestions, if any, for its improvement which the District Council may make, and instructs the Council to use its utmost endeavour to aid the passage of the Bill through Parliament." Mr. J. F. Anderson seconded, saying that not only would the whole trade be in a much better position if the Bill passed, but the public even more so. Mr. R. G. Wilson, architect, proposed:—"That this meeting be of opinion that the model regulations and by-laws for the drainage and plumbing work of buildings prepared by a Committee of the six District Councils of the National Registration of Plumbers in Scotland, and recently published by authority of the Councils in congress, provide a reliable and well-considered code of regulations for such work, resolves that it is desirable in the interests of the public health that such regulations should be adopted and put into operation by all Municipal and Rural Authorities within this district as soon as may be practicable." They had by-laws of their own, he said, for some time in Aberdeen, and were working smoothly under them; but it was different when they went outside the city. They had nothing there to guide them, and he hoped some uniform system such as this would be adopted throughout Scotland. The resolution was agreed to.

CITY AND SOUTH LONDON RAILWAY.—The electric lifts for the new Islington extension of this railway are being made by the United Ordnance & Engineering Company, Limited, of London and Erith, with whom Easton, Anderson & Golden, Limited, are now incorporated. Each lift will be fitted with their patent gear, and will be capable of carrying about seventy passengers, and the average stroke will be 72 ft. The current required for working will be supplied from the generating station of the railway company.

STAINED GLASS AND DECORATION.

WINDOW, ST. HELEN'S, AUSTERFIELD.—A stained-glass memorial window has lately been fixed in St. Helen's Church, Austerfield. It is a three-light window containing standing figures which represent St. Peter and St. Hugh of Lincoln, with the Virgin Mary in the centre. Below these figures, which are placed on a "quarry" background, are the arms of

the dioceses of York, Southwell, and Lincoln, whose cathedrals are dedicated to St. Peter, the Virgin Mary, and St. Hugh. The parish of Austerfield having been at various times in these three dioceses. The work has been designed and executed by Mr. Herbert Bryans, of London.

JUBILEE WINDOW, MALVERN.—The unveiling ceremony of the Jubilee window, the gift of the women of Malvern, took place at the Priory Church recently. The window is at the back of the altar in St. Ann's Chapel, which is situated on the south side of the church. The history of the Priory in brief is depicted. Mr. C. E. Kemp was the designer.

CHRIST CHURCH, EBBW VALE.—A two-light window has just been fixed at the east end of the south aisle of Christ Church, Ebbw Vale, Mon., the subjects treated being "The Resurrection" and "Our Lord as the Good Shepherd." It has been placed as a memorial of a former vicar of the church. The work was carried out by Jones & Willis, of Birmingham and London.

ST. JAMES' CHURCH, HANDSWORTH.—A memorial window has recently been erected in the south aisle of St. James' Church, Handsworth. The subject of the window is the Raising of Lazarus, and, in the tracery, Our Lord Mary, and Martha, who had done what she could." The window was designed by Mr. T. W. Camm, and executed at his studio at Smethwick, Birmingham.

CHURCH OF ST. MARY-THE-VIRGIN, ALDERMAN-BURY, E.C.—This church of Wren's has recently been entirely redecorated. It consists of a nave and two side aisles, divided from each other by composite columns. In designing the interior colour scheme the general aim has been to keep the decorations in harmony with and subordinate to the architectural features of the building, while on account of the absence of stained glass it was felt that a somewhat dark tone of colouring was desirable. The nave ceiling is of the barrel-vault type, and has been tinted a delicate ivory, relieved with bands of light sage-green and terra-cotta, the main arches over the columns being light terra-cotta with cream-coloured enrichments, and the modelled plaster work light green and fawn colour. The main cornice, which extends down each side of the nave at the springing of the vaulting immediately over the columns, has been treated in light shades of terra-cotta, ivory, and cinnamon, with the enriched work gilded. The aisle ceilings are in harmony with that of the nave. The walls have been painted a medium Pompeian red, the upper part with panelled ornamentation, and bands of lighter colour and stencilled decoration between the windows, the dado being a dark green. The arches of the windows have been formed into panels in two tints of red, with gilded ornament forming imposts. The east end wall has been selected for the more elaborate part of the design, and has been treated in lighter shades of green, with diaper ornament in cream colour and light green, and emblems on either side of the large east window, in painted panels of an architectural character, with light ornament on a gold ground above and below. The lower part of the reredos has been decorated with diaper ornament in light green, terra-cotta, and gold on a cream ground, with tapestry dorsal hangings on either side. The altar-cloth has been specially designed by the architect in red antique velvet, with gold and red embroidery and applique work; three painted panels have also been placed in the reredos. The columns have not been painted, but have merely had all former colouring matter removed from them, so as to show the original face of the stone. Three pairs of old oak doors, the only remaining portion of the original woodwork, have been restored to the light of day, the paint with which they have been thickly covered having been removed, and the original surface laid bare. An interesting discovery was made with regard to the front oak doors. They had been concealed under a deal painted casing, and on the removal of this, a large number of lead bullets were found embedded in the oak. The whole of the recent works, which include the provision of electric light, have been executed from the designs and under the superintendence of Mr. Lewis E. G. Collins, architect, and the contractors were Messrs. Campbell Smith & Co. The church was re-opened for Divine Service on Wednesday, April 6.

FOREIGN.

FRANCE.—M. Scellier de Gisors, Inspector-General of *Bâtiments Civils*, has been elected Chief Professor of Architecture at the Ecole des Beaux-Arts, in place of the late M. Ginain. A fine altar has just been inaugurated in the Church of the Sacré Cœur at Montmartre. It is from the designs of M. Rauline, and is composed of marbles and onyx, the colours being harmoniously combined with embossed leather work, bronze inlay, enamels, and precious stones. M. Georges Achard, pupil of M. Falguère, has been commissioned to execute an allegorical group in bronze, which is to be presented to the Emperor of Russia by the commercial and industrial community in Paris. The group represents Nicholas II., led by Peace, who holds the French and Russian flags and an olive branch. On the pedestal is a Mercury, an allegorical figure of Industry, and two children with arms entwined. The Académie de Médecine de Paris, which has for some time been

occupying a building belonging to the Hôpital de la Charité, Rue des Saints-Pères, will shortly be transferred to a large building in the Rue Bonaparte, the fitting up of which will necessitate an outlay of 1,500,000 fr.—The architectural jury of the Société des Artistes Français is composed this year of MM. Coquart, Daumet, Deglane, Garnier, Laloux, Loviot, Mayens, Moyaux, Alfred Normand, Pascal, Raulin, Redon, Roussi, and Vaudremer.—The Bayeux municipality have commissioned MM. Leduc and Tony-Niel to execute a bronze statue of the poet and Alain Chartier, which is to be placed in one of the squares of the little town. The inauguration will take place in July.—The jury on the open competition for the building of a school for young girls at Lyons, have awarded the first prize to M. Delorme, architect, of Lyons; the second prize to M. M. Sandler & Cornet, of Lyons and Paris; the third prize to M. Tournaire, and the fourth prize to M. Calinaud, both of Paris.—The Government have decided to make a line from Bort to Neussargues, which will go through the Department of Cantal. This line will not only be of use for the industry of the country, but will be a great boon to the numbers of tourists who every year flock to the picturesque neighbourhood of central plateau.—The subject chosen for this year's competition by the "Société Académique d'Architecture de Lyon" is "Some Baths at the meeting of the Rhône and Saône."—The death of a clever sculptor, M. Ch. Aime Irvoy, has just been announced, at the age of seventy-four. He was a pupil of Ramey and of Dumoulin, and, in 1854, he obtained the second prix de Rome. In 1857, he was of Paris, where he was of the Ecole de Sculpture Architecturale at Grenoble. Amongst his numerous works we may mention a statue of "Ronsard," which is at Vendôme; a "Sentinelle Gauloise," which is at Grenoble; the front of the Hospice Civil, in the same town; and the marble medallion of General de Miribel in the Grenoble cemetery; also a bust of Ramey, which is in the Museum at Versailles. M. Irvoy died at Grenoble.—The death is also announced of M. Alphonse Girodin, painter, at the age of eighty-six. He is known principally by his religious paintings, and a large one entitled "Le Martyre des Macchabées" is in the Musée Saint-Pierre at Lyons.

AUSTRIA.—The castle in which the picture gallery of the Belvedere, Vienna, was situated is being adapted (now that the pictures have been removed) as a residence for a member of the Imperial family. The work is proceeding rapidly, and it is expected that it will be finished in the course of the autumn.—The Council of Vienna proposed to erect municipal brickworks, and a site was chosen. This, however, having been found too expensive, the matter has been allowed to drop.—Klosterneburg (and probably the neighbouring Kreitzendorf) is to be lit with electric light, and a dépôt is to be erected there at a cost of 200,000 florins.—Messrs. Siemens & Halske have been commissioned to carry out the work of erecting a central electric station at Vöslau; the amount of their tender was 150,000 florins.—The site for the theatre at Graz has been chosen; the cost of the building is to be 400,000 florins.—A new water supply is to be introduced into Grein, Upper Austria, at a cost of 15,000 florins, as a memorial of the Imperial Jubilee.—A piece of land opposite the two school buildings in Ruppersdorf, Bohemia, has been acquired by purchase for the erection of a new church.—A new church is also to be built in the newly opened cemetery at Neu-Brdjov, in commemoration of the Imperial Jubilee.—A meeting of those interested was lately held in Vrbno to discuss projects for making the River Moldau navigable. It was decided to make the present river-bed into a canal; the counter proposition to run a canal from Chyatehrub to Ourjstavl was emphatically negatived.—The cathedral at Agram, an eleventh-century building, one of the largest and finest buildings in Austria, has been undergoing restoration ever since 1880, when it was seriously injured by an earthquake. The two towers, which are to reach a height of 107 metres, will be erected this year, according to the plans. The cost of the work has up till now amounted to 3,000,000 gulden.

WORKING MEN'S COLLEGE, MELBOURNE.—We have received the prospectus for 1898 of the Working Men's College, Melbourne, which appears to cover a large course of instruction, including civil, mechanical, and electrical engineering, surveying, geometry, architecture and architectural drawing, &c.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.

Messrs. Doulton, of Lambeth, have removed their Manchester dépôt to Temple Chambers, St. James-square, Manchester, where they have opened large showrooms for the display of glazed faience fireplaces, mantels, baths, lavatory fittings, &c.—Dick's Asbestos Co., Canning Town, have opened City offices at 51 and 52, Fenchurch-street, E.C.

WORKMEN'S COMPENSATION.—From the report of the Sun Life Assurance Society, just issued, it is interesting at this juncture to observe that this institution has established a special department for the transaction of employers' Liability and workmen's compensation insurance, as well as for personal accident business.

NEW ALTAR, ST. MARY'S ROMAN CATHOLIC CHURCH, MORECAMBE.—A new altar has just been erected in the Lady Chapel of this church by Messrs. Boulton & Sons, Cheltenham, from a design by Messrs. Pugh & Pugin, London. It is in the Gothic style, the chief material used in its construction being Caen stone, with dark polished marble columns. The subject of the altar frontal is a carved representation of the Annunciation. In the reredos are sculptured panels, one on each side of the tabernacle, the subjects being "The Flight into Egypt" and the "Entombment of Our Lord." The sculptured figure in the centre niche over the tabernacle is of white statuary marble, and represents Our Lady of Dolours, to whom the church is dedicated. The front of the tabernacle is an ornament of repoussé lacquered brass work with the letter "M" (Mary) crowned in the centre.

PRESENTATION TO AN ENGINEER.—Mr. John Ward, C.E., who for nine years has held the position of Deputy City Surveyor of Sheffield, was entertained to dinner at the Cambridge Hall, Sheffield, on the 15th inst., on the occasion of his appointment as Borough Surveyor and Engineer of Derby. The City Surveyor (Mr. C. F. Wike) occupied the chair, and was supported by Mr. Ward, Mr. H. Malloy (Manager of the Tramways), Mr. A. Llewellyn Tel (Resident Engineer), Mr. J. Jackson (Superintendent of the Health Department), Mr. T. W. Newbould (Chief Architectural Assistant), Mr. J. T. Hall (head of the Sewers' Department), Mr. E. A. Green (Chief Building Inspector), Mr. G. E. Vint (Lancashire (Mr. Ward's successor), Mr. G. E. Vint and Mr. B. Powell (District Surveyors), and others. The City Surveyor proposed the health of the guests of the evening, which was responded to by Mr. Ward. "Other Departments" was proposed by Mr. J. T. Hall, and acknowledged by Mr. Malloy and Mr. Fell. Mr. G. E. Vint proposed "The Visitors, to which Mr. Laing, J.P., Surveyor to the Colony of Sierra Leone, formerly District Surveyor for the City of Arroyo, and Mr. G. E. Vinton, architect, late Chief Building Inspector, replied. Mr. Wike then made the presentation to Mr. Ward. It consisted of fish carvers, fish knives and forks, dessert knives and forks, and a spirit stand. It was accompanied by an address, bearing upwards of fifty signatures. There were also on view several marks of esteem which were presented to Mr. Ward a few days ago by the workmen of the Central District Highway Department.

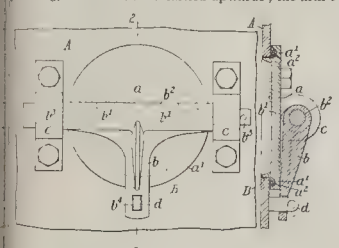
GLASGOW ARCHITECTURAL STUDENTS' VISIT TO DUNDEE.—The students attending the architectural and building classes at the Glasgow and West of Scotland Technical College visited Dundee recently and inspected several of the principal buildings in the city. Amongst the buildings visited were the Albert Institute, St. Paul's Episcopal Church, the new Post Office, the Royal Infirmary, the Nurses' Homes, the new Royal Bank, the Pearl and Scottish Provident Insurance Buildings, the Old Steeple, and East Parish Church.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—During the session the following buildings and works were visited on Saturday afternoons by students in attendance at the architecture and building construction classes in the above-named college.—Ruchill Hospital and the People's Palace (Mr. A. B. Macdonald, architect); the Western Infirmary Operating Theatres, &c. (Mr. John J. Burnett, architect); the Clyde Ironworks, Glasgow, new offices, 41, St. Vincent-street (Messrs. James Salmon & Son, architects); Messrs. James Howden & Co.'s new works in Colkshaws Town Hall (Dr. R. Rowand Anderson, architect); and Norwich Union Insurance Offices, St. Vincent-street (John Hutchison, architect). There was a large attendance at all the visits. On Monday, April 11, a party of forty students visited the following buildings in Dundee under the leadership of Professor Gourlay.—The Royal Arch; the old Custom House; the new Royal Bank in course of construction (Messrs. Peddie & Washington Browne, architects); St. Paul's Episcopal Church, erected 1853-1865 by the late Sir Gilbert Scott; the Albert Institute, by the same architect; and the Victoria Gallery by Mr. Wm. Alexander, the City architect; the new Pearl Insurance Offices; the Scottish Provident Insurance Offices; new bonded warehouses in the Seagate; new nurses' home and operation theatre at the Royal Infirmary; the new post-office, by Mr. W. W. Robertson, of H.M. Office of Works, Edinburgh; the Old Steeple, erected about the middle of the fifteenth century; the old cross of Dundee, near the steeple; and the East Church, where the new east window designed by Sir E. Burne-Jones and executed by Messrs. Morris & Co., was much admired. Another party of former and present students visited Durham for a few days.—Easter to measure and sketch in the Cathedral, the castle, and other buildings in the city and its vicinity, including Finchale Abbey.

ELECTRIC LIGHT EXTENSIONS, WALLASEY.—On the 14th inst. Mr. Walter A. Ducal, Local Government Board Inspector, held an inquiry at the Public Offices, Egremont, with reference to the application of the Wallasey Urban District Council for powers to borrow 20,785 l. for electric light extensions, 5,600 ft. for new water mains and meters, 1,824 ft. widening and improving Seabank-road, Egremont, Withen-lane and Zigzag-road. It was stated that 840l. profit had been realised from the electric

supply since the system was installed in January last year, and applications for electric energy were coming in such numbers that the Council could not meet the demand without extending their works.

HEWENS' PATENT MANHOLE COVER.—This is a patent for ensuring tight pressure on a manhole cover to a tank or drain while rendering the cover easily removable, without the necessity of taking out screws or rivets. There are several patterns for different special purposes, but the one illustrated may be taken as representing the principle. After the cover is put in, the cross-bar, *b*, in diagram, is placed across it and secured into the brackets *c* by centre-pins *b*, with the arm *b* turned upwards; the arm *b*



Hewens' Patent Manhole Cover.

is then brought down into the position shown on section, and pinned down at *d*, while at the same time a cam on the heel of *b* presses down the cover tightly. To release the cover it is only necessary to remove the pin at *d* and release the arm, and remove the pin *b* so as to dismount the closing arm from its bearings. The arrangement is simple and effective; and the cover, when closed, is held down by a powerful leverage obtained from the cam on the arm *b*.

IMPROVEMENTS IN THE CITY.—A report has been made by Mr. D. J. Ross, C.E., Engineer to the newly-formed Public Health Department of the Corporation upon the works that have been carried out in 1897—being the last year of office of the Commissioner of Sewers. Plans and estimates are prepared for widening Lower Thames-street, at its eastern end, to either 40 ft., 50 ft., or 60 ft., and similar alterations are entertained in respect of London-wall (north side), where some leases belonging to the Bridge House Estates will expire in midsummer of next year, and in respect of Fenchurch-street between Ironmongers' Hall and Cullum-street; by setting back certain frontages in Leadenhall, Fleet, and Fenchurch streets, together with Houndsditch, the widening of those thoroughfares has also been effected. A satisfactory report is given upon the experiment of lighting Great St. Helen's and Wood-street with the Welsbach incandescent gas lamps; it is contemplated to extend the system of electric lighting into the minor thoroughfares—in the main streets more than a third of the gas lamps are already dispensed with, the total number of electric lamps being 494.

PROPOSED IMPROVEMENTS AT CRIPPLEGATE.—Schemes have been drafted by the City authorities for the London County Council's Chief Engineer or effecting improvements in the district a portion of which lies within the limits of the recent fire Scheme A provides—under existing statutory powers—for a widening of Jewin-street on the south side for its whole length, and to extend the new thoroughfare by a curve southwards to join Fore-street at St. Giles's Church. The Corporation estimate the net cost of that new street, about 100 yards long, at 600,500*l.*, if it were made 60 ft. wide, but if the width is reduced to 50 ft., or 40 ft., at 536,600*l.* or 432,600*l.* respectively. A supplementary scheme (scheme C) contemplates an extension of the street under scheme A, from the west side of Aldersgate-street to West Smithfield, to be 60 ft. wide, with a spur, 30 ft. wide, eastwards of the church of St. Bartholomew-the-Great into Long-gate. Scheme B, which, we gather, is prepared by Sir A. R. Binnie, comprises a new street, 60 ft. wide, to begin from the end of London-wall, at its junction with Wood-street, passing along Hart-street and Wood-street-square (both to be widened), across Well-street and Hamsell-street, and so, by a bend, to bring it into alignment with Edmund-place (to be widened along its entire south side), to reach Aldersgate-street. The net cost of scheme B is estimated by the Council's officers at 536,000*l.*; the two schemes A and B are those referred to in our report, p. 350 ante, of the County Council's meeting on Tuesday, April 5. The street of scheme B crosses the old wall within a few yards, and outwards from the tower or bastion at its north-western angle in St. Giles's churchyard. Well-street, originally Crowder's Well-alley, derives its name from the ancient well, cited by Stow, which Richard Whittington's executors copied in and arched over with stone, making stone steps for a descent to the well spring in the bank of the ditch just outside the wall. The well lay between Well-street and the present churchyard, south of St. Giles's vicarage-house, and the approach to it may be found, we

believe, beneath the ruins of one of the burnt warehouses in that street.

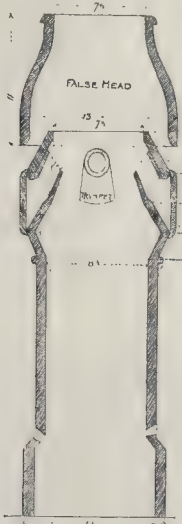
THE SLATE TRADE.—Reports have been circulated of possible friction at the Penrhyn Quarries in connexion with the quarrymen's holiday on May 2, but we do not anticipate any disturbance, especially bearing in mind the accounts of the strike fund which have been recently published. The total amount collected from all sources was 19,161*l.* odd; on the other hand the men lost eleven months' wages, about 150,000*l.* The visible supply of slates is rather larger than at the corresponding period of last year, but trade promises well as the season advances.

"EXCELSIOR" WALL AND CEILING SLABS.—These are a light kind of slab, of incombustible material, which can be made in large or small sizes, and can either be used for partitions or be nailed to ceilings as an incombustible shield below the joists. When used as partitions the slabs are set up on edge and thin iron rods passed through holes in the plates to connect them; the partition is also additionally strengthened by clips built in and turned up, or round angles. The surface of the slabs is roughed for a plaster key. The material appears to be worth the attention of architects. The patentees are Messrs. Van der Vygh Bros. of Amsterdam, and their agent in London is Mr. A. J. Van Ostveen, who intends in a few days to have a test exhibition of the resistance of the material to fire.

THE "NOVELTY" THEATRE, GREAT QUEEN-STREET.—Some extensive alterations, with repair and decoration, are about to be carried out for Mr. W. S. Penley, from the designs and under the superintendence of Messrs. Murray & Foster. The theatre was planned and designed by Thomas Verity (ob. May, 1891) and opened on December 9, 1882, under the name it now bears; it has since been known for a while as "Jodrell's," and we understand that its name will again be changed.

MESSRS. RAPHAEL TUCK'S NEW PREMISES.—Messrs. Patman & Fotheringham ask us to mention that they are the contractors for this building, of which the foundation stone was laid the other day, as mentioned in our columns already.

THE "CERTAINTY" SMOKE-CURING COWL.—This is one more addition to the almost innumerable array of cowl which have been devised for the cure of one of the most troublesome nuisances known to the modern householder—a smoky chimney. The ideas it combines are by no means new, consisting as they do of a cone or false head over the top of the cowl and trumpet-mouthed upward inclined openings in the sides of the cowl or shaft. We do not remember to have seen a combination of these devices in one cowl before, although experience has proved that each of them has a value in certain



The "Certainty Company's" Chimney Cowl.

cases, but it is beyond question that no form of cowl will cure all cases of smoky chimneys. For the purpose of resisting a downward current of air on the top of a chimney, there can be no doubt that this may be classed amongst the useful palliatives of the evil.

PIPE CLIPS.—Messrs. Chas. Winn & Co. (Birmingham) send us a specimen of their wrought-steel pipe clips, made in various sizes, for fixing pipes to walls. They have a good appearance, and are at once light and strong, and well fitted for their purpose.

THE METROPOLITAN TABERNACLE BURNED.—This well-known edifice, so closely connected with the work of the late Rev. C. H. Spurgeon, was

practically burnt to the ground on Wednesday last, the 20th inst. The conflagration is generally believed to have been due to an over-heated flue. It was a solid edifice of stone and brick. The principal distinguishing feature externally was the portico, the entablature and pediment of which are supported by six Corinthian columns. The building was erected in 1860-61 from the designs of Mr. W. W. Pocock, at a cost of about 32,000*l.*

CAPITAL AND LABOUR.

BARRY BUILDERS AND THEIR MEN.—A meeting of the Barry Builders' Association was held recently, under the presidency of Mr. G. Rutter, when a deputation was appointed to meet the operative stone-masons to discuss certain alterations the Association is desirous of making in a code of working rules submitted to them for consideration and approval. A deputation was also appointed to meet another deputation of the Operative Society of Plasterers to discuss certain alterations and additions they are desirous of making in their existing working rules. A discussion took place as to the advisability of the Association being affiliated to the West of England and South Wales Federation of Building Trades' Employers, and the National Association of Master Builders of Great Britain, it being pointed out that it would be advantageous in case of any dispute arising. The secretary (Mr. J. Prout) was instructed to write and obtain further particulars as to joining the same, and to report at the next general meeting.

THE DISPUTE IN THE BIRMINGHAM BRICK TRADE.—The dispute in the Birmingham brick trade was settled on the 13th inst. at a conference between six representatives of the masters and an equal number of representatives of the men. It will be remembered that the men belonging to the National Union of Gasworkers and General Labourers recently served notices upon the brick manufacturers in the district demanding the formation of a Conciliation Board, and an advance of 10 per cent on the pieceworkers' wages and 3*d.* an hour on those of the day workers. After a long discussion a compromise was effected. The men will receive an advance in their wages. The agreement will hold good for two years. With regard to the proposed constitution of the Conciliation Board, it was decided to resuscitate the old Board to deal with trade matters until the first week in May, when another meeting will be held to further consider the subject.

MEETINGS.

FRIDAY, APRIL 23.

Architectural Association.—Mr. H. B. Creswell on "The Morality and Economy of Competitions," 7.30.
Royal Institution.—Mr. W. H. M. Christie, M.A., on "The Recent Eclipse," 9 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. M. W. W. Henty on the "New Cut Swing-Bridge, Swansea," 8 p.m.

SATURDAY, APRIL 23.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Beedington Sewage Farm, Croydon.
Edinburgh Architectural Association.—Visit to St. Mary's Cathedral, Chapter House, Singing School, and Mrs. Coates' House.
St. Paul's Ecclesiastical Society.—Visit to the Church of St. Margaret, Lothbury, 3 p.m.

MONDAY, APRIL 25.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection at the St. Pancras Destructor Station, Georgiana-street, Great College-street, Camden Town, 3 p.m. (2) Professor H. Robinson on "Sewage and Sewage Disposal," 8 p.m.
Society of Arts (Cantor Lecture).—Dr. D. Morris on "Sources of Commercial India-rubber," II, 8 p.m.

TUESDAY, APRIL 26.

Royal Institution.—Mr. T. C. Gooch on "Phases of Art: Past and Present," II, 3 p.m.
Institution of Civil Engineers.—Annual General Meeting of Corporate Members' Report of Council; Election of Council and Auditors, 8 p.m.

WEDNESDAY, APRIL 27.

Architectural Association Discussion Section.—Mr. J. Humphrey Jones on "Hospitals: principally those for isolation purposes."
Institution of Mechanical Engineers.—Ordinary General Meeting. Inaugural Address by the President, Mr. S. W. Johnson, 7.30 p.m.
Society of Arts.—Captain W. de W. Abney, C.B., on "Photography and Colour Printing," 8 p.m.
Liverpool Engineering Society.—Annual Report of Council; Election of Officers; Paper by Mr. Andrew Hamilton on "Diagrams as Illustrating Ship and Engine Performances," 8 p.m.

THURSDAY, APRIL 28.

Sanitary Institute.—Mr. Charles Jones on "Scavenging, Disposal of House Refuse," 8 p.m.
Institution of Mechanical Engineers.—Anniversary Dinner, Freemason's Tavern, 8.30 p.m.
Society of Antiquaries.—8.30 p.m.
Civil and Mechanical Engineers' Society.—Mr. H. W. Ravenhew on "The Economy of Manual Labour in Relation to Engineering Calculations," Hotel Victoria 7 p.m.

30,000.—TILES AND OTHER ARTICLES OF CERAMIC

CARDIFF.—For the erection of St. Paul's New Congregational Church, Cowbridge-road, for the Committee. Messrs. Veal & Sant, architects, Cardiff.

For the church, exclusive of galleries	For the church, including galleries to seat 175
Shepton & Son.....£1,595 3 0	£1,454 0 0
W. Matthews.....553 0 0	4,626 0 0
Symonds & Co.....3,450 0 0	4,573 10 0
O. Punnell.....3,481 0 0	3,571 0 0
W. H. Ingleson.....3,352 0 0	3,675 13 0
Knox & Wells.....3,437 0 0	3,629 0 0
Turner & Sons.....3,352 2 3	3,822 4 0
C. C. Dunn.....3,104 0 0	3,573 0 0
W. T. Morgan.....All of Cardiff	3,441 0 0

* Reduced to £1,645, and accepted.

CHESTERFIELD.—For the erection of Primitive Methodist Chapel, near Chesterfield. Mr. W. J. Morley, architect, 269, Swan-arcade, Bradford.

Messrs. Newbrook, Plastering, and Slating	
W. Oakley, Roberts	
Joinery—W. Wilson & Son, Castleford	£1,800
Painting—Aves & Boulton, Mansfield	
Painting—Harland & Son, Bradford	

EGHAM.—For the erection of villas and shoeing forge, Egham Hill, for Messrs. W. & E. Oldridge. Mr. J. W. Gades, architect, Egham.

W. Simpson.....£1,556 15 6	C. Buckeridge.....£983 0 0
W. Brachamp.....1,128 0 0	W. L. Litchwell (with- drawn).....940 10 0
C. Seale.....925 12 0	

* Accepted.

HARROW.—For the erection of disinfectant buildings, &c., for the Urban District Council, Harrow. Mr. J. W. Gades, architect, Harrow.

J. & J. Bailey, Walsby & Co., Harrow	£1,235
E. Gough & Co., Hendon	274

* Accepted.

LEEDS.—For additions to the Friends' School, Rawdon, for the Bicentenary Committee of the Rawdon Friends' School. Messrs. Jackson & Priestman, surveyors. Quantities by surveyors:—

William Johnson.....£91 0 0	H. Kendall.....£80 0 0
J. Walker & Sons.....51 0 0	T. Obank & Sons.....542 0 0
William Atkins.....716 0 0	W. Fleisher & Sons.....655 10 0
W. Hargreaves.....716 12 5	Rawdon (accepted) 655 10 0

LANGLY.—For the erection of school buildings, &c., boys school, with additions to the infant department, for the School Board. Mr. J. B. Morgan, architect, New Road, Langley.

D. Jenkins.....£1,340 0 0	T. & J. Brown.....£1,609 0 0
F. Evans.....3,123 0 0	B. Howell & Son.....2,550 4 0
G. Mercer.....2,585 0 0	

LANGLY.—For the erection of a school, St. Paul's, for the Langley School Board. Mr. J. B. Morgan, architect, Langley.

D. Jenkins.....£1,340 0 0	G. Mercer.....£1,609 0 0
F. Evans.....3,123 0 0	B. Howell & Son.....2,550 4 0
T. & J. Brown.....2,585 0 0	

LONDON.—For repairs and repainting Homerton-row School, for the School Board for London.

Stevens Bros.....£560 10 0	Marchant & Hirst.....£248 0 0
Grove.....594 0 0	Silk & Son.....545 0 0
Crusoe.....371 0 0	

LONDON.—For general repairs at 34, Newington Green-road, London, for Messrs. Smith, Garrett & Co., brewers. Messrs. Foxham & Riches, architects, 102, Bromley High-street.

Osborn & Son.....£1,340 0 0	T. & J. Brown.....£1,609 0 0
F. Evans.....3,123 0 0	B. Howell & Son.....2,550 4 0
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APRIL 30, 1898.

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Malvern College New Chapel: Interior.—Sir Arthur Blomfield, A.R.A., F.R.I.B.A., Architect.....	Double-Page Photo-Litho.
New Buildings for Uppingham School.—Mr. T. G. Jackson, R.A., Architect.....	Double-Page Photo-Litho.
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Architecture at the Royal Academy.



THE architectural room at the Academy is not at its best this year. It is a curious mixture of various classes of work, many of the exhibits being very small and in

some cases very rough sketches, occasionally in a very eccentric style, and some of them certainly not worth exhibiting. The absence of plans and the predominance of mere pictures of buildings is more marked than ever, and so far from there being any progress in the direction of the full and technical illustration of a design by geometrical drawings, the tendency seems rather the other way. There are, however, three models placed in the room, and we are always glad to welcome this element in architectural illustration, and wish these were present in larger proportion.

The largest and most important of the models is a "sketch model" in plaster, but sufficiently finished for its purpose, of the south-west angle of Mr. Mountford's Museum and Technical School now in progress at Liverpool; and as a perspective view of the building is hung within a few feet of the model, one can compare the impression produced by the two. The model shows a part of the side elevation near the angle of the building, with the commencement of the curve of the end elevation. It shows the position and effect of the sculpture in the side pediment, and of the semi-domed niche under it, and the rusticated work on the piers which flank the end pavilion of the side elevation. We observe that while the pediment is shown with a curved finish, a segmental line, on the drawing, on the model it is shown as an angular pediment. As the model was made since the drawing, we presume this is the final decision, but we rather doubt whether it is an improvement, the more so as the curve (on plan) of the end of the building rather seems to call for the curved line of the pediment, as a matter of harmony of general treatment. In one respect the model is a useful commentary on the drawing, showing how a feature which looks satisfactory on a drawing may present a different aspect when it

comes to be modelled in the round. The upper part of the piers flanking the pavilion is formed by four columns broken by very bold rustication formed by projecting block courses which run round the three sides of the group of columns. In the drawing this looks very well, but as it works out in the model the columns seem too far from each other, back to front, for this kind of treatment, and the masses of stone which produce the rustication are so long, from column to column, as to produce rather the appearance of a kind of stone framework to hold the structure together. At the front, where the intercolumniation is less, it is all right, but at the sides the columns are overpowered by the rustication blocks, which have almost the proportion of so many lintels. We should recommend a little modification in this respect, to prevent this portion looking like a stone cage. In other respects the model looks very well, and shows a gratifying boldness in the character of the detail.

The other two models are much smaller, and both show complete buildings. One is a model for "a Westmoreland church" by Mr. John Hawes, and is, if we remember right, a representation in this form of one of the designs submitted for a prize offered by the Architectural Association a little while since. If so, it shows a very commendable spirit on the part of the author to have worked out his design in this form for exhibition at the Academy. The design is of a very simple, almost rude character, with plain buttresses battering as they go up, and plain, round-headed windows at the sides, within a recessed segmental wall-arch abutting against the sides of the buttresses. Some sculptured figures over the west door form the only ornament. The church is supposed to be built on a declivity which is duly shown on the model, and which influences the treatment of the design. The texture and colour of the model indicate very well the character of the rough walling supposed to be used. Altogether this is a very creditable piece of work. The other model, showing a house called "Rowallan," at Haslemere, by Messrs. Read & MacDonald, is rather too much like a toy. The real value of a model, generally speaking, is to show a part of the detail of a building in the round on a pretty large scale, so that its effect and projection can be estimated; a little model of

the whole is chiefly valuable to amuse the public. The house is one in L shape, with the entrance at the re-entering angle; a quadrant colonnade porch is introduced across the angle with pretty effect. A plan of the house is added, showing that the dining room has large windows facing south and west, the two worst aspects for a dining-room in summer, though they are unobjectionable in winter. It is curious how constantly this question of the aspect of sitting rooms is overlooked in house-planning.

Coming to the drawings, it is difficult to select any as being especially the most powerful drawings in the room, but we may suitably take the works of the Academicians first. The works of each exhibitor, where he has more than one, are as far as possible grouped, or at least placed near each other, and Mr. Jackson's three contributions are placed together at the end of the room. These are the New Schools at Oxford (his diploma drawing) the chapel at Giggleswick School, and the new buildings for Uppingham School (Nos. 1,646, 1,647, and 1,648). The first named represents a building which is already well known as a piece of very refined work of the modern Free Classic school, or the variety of Classic which has become a favourite in recent days, for it is not so much a modern school as a revival, except in regard to a few details. It is a satisfactory drawing to look at, not only for the architectural refinement of the building represented, but for the fine artistic character of the drawing, which does not show the over-careful and wrought-up work of the professional draughtsman, but is a very free piece of pen-and-ink drawing. The additions to Uppingham School are illustrated in the present number, a view of the schoolroom designed by Street being included in the drawing, and we may congratulate the architect on his success in contriving to give his own character to the new buildings, while at the same time keeping them sufficiently in harmony with Street's work. It will be observed that the flank of the new building which faces the schoolroom is treated in a manner more decidedly Gothic than the other portions, as if the building paid a little compliment here to the work of the older architect to which it is contiguous at this point. Mr. Jackson's third work, the chapel for Giggleswick School, is more original and more out of his usual style of design than the other

two. The central feature is a leaded octagon cupola, divided from the wall by a small and perhaps rather inadequate cornice; the walls which support the cupola are treated with a slight batter which aids in giving a special character to this portion of the design. The bays of the substructure which buttress the cupola are treated with gables with a sharply-pitched rake on each side, leading up to a gable in reversed curves; this is also characteristic but not very graceful in effect. In the wall of one bay is a large traceried window, in the other one which comes into the view there is a very deep central buttress as well as side ones of the same depth; these three great slices of wall side by side do not produce a very good effect. A plan, if one had been given, might have shown a reason for this difference in treatment, and for the central buttress on one of the bays; but none of the three drawings have plans of any kind attached to them. We wish Academy architects would set a better example in this respect; it is they especially who ought to do so, and to make a stand against this system of illustrating architecture by pictures of the outside of a building only, with no indication of its structure or of the working out of plan and elevation in combination.

Another school chapel is shown by another Academy architect, Sir A. Blomfield, who exhibits a fine drawing, made by Mr. Paul, of the interior of the new chapel at Malvern College (1702); of this also we publish an illustration in the present number, to which we may refer the reader; it is orthodox Late Gothic and presents nothing for special comment. Professor Aitchison exhibits a drawing of the decoration of a chapel in marble mosaic, and painting (1604), shown in two sections and a small plan; our illustration gives the lines and general effect of the design, unfortunately only in monochrome. The materials used are described in the paragraph under the head of "Illustrations." The general result of the distribution of material is to give a rather heavy and rich colour to the lower portion, supporting a light and playful treatment in the dome, which will thus be lifted and lightened in effect. The effect of the colour combination is rich and harmonious, the only thing that strikes us as a little harsh is the strong horizontal banding of light and dark on each side of the window, which seems rather too strong for the rest of the work, but in actual execution it may not appear so. Mr. Bodley exhibits an external view of the chapel at Allerton Church, Leeds (1712) and a design for a pulpit at St. Michael's Croydon (1714). Mr. Waterhouse and Mr. Norman Shaw do not exhibit this year.

The largest drawing in the room is Mr. H. Wilson's huge sketch in crayon of the baldachin and rearrangement of chancel now in progress at St. Bartholomew's Church, Brighton (1711). The drawing is not as effective as Mr. Wilson's water-colours are, nor does it indicate much of the detail of the work, nor is there any plan to show the rearrangement of the chancel; and it may well be questioned whether such a drawing as this, on so large a scale, has any right to usurp so much of the wall space of the small and inadequate room devoted to architecture. It is a clever *tour de force*, done without much care, and of no value whatever as an architectural illustration, though no doubt it looks well on

the wall, and that seems to be what is chiefly thought of in selecting the architectural drawings.

The number of public buildings of the most important class among the drawings is less than usual. Messrs. Lanchester, Stewart, & Rickards exhibit a perspective drawing of their successful design for the Cardiff Municipal Buildings, which we hope is going to be carried out. The design of the tower, which was the weak point in the competition design, has been modified and considerably improved, and the design of the whole group as here worked out in perspective quite confirms the good opinion which we gathered from the elevations and plans as shown in the competition drawings. The details belong for the most part to what may be called the common property of Classical design, but the building considered *en masse* is an original one, and its originality is combined with dignity and a certain common-sense quality which is not an undesirable element in public buildings. We wish however, that the plan of the building had been added. We shall publish an illustration of this drawing next week. The other most important public building design is Mr. Belcher's Colchester Town Hall, which is illustrated in a large and bold coloured perspective somewhat roughly executed (1756), and by geometrical drawings of the details of the tower, with the plan of various portions marked on the elevations (1743). This latter is one of the best pieces of architectural illustration in the room, and the kind of drawing of which we wish to see more examples in the architectural room. In the general view the effect of the three groups of columns each carrying a circular pediment, the whole making a series of features extending from the upper line of the basement to the roof, is very bold and striking; and the tower, with its crowded upper story carried on a plain brick stalk, is very effective. Mr. Belcher also exhibits a large perspective view of the new Guildhall for Cambridge (1734). As in the Colchester Town-hall, the character of the design may be described as "variations on the later English Renaissance." The plan of the façade shows three projecting masses, at the two ends and the centre, the end ones solid, the centre one with open columns; on the ground floor they are connected by a loggia and balustrade defining the general line of the front and uniting the three projecting masses, leaving a large balcony over the loggia. The curious part of the design is the exceedingly bold treatment of the finish to the end blocks, a play of massive rusticated work carrying an immense stone (?) globe which must be eight or ten feet in diameter. We presume these are hollow; externally they present the appearance of enormous terminal ornaments, and though they are certainly open to criticism on the head of scale, it cannot be denied that they have a very bold and striking effect—a kind of detail that one can imagine Vanbrugh would have much enjoyed. Mr. Beresford Pite exhibits the elevation of his competition design for Colchester Town Hall (1751), with plans. The elevation is finely and boldly treated, showing three large arches the whole height of the front, the two side ones forming frames to the grouping of the windows, the centre one being scooped out into a large alcove or apse, within which steps are arranged

on a reverse curve to that of the apse; the effect of this would have been very striking in execution. The upper portion of the tower is treated with a great deal of freedom and play of line. Mr. Brydon exhibits his design for Colchester also; more *rangé* than Mr. Belcher's, but less striking and original (1624). The treatment of the main portion of the elevation is dignified and effective; there are two stories of rusticated wall, with windows; then a deep sculptured frieze, and a more delicately treated upper story with a columnar order. The tower is not very effective, partly from being too much cut up into sections by horizontal string courses, a treatment which weakens the expression of height and verticality. We like to see a tower go boldly up for a great part of its height in an unbroken line, and then develop into an upper stage, the function of the lower portion being to carry this at the requisite height. There are other systems of treating a tower no doubt; it depends partly on the general character of the building; but in general nothing is so effective as the nearly plain stalk with a richly treated upper story. Mr. Brydon also exhibits a perspective view of the Art Gallery and Library at Bath, a Classic building of charming simplicity and excellent proportion of parts, and thoroughly expressive of its purpose. The main block consists of a rusticated ground story with plain circular headed windows, and a rather higher upper story of plain walling, crowned by a cornice and balustrade, and decorated with pedimented niches containing statues; over the doorway is a more important niche flanked by columns and with a segmental pediment above which two seated figures support an escutcheon. The plain square lines of the main block are contrasted by a quadrant curve at the angle, above which is a stage set back a little with an order of coupled columns, and crowned by a small dome. Though the materials are of the simplest, there is nothing in the room more pleasing and satisfying to the eye than this design.

Among the large buildings which are illustrated is Messrs. Gordon, Lowther, & Gunton's Royal Masonic Institution for Boys at Bushey (1632). This may be, and very likely is, a very good building or collection of buildings, which appear to be in a collegiate Gothic style, and to be arranged round one large quadrangle, and one or two other small ones. But this is the kind of drawing which we can see no possible use in exhibiting. It is a bird's-eye view (as usual hung above the level of the eye, which is the way bird's eye view drawings are nearly always hung at the Academy), of small scale as far as the parts are concerned, as the buildings are very extensive, and with no plan. Such a drawing is of no possible value to students of architecture, and perhaps still less to the public. Another educational building illustrated is the Roedan School (1685) by Mr. J. W. Simpson, a very pleasing group of buildings in which, as we find from the block plan, the masters' houses are arranged in the front portion of each return wing and the school-house at the back of the quadrangle (the buildings run round three sides of a square). The open spaces between the houses and the buildings in their rear seem too small. Mr. Basil Champneys exhibits a rather bald-looking line of elevation of the Robinson Memorial Tower at Oxford (whether already carried out we know

showing a row of collegiate dwellings with a tower in the usual quiet Oxford style at one end, and a vaulted entrance in the ground story; the building suits the *cas loci*, but does not present any feature to distinguish it from many other buildings of the same class. The small block plan is very intelligible; the residential portion is divided off into three spaces on each side, which is written the word "staircase" and nothing else. Drawings for exhibition must as well be got up with rather more attention than this.

Among the more important exhibits is a frame of illustrations of various portions of Jardine Hall, the old Scottish house which Mr. May made extensive additions to some time since, including an entire re-drawing of the plan on a very fine scheme; elevation and plan were published in the *Builder* of May 12, 1894. The drawings show a general view of the exterior, the dining-room with a massive wooden ceiling, the staircase, the interior of the spacious *salon-cochère*, and one or two other portions of the house, which as thus altered and enlarged forms one of the most interesting and successful recent examples of domestic architecture on a large scale.

We have diverged for the moment from public buildings, but may return to them in mentioning another and very picturesque Mr. Hare's Public Library, Shoreditch (1888) shown in a very effective drawing by Raffles Davison (who, if we mistake not, is also the artist of the Jardine Hall drawings mentioned). It is becoming difficult sometimes to pigeon-hole designs under special names now, and one does not know how to describe this except that it is a building partially Gothic in feeling and treatment with later Renaissance or Georgian details for the most part. The two rows of tall mullioned windows, with small entablatures over the upper ones and cornices to the lower ones, have a great breadth of effect, contrast well with the mass of plain wall with a pyramidal roof which forms a kind of tower at the end, diversified by a circular turret corbelled out and finishing in an octagonal ogee roof just clearing the cornice. The doorway, with pilasters and a triangular tympanum over, is placed in the lower portion of the *quasi*-tower, from which a bracket clock projects above. The spirit of the design, as an exterior, consists in picturesque character combined with quiet and unobtrusive detail. We have no doubt the plan is a good one, for Mr. Hare rarely fails in that respect, but his exhibit would have been much more valuable if he had allowed visitors the opportunity of studying the plan also. We have been obliged to confine ourselves in this article to commenting on some of the more important and prominent drawings; as there is no opportunity of seeing the Academy catalogue in hand, till the Wednesday, there is rather short time left for going into the subject. In one or two future numbers we shall have more to say.

A NOTE ON THE COMPETITION SYSTEM.

THE paper read by Mr. B. Creswell at the Architectural Association last week, and reported in full on another page, is a very spirited one, and represents very ably the case against competitions. Any one who is reading a paper with the object of attacking

a system is bound, of course, to take more or less the attitude of a prosecuting counsel; so to marshal as strongly as possible all the facts that can be adduced in support of his views, and ignore the arguments on the other side. Mr. Creswell may not have intentionally done so, but it is the natural result of writing a paper to attack a system.

We should at once admit that a great many small buildings are put up to competition which are not worth such a sacrifice of the architect's time. In fact, some people seem to have got the idea that a competition is the natural and proper way of procuring an architect's design for any and every kind of building. A correspondent wrote to us only a few weeks ago to the effect that he wanted to make additions to a house, and what was the usual course—was it not to put it up to competition? This is an exaggerated instance, but the mania among small corporations for having competitions for every little school or hospital they want to erect is absurd and mischievous—perhaps more mischievous to the promoters of the competition than to the architectural profession; for no architect of good position will enter into these competitions, and the corporations who promote them thereby shut themselves out from having the services of the best class of architects and condemn themselves to be served by inferior men. In many cases too, these small competitions are got up mainly for the amusement of the borough authorities or to make a show of impartiality, when in reality it is an understood thing, behind the scenes, that the commission will be given to some favoured person who is lying in wait for it. And this kind of procedure is absolutely immoral.

But in the case of large and important buildings there is a great deal to be said on the other side. Mr. Creswell argues that the system is inimical to art. It was not thought to be so in Italy in the Renaissance period, it is not thought to be so in France at this moment; and France, taking things all round, is certainly the most artistic nation of the present day. In France, not only buildings but decorative paintings for their adornment, and in many cases sculpture for public monuments, fountains, &c., are made the subject of competition among artists; and we have not heard that the French artists dislike the system. It means with them "la carrière ouverte aux talents," a sentiment which has had a charm for the French mind ever since the days of Napoleon. But generally speaking, in France there is a sketch competition first, and three or four of the best out of that are selected for the final competition. It has been said in this country that a sketch competition for architecture is worse than a single one, as it is only giving the competitors double trouble. That is to a great extent the fault of the competitors, who will try to outvie each other by sending highly-finished sets of drawings where only sketches are asked for, and where the assessor (for we are assuming his existence) can form a judgment just as well from a rough sketch as from a finished drawing on a small scale. The system of a limited competition by invitation does away with one of the real advantages of competition—the opportunity for a man of talent who is not known; an advantage which is almost as great to the promoters of the competition as to the architect.

It appears to us, therefore, that for important buildings the influence of the competition system is beneficial and not prejudicial to art. When properly and honestly carried out, it is a means of getting at the best that can be done; it stimulates an interest in architecture; it may lead and has led to the execution of a fine design by a man who would have had no chance of the commission except in a competition. And even those who produce a good design which is unsuccessful have not lost everything; they have had some enjoyment out of it (for we quite agree with Mr. Pite's spirited defence of competition in this respect), they have gained some new development of their own powers, and they may gain indirectly a great increase of reputation as the author of a good though not of the best design. All these are points well worth consideration to the credit side of competition.

Mr. Creswell urges that under this system we put up architecture to the judgment of ignorant persons, but he admits that the appointment of a professional assessor has now become the rule rather than the exception in important competitions, which is partly an answer to that argument. The weak point in regard to a single assessor is that, though able and impartial, he may have strong proclivities of architectural taste, and that design will seem best to him which accords with his own preferences as to style. In France an important competition is often decided by a jury of two or three architects, which is of course much better; but we should imagine that in that case the exercise of the office must be honorary. The suggestion has been made that it should be so in England—no more fees for the assessors: partly on the ground that assessors would in that case be always employed. The architectural profession can, however, compel the employment of the paid assessor by unanimously refusing to compete without him. The change might be an advantage if we could then have the French jury system instead of the single assessor. With the single assessor system the assessor must be paid, as it is assumed that he must be a prominent man, whose time is therefore valuable, and who could not possibly afford to give the requisite time to studying a large number of designs as a labour of love.

NOTES.

ALTHOUGH the dispute is still unsettled, and there are no immediate prospects of peace, the suggestion made on Monday in the House of Commons by Mr. Ritchie is admirably calculated to clear the way to a conference between the contending parties. The difficulty at present is that the men have declined to entrust their representatives with plenary powers; a state of things which, the colliery-owners rightly argue, would render a conference of little or no avail. Mr. Ritchie's very sensible and practical proposition is that the men should choose a body of delegates with powers to settle on their behalf, who should be in attendance for consultation during the negotiations between the committees of employers and employed. The President of the Board of Trade points out that if this were done the workmen's committee would not be empowered to effect a settlement but they could consult with and obtain

authority from the delegates. Thus the spokesmen at the conference would be in the position of a solicitor with his client within reach to authorise or veto any proposed course of action. The question of the regulation of wages in the future forms another obstacle to an early settlement of the dispute. The employers naturally wish to come to some arrangement before resuming work; whereas the men, in pressing for an immediate advance and resumption, are unwilling to discuss a new sliding scale or any alternative system. It is to be hoped that a settlement may be arrived at which will obviate the risk of a reopening of the dispute at any moment.

Westminster Improvement Scheme.

THE rejection of the Bill for the Westminster Improvement Scheme on Tuesday was almost a foregone conclusion, after the public feeling which has been manifested with regard to it. The promoters might have found more favour with the Government if they had shown a different spirit and a better method in first setting their scheme before the public. But their first proposed block plan showed such an almost cynical contempt for every consideration except that of getting the most money out of the ground, and such an absolute ignorance of or indifference to considerations of architectural effect, that a prejudice was created against them at once; and their rushing thereupon into the arms of Mr. Norman Shaw to receive the consecration of æsthetic taste at his hands was a move made too late, and too obviously as a mere matter of policy, to do away with the effect of their first announcements. But for this blunder at the outset, they might have got their Bill into Committee; but it is perhaps better as it is. To give such great powers for public improvements into the hands of any private company is rather a dangerous precedent.

The Westminster Catastrophe.

THE collapse of the concrete roof over Abbey Mansions, Westminster, is a serious matter, and it is important that full information should be elicited as to the cause of it—whether it arose from faulty principle of construction, bad material, or careless workmanship. No doubt evidence in regard to this will be forthcoming at the coroner's inquest, which is adjourned till May 9. We shall publish an illustration of the building next week, when Mr. Pawley, the architect, has promised us full information as to the structure of the roof.

Responsibility for Sewage Effluent.

AN important action was decided in the Queen's Bench Division on Saturday last by Mr. Justice Grantham and Mr. Justice Kennedy. It appears that on December 7, 1897, the High Wycombe Gas Company passed into the sewers of the district a large quantity of very offensive liquid, containing "liquid ammonia," and that no special means were adopted by the officials of the High Wycombe Corporation to purify the sewage containing this objectionable matter on its arrival at the sewage-irrigation works; in consequence, the sewage effluent, which was passed into the Wye, a tributary of the Thames, was so foul as to kill "a large number of fish" in the Wye, and, of course, polluted the Thames. The Thames Conservators at once took

action, not only against the Corporation, but also (and, we think, wrongly) against the Gas Company; in both cases the defendants were fined. Against this decision of the local magistrates the Corporation appealed, with the result that their appeal has been allowed with costs, and the conviction by the magistrates has been quashed. This is a curious decision, and dangerous. The judges appear to have supported the Corporation because the offence with which they were charged "was at best a mere error of judgment on the part of their officers;" but surely a master is responsible for his servant's "errors of judgment" while engaged in his service? In this case, too, we are strongly of opinion that the conviction of the Corporation should have been upheld. If it is to be held that every manufacturer turning refuse into a sewer is responsible for the failure of the Sanitary Authority to purify the sewage, it will lead to endless confusion, besides shifting the responsibility from the Authority whose business it is to see to the adequate purification of the sewage. Mr. Justice Grantham said that the case was "anything but free from difficulty," and was "very near the line." We think that his decision is over the line, and that it will be dangerous to allow it to become a precedent.

The Light Railway to Exmoor.

THE opposition to the proposed light railway from Minehead on to Exmoor is, like that to the recent attempt to run a new line in the Thames Valley, of more than local interest. It is to be observed, in the first place, that the Light Railways Act was passed with a view to agricultural produce being more easily delivered at large centres of population. The present line is proposed for the purpose of excursion traffic. It was also intended that light railways should be promoted by the inhabitants of a district. The intended line is promoted by persons from a distance, and is opposed by the local people. It is clear that the population of England is now so large that it is a great temptation to company promoters and railway companies to arrange schemes so that hundreds of excursionists may be unloaded in certain places for a day only. It becomes more necessary, therefore, every year, for those who desire that some districts, at any rate, should be preserved from these barbaric incursions to take care that the schemes of railway companies are carefully watched. We have not the least wish that the working population of the country should not have their day's outing, but picturesque districts should not be spoilt by the inroads of people who can enjoy themselves just as well, or even better, in other places.

Acetylene at the Imperial Institute.

ON June 1 next it is intended to open an exhibition at the Imperial Institute of appliances for generating and burning acetylene. The exhibition will be open to the public free of charge daily from 11 a.m. until 1 p.m., but from 1 p.m. to 11 p.m. a charge will be made. Wednesdays will be reserved for the admission of Fellows of the Institute and their friends. The Council of the Society of Arts has appointed a Committee to settle the conditions under which exhibits will be admitted. The Committee consists of the following members:—Major General Sir Owen Tudor Burne, Sir Frederick Bram-

well, Professor James Dewar, Mr. H. E. Jones, Professor Vivian B. Lewes, Mr. Boverton Redwood, Professor W. Roberts-Austen, Professor J. M. Thomson, and Sir H. Trueman Wood. The Committee will test all generating apparatus before admitting it to the exhibition, but the admission of a generator to the exhibition will merely show that it is considered by the Committee perfectly safe for use at the exhibition, and will not imply that the Committee recommends the generator for general use. The carbide will be that manufactured by the Acetylene Illuminating Co., at Foyers (Scotland), who are at present the sole makers of calcium carbide in Britain. Exhibitors will be allowed sufficient carbide to supply a seven-light gasifier for a period averaging not more than five hours per day, and each burner must not consume more than one cubic foot of acetylene per hour.

Electric Tramways and Water Mains.

THE paper read on the 21st inst. by Mr. Parshall at the Institution of Electrical Engineers was an excellent contribution to our knowledge of "earth returns for electric tramways." When the rails are employed in a tramway system to return the current to the dynamos, the Board of Trade insist that the difference of pressure between the two extremities of the line must be less than seven volts. It therefore came as a surprise to those present when Mr. Parshall said that from measurements he had made on a tramway eight miles long he found that only 40 per cent. of the current came back through the rails, the other 60 per cent. coming back through the earth. In other words, the drop in pressure was less than half what it would be if all the current came back through the rails. Electricians were reassured, however, when the author said that the stray currents at this low pressure showed no tendency to be diverted to gas or water mains, but merely went through the ground itself. In places where the earth was a bad conductor he recommended that the return conductors be isolated as much as possible from all other metal conductors likely to be affected by electrolysis. He advised that from several points on the rail "feeder mains" be taken and the current collected from the rails by means of these mains, thus preventing great currents from flowing in the rails and leaking to earth. He pointed out that when rails of high conductivity were used, they wore away very rapidly. It was better to use harder steel and to use "feeders." Tables of interesting and accurate tests on the various kinds of bonds used in addition to the fish plates for connecting the steel rails were given, and the loss at the bond was cleverly analysed in its various component parts.

Liskeard Church Tower.

THE Liskeard tower matter seems to have ended in a compromise which will probably satisfy no one. It is to be rebuilt after all as far as we can gather from the rather confused report of the proceedings at the special Vestry meeting last week, but on a smaller scale than was originally intended for the proposed new tower, and on a design which it is said "will harmonise better with the church." We hope it will, but the object was to save the old tower; that seems to be doomed, while on the other hand the destructive party, on

whom at the Vestry said that the people who had been insulted and treated as "puppets," have not got anything to satisfy them. Altogether the result seems unfortunate, though it is possible that the tower proposed (we have not seen the design) will be less of an architectural interloper in the district than the one for which the money was promised.

In a "Note" in our last number (p. 387, *ante*) we mentioned the watch-box which, until a few days ago, stood against the front wall of Messrs. Barclay & Co. have refused any offers to purchase the relic, which, we believe, is the last of its kind that remained in the St. Marylebone Court-house. The watch-houses, too, are disappearing likewise, and only two or three have survived to our own day. The largest is in Marylebone-lane, now forming part of the St. Marylebone Court-house. The east door is a coat of arms, having an angel and a lion rampant for support, and with a coronet, all finely modelled, each which is "A.D. MDCCXXIX." A further tablet is inscribed:—

ST. MARYLEBONE WATCH HOUSE
REBUILT A.D. MDCCCV.

Collingwood-street, and adjoining the churchyard of Christ Church, Blackfriars-lane, stands the "Watch and Engine House," now a mission hall, bearing an inscription stating it was built in the year 1819; there is another adjoining the end of St. Sepulchre's, Holborn, and in 1791, near the site of the old St. Stephen's chapel of that church. The watch-house in a corner of St. Botolph's church-lane, Bishopsgate Without, latterly converted into a shop, No. 201A, in the main street, is commemorated by a tablet in its wall:—

This Watch-House was Rebuilt Anno Domini 1819, JAMES TOWNSEND, Esq., Alderman.

That in the churchyard of St. Anne's, was adapted for purposes of a mortuary. The original St. Giles's watch-house stood in High Holborn, at the end of New-street; the later one, known as the parish house and House, near the west end of St. Giles's church, was taken down in 1690; its successor in the Coal-yard (now Goldsmith-street) adjoining Barley-court, was finally pulled down in 1884 for the erection of new almshouses; the inscribed tablet has been preserved. A nightly watch for London was established in 1253, and continued, under various local Acts, until 1829 when, in pursuance of the Act 10 George IV., c. 44, the local police and watch outside the City, together with the Bow-street foot patrol, were superseded by the present force on a system which V. G. Dowling, editor of *Bell's Life in London*, claimed to have originated.

Metropolitan THIS building, destroyed by fire on the 20th instant at an estimated total loss of 35,000*l.*, was erected by subscription for the late C. H. Spurgeon in lieu of the hall at Old Surrey Gardens, upon what had been the site of the Fishmongers' Company's shouses, at Newington Butts.* In February, 1859, the competing architects' drawings (sixty-two sets and one model)

The almshouses, or St. Peter's Hospital, built in 1668 out of the Knesworth (1513) and other trusts, had courts, a chapel, and a hall; they were rebuilt, at East Hill, Wandsworth.

were exhibited in the neighbouring Horse and Carriage Repository. By a vote taken amongst themselves about forty of the competitors assigned the first premium to Mr. E. Cookworthy Robins, of whose designs a perspective view will be found in our volume xvii., March 19, 1859. The committee, however, gave their award to W. W. Pocock, and the fabric was erected, though with some ultimate modifications, including the abandonment of the four turrets, after his designs as illustrated (view and plan) by us on March 26 of that year. The competition gave rise to a great deal of correspondence in the *Builder*, see vol. xvii., from some of the competitors and others. The estimates amounted to 14,954*l.*, and thirteen tenders ranged from 26,370*l.* to 21,500*l.*, with 593*l.* for earthwork and drainage. The Tabernacle, costing, it is said, 32,000*l.* in all, measured 140 ft. by 80 ft., and 60 ft. high. It had a capacity in the ground floor and two surrounding galleries of 5,897 persons—standing room included. A conference hall, class-rooms, and other offices were subsequently added. It is surmised that the fire, first noticed in a corner of the upper gallery just above the main entrance, was occasioned by the overheating of a flue from the kitchen in the basement.

THE Committee of the Marylebone Cricket Club are acquiring gradually the property around the north and west sides of their cricket ground. Last year the house and large garden of what had been the St. Helena Home were added to Lord's. During the past winter the M.C.C. have acquired No. 3 ("Duncroft House"), Grove End-road, and No. 22 ("The Vines"), Elm Tree-road. They intend to pull down the tennis-court fronting St. John's Wood-road, together with the adjoining racquet-court—mostly rebuilt in 1875—and the adjacent block of two houses, up to the south-east gates, and to build new tennis and racquet courts on the freshly-acquired site behind the pavilion. Thus the old tennis-court, whose clock-dial and creeper-clad walls have for long been a familiar feature of the ground, will give way to another great mound for spectators' seats.

An appeal has been made in the Press for a subscription for a memorial to the late Sir F. Lockwood. The objects are the endowment of a bed in a London hospital, an erection of a memorial in York Minster, a brass tablet in St. Margaret's Church, Westminster, and a portrait to be offered to the National Portrait Gallery. It is with the last only that we are concerned. No one doubts that Sir F. Lockwood was an able legal advocate, and a deservedly popular man, but it is equally certain that he would have been the first to admit that he had not attained the importance in his day which would justify the admission of his portrait to the National Portrait Gallery. That Gallery should be confined to the portraits of persons of historic importance, of men who have left a mark on their epoch. It is already full, and if every popular or eminent lawyer is to have his portrait placed there it will soon be necessary to double the Gallery in size. The idea of placing Sir F. Lockwood's portrait there is another instance of the modern idea which seems to

consider almost every man who has risen above the ruck to be worthy of a biography. We hope, therefore, that the Trustees of the National Portrait Gallery will refuse any offer of the contemplated portrait—a refusal which would in no way be a denial of the many charming qualities possessed by the late lawyer.

THE studies are in progress for the 1900 Paris Exhibition. a "Château d'Eau" on a grand scale, which is to occupy, at the Paris Exhibition of 1900, the place lately occupied by M. Bouvard's dome for the 1889 Exhibition, now demolished. The base of this monument will be eight metres above the level of the soil, it will be reached by a circular staircase of 150 metres in length, bordering the cascade. On the centre piece of the cascade will be a group symbolising "l'Humanité conduite par le Progrès et s'élançant vers l'Avenir." The decorative details will be in the style of the Louis Seize epoch. There are to be alleys adorned with fountains radiating from this central object.

THE NEW GALLERY EXHIBITION.

We read in some of the daily papers that the New Gallery has never had an exhibition of greater and more varied interest than the present one. It seems the fashion to say this of the New Gallery, just as it is the fashion to run down the Academy; in fact one is sometimes tempted to think that the Press notices of the New Gallery are written in collaboration with the Committee or the exhibitors, or at all events that the critics are *amis de maison*. The exhibition contains some remarkable portraits; in other respects it can hardly be said to contain any picture which is really of the first order, and it includes a great deal of work that is mediocre and uninteresting, and some that is very bad.

The salient figure pictures, other than portraits, are Sir E. Burne-Jones's "St. George" (141), Mr. Watts's "Early Spring" (113), and Mr. John Collier's "Godiva" (240). The first-named is a very well-executed painting of a girl of the sad-faced and long-chinned type which the painter has familiarised us with, dressed up in a picturesque and beautifully painted suit of armour, to represent St. George. That is the only reading one can give of the picture; the figure is not a man, still less a knight; his face differs in no respect from that of the Burne-Jones woman, and one feels irritated and rather contemptuous at seeing this epicure creature offered to us as a symbol of knighthood and courage. Think of Donatello's St. George, and compare it with this conception! Mr. Watts's "Early Spring" is a painting of a little child, barelegged, in a white frock, in the middle of a wood with a bunch of flowers; the head is beautiful both in colour and expression; the legs and feet much less delicately treated and hardly seeming to belong to the face. But on account of the head this will take its place well among Mr. Watts's child figures. Mr. Collier's "Godiva" is a less common-place and more refined treatment of this hackneyed subject than we generally see. He recognises, of course, what painters have usually overlooked, that ladies in those days rode astride like men; he gives us a "side elevation" of a splendid grey horse richly caparisoned, and the lady seated in a velvet saddle, her head bowed forward and her long hair gathered over her bosom with one hand. The proud action of the horse is purposely contrasted with the meek resignation of his rider; that is evidently a point of the picture; but Godiva's distress is not very poignant; the picture is only sentimental, it might have been pathetic. In the brilliant texture of the horse's neck there is a little too much suggestion of a very well executed rocking-horse of the more elaborate and expensive type.

Among the other prominent figure-pictures Mr. Jacob-Hood's painting of an Italian woman and child "In the Shade of the Vines" (19) is surprisingly academic for a painter who is usually so vivacious and original, and is a disappointment. So, to some extent, is Mr.

Abbey's carefully composed work "A Poet" (39); a kind of Decameron scene where the poet, in long nearly white drapery, declaims to some ladies on a terrace in front of a mass of dark richly-limbed trees through which a flight of stone steps leads up to the "back scene," as one may say, for the whole thing is rather theatrical. The composition as a whole is striking, but the individual figures are not as interesting as one would have expected from Mr. Abbey. Mr. Walter Crane's allegorical painting "The World's Conquerors" is only of value for the moral, which we could have in poetry better than in painting. Mr. G. Harcourt's large painting "Too Late" (253) is a piece of commonplace on a large scale, and below it Mr. Holman Hunt's head called "The Beloved" (255) is something absolutely painful to the feelings as well as to the eyes; it is intended as a pathetic head of Christ, and is little better than a grotesque. Mrs. Swynnerton's ideal figure representing "St. Martin's Summer" (156) is hardly a success; it wants the element of beauty which is the real *raison d'être* of a subject of this kind. The artist has however succeeded at all events in producing an effectual puzzle for the ordinary picture-gallery promenader, as was amusingly evident—"But what does it mean?" "Why do they do it?" &c. In fact, the picture is perfectly intelligible and justifiable if it had only more beauty; but we cannot say the same of Mr. Watts's "Can These Bones Live?" a work which, from the point of view of the art of painting, is perfectly unjustifiable.

"Can these bones live?" is a question that might be applied to the pseudo-medieval pictures which as usual find place in the gallery, such as Sir E. Burne-Jones' "The Prioress's Tale" (82) and Mr. Strudwick's "Even-song" (75). These are works of a kind which are dead already; affections of archaism, quite wrongly applied to Chaucer, who was a most wide-awake poet of his day. Nor, for another reason, is there promise of life in Mr. Boughton's "When the Dead Leaves Fall" (116), a figure pretty but devoid of life or reality. One turns with more pleasure to some smaller and less pretentious works; Mrs. Tadema's lively little "Impromptu" (79) and the small portrait of "Lady Waterlow" (86), laughing with her sunshade across her knees. Miss Gow's pretty symphonies in white of mother and child (232, 241), and Mr. Lemon's clever realisation of Don Quixote and Sancho. "The Discovery of Mambrino's Helmet" (66). These at all events do not "affect the obsolete."

The portraits, some four or five of them at least, are in one sense or another the most notable things in the collection. One west wall of the north room are the four most conspicuous ones. Mr. Shannon's "Mrs. Harold Burke" (188) is a perfectly artistic combination of flowered dress, soft, elaborate paper or stencilled wall pattern, amid which the face of the personage seems a little eclipsed, but the picture is an artistic and harmonious whole. Next comes Mr. Byam Shaw's portrait (192) of a young lady in walking dress, planted rigidly on the centre line of the canvas with her back to a very showy gold wall-pattern, against which the figure is relieved in the most crude and materialistic manner; the walking-jacket and the skirt making two successions of harsh straight lines widening out to the base; if we overlook the break made by the junction between skirt and walking cloak, we might compare the whole figure to an acute isosceles triangle set upright on its base. This is a kind of portrait that every one looks at because it is so odd-looking and so obtrusive in its lines; but it is not an agreeable work. Then follows Mr. Sargent's charming and most dramatic portrait of "Mrs. Thursty" (200), a lady seated with bright eager expression and an attitude as if just about to rise up from her chair to give more emphasis to a repartee. One has seldom seen a portrait more full of animation than this. Then comes the large work by Mr. Arthur Melville, the artist who paints in dots and blot at the Society of Water Colours, and who has painted the portrait of a lady (207), with an immense expanse of silk dress which looks as if it were dashed on with sponges or a large house-painter's brush, and a face which must surely be a travesty. There is a great deal of cleverness in this, but it is pretentious, violent, and ugly. On the same wall is M. Carolus Duran's brilliant half-length of a young girl, a child (196) with glancing lights on her hair and face, a picture a little

hard, but a truly charming work nevertheless. It is interesting to compare this portrait, so redolent of modern life with Mr. Watts's fine picture called a portrait of Mrs. Ivo Bligh (91), one of the painter's allegorical figures, with their peculiar colouring, richly dressed in a modern costume, but which does not at all suggest the portrait of a modern lady, though it is a very fine work in itself.

There are no landscapes of the highest rank. There is a large and rather powerful one by Mr. Reid (189) which a little too much suggests a leaf out of Constable's book, and a work by Mr. East, entirely different from his usual manner, "A Mystic Pool" (218), a kind of idealised landscape of rounded hills, masses of rich warm woodland and of ivory white cloud; and in the foreground a pool nearly lost in a tangle of thicket in a dark hollow; two nude nymphs, dimly seen, look out through the boughs. The landscape is hardly nature, but it is a fine poetic conception founded on nature. Mr. Adrian Stokes has done himself no justice in "The Cross in the Forest" (92), a poor piece of sentiment without much work in it; Mr. Peppercorn's "The Common" (136) is a picture with a unity of treatment about it, a fine and solemn sentiment, somewhat marred by a very dirtily painted sky; and Mr. Arnold Priestman's "Sundown" (145) is a fine work which looks as if it had claims to have been better hung. Mr. Edgar Willis's "Twixt Day and Night" (191) is a good study of twilight effect; in "Arcadia" Mr. Leslie Thomson has produced a very pleasing kind of pastoral poem in combining trees, bank, and water with rich lights and reflections, with the nude forms of a group of girls bathing or grouped on the bank, half seen in the shadow, so that the whole is idealised in a manner in keeping with the title given to the picture. Mr. Olivier's "A Garland Greeting" (62) is a combination of landscape and figures which may be compared with this, though with a very different technique; here the figures are clothed, but are people of an ideal world nevertheless. Among other smaller works may be mentioned Mr. Hartley's "On the South Downs" (5), only a shoulder of hill and clouds; Mr. E. Stott's "Gleaners" (20), a fine piece of autumn colouring; Mr. Parsons's "The Back of the Village" (35); Mr. C. W. Wyllie's "Moonlight over the Marshes" (153); Mr. Parsons's "Larkspur and Roses" (149), a garden scene with an old gate beyond; and two or three pictures in which architecture plays the prominent part—M. René Billotte's "Ruines" (6), and "Vieux Canal à Dordrecht" (143), both good, and Mr. Logsdail's "The Market Boat" (139).

The one architectural drawing proper in the exhibition, as usual, is one of Mr. Robson's, a perspective view of "Proposed Public Buildings, Cheltenham" (429). If architectural drawings in general are tabooed at these exhibitions, one can understand why an exception should be made in favour of the original architect of the building; but we do not understand why no others should be admitted.

The sculpture is not very important as a whole. Mr. Taubman's bronze group "Rescued" (464), apparently represents the saving of a woman from a wolf by her hunter-husband in the iron age; it is spirited, but not very sculptural in line. Mr. Mullins exhibits a prettily-composed group of two "Sisters" (462), an adult and a child; Mr. Onslow Ford an excellent likeness (bust) of Sir C. Hallé; Miss Emmeline Halse a pretty miniature wax sketch of "Waterbabies," and Miss Rope a charming little bas-relief of children dancing. The most new and original among the larger works is Mr. G. Cowell's "Tired" (458), a bronze of a nude boy leaning back against a decoratively treated wall with hands spread out on either side, and holding apparently a skipping-rope which drops in a curve behind the figure; the head is on one side in an attitude of sleep or drowsiness. This is a pretty work, but the attitude and what they call on the stage the "business" seem more suitable to a girl than a boy.

NEW TRAVELLERS' CLUB, PICCADILLY.—It is announced that in the course of next week all the furniture and effects of the club will be sold by auction. The club-house, at the south-east corner of Whitehorse-street, was built seven years ago, by Messrs. Alfred Bush & Sons, contractors, from the plans and designs of Messrs. Thomas & Frank Verity. We published a view of the premises taken from the south-east in our number of October 15, 1892.

THE ARCHITECTURAL ASSOCIATION: THE MORALITY AND ECONOMY OF COMPETITIONS.

A MEETING of this Association was held on Friday evening last week in the Meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. Hampden W. Pratt, President, in the chair.

The minutes of the last meeting having been read and confirmed,

Mr. G. B. Carvill, junior hon. sec., proposed a vote of thanks to Mr. F. B. Wade for admitting members to visit Lord Windsor's house, Mount-street, and also to Messrs. Spalding & Cross and Mr. H. T. Hare for permitting members to visit the Shoreditch Public Bath and Free Library, and to Mr. E. J. Wakeling, J.P., for conducting the party over the bath. The votes of thanks having been carried,

Mr. E. Howley Sim, senior hon. sec., said he wished to remind members of the soirée to be held at the Café Monico, Piccadilly-circuit on Friday, the 29th inst.

The Chairman announced the commencement of the following classes:—Mr. Westcott Water-colour Class, on Saturday, May 7, 2.30 p.m.; Mr. A. O. Collard's class on Professional Practice, on May 2, at 6.30 p.m.; at the Sketching and Measuring Class, at South Kensington Museum, on May 3, at 6 o'clock.

Mr. G. B. Carvill announced that the next Spring visit would take place on Saturday, May 7, to the New Crown Theatre, Peckham, by permission of the architect, Mr. Ernest Runtz. The last visit of the session would be on May 21, to the new Tooting Hospital.

The House List

The Chairman then read the House List for the coming session, as follows:—President, Mr. G. H. Fellowes Pryme; Vice-presidents, Mr. P. J. Marvin and Mr. A. S. Flower; Committee Messrs. T. W. Aldwinckle, jun., R. S. Balfoir, A. Bolton, F. D. Clapham, H. B. Creswell, B. F. Fletcher, M. Garbutt, A. H. Hart, W. Hopkings, J. Murray, E. H. Parkes, Beresford Pite, W. A. Pite, H. A. Satchell, W. H. Self Smith, H. D. Wilkinson; Hon. Treasurer, Mr. Hampden W. Pratt; Hon. Librarian, Mr. C. H. Freeman; Hon. Secretaries, Messrs. J. Howley Sim and G. B. Carvill.

Hon. Auditors, Messrs. H. P. G. Maule and J. W. Stonhold; Hon. Solicitor, Mr. W. Jamieson; Assistant Secretary and Registrar, Mr. D. G. Driver.

The Chairman said that any two members could make other nominations at the next meeting of the Association on May 6, but that must first obtain the consent of the gentlemen they nominated.

Mr. B. Creswell then read the following paper on "The Morality and Economy of Competitions":—

Some two years ago I had the honour to contribute to *Architectural Association Notes*, the organ of this society, a series of articles, in which the subject of architectural competitions was lightly touched upon. Certain figures relating to the number, value, and dimensions of public competitions were assumed as fairly approximating to the real ones, and it became manifest that the competition system, when viewed from the basis afforded by these figures, was irrational in the extreme. In spite of the popularity of competitions, it seemed that the whole fabric of the constituted for the profession an inconceivable folly, and accordingly the results and conclusions ensuing from these assumed figures appeared incredible; but as these figures were certainly within the limit of fair supposition, and probability, it struck me that if the actual statistics could be obtained and exhibited in their true significance, our competition system could be demonstrated to be at once futile and disastrous, both to the interest of the profession and to the art of architecture, and the system accordingly fall to utter disrepute. I was quite unaware that as early as 1838 a special committee of the Institute had investigated the matter in detail; and that twenty years ago the same idea had urged the late Mr. Thomas Porter, a Fellow of the Royal Institute of British Architects, to proceed upon the same lines that had been laid down for this paper. I found I had elaborately taken my apple-cart to an orchard where the trees were already stripped. Mr. Porter made an exhaustive investigation of the facts and figures relating to competition, and, by general admission, clearly demonstrated and established the futile and disastrous character of the system; but, so far from h

ations bringing competitions into disrepute would seem to have stimulated the voters to new and more extravagant irritations, and the competitors to a keener rivalry. I duly discovered the existence of Porter's elaborate tables only when I got far towards completing just such a set of tables myself, which was to a certain extent unfortunate, because Mr. Porter's figures were most carefully verified and completely established, and prove those points which they deal with and a great deal of my own investigation therefore prove largely superfluous. After this has been said, it would be well to recapitulate the history of the various protests and objections that have been raised against the competition system in this country. I do not know whether the commission to build the new Baptistry of Florence, which was put in competition, was the occasion of protests and objections, but, though it may generally be known, organised and systematic protests against the system date from the early in this century; and, for the better of a hundred years, at least, the voices of zealous architects, defrauded in open common, have been heard in choruses of lament, denouncing the tyranny of rural shopkeepers, combining to make public protest and instruction just as they are to-day. I have seen the following instances and occasions, I doubt there were others which have not come under my notice.

In 1838 a Committee was appointed by the Institute to consider the subject of competition, who, having thoroughly investigated it, and appalled by its difficulties, and contented by publishing a report containing much valuable information, but leaving the remedy much as it was before in the hands of the profession. In 1850 the Architectural Association considered the question and drew up a report containing a code of regulations, which suggested would meet the difficulties of the case. In 1857 Mr. George Morgan read a paper before the Institute upon this subject, which led to a debate, in which everyone agreed again that something ought to be done. About 1860 the "Architectural Alliance" steps to draw up a form of circular suggesting terms of "General Conditions," which sent to such Committees and Councils as desired symptoms of breaking out into competition. In 1871, on the occasion of the General Meeting of Architects, Professor Kerr read a paper on the subject of the competition aspects of competitions. Every one agreed that something ought to be done. A Committee was again nominated and asked by the Congress to investigate the matter and report accordingly. In 1872 this Committee, together with a code of proposed regulations for the conduct of competitions, was before the Congress of that year, and the result was, with one exception, unanimous agreement that something ought to be done. The exception was Sir Edmund Beckett, who made a very able and interesting speech in the matter, as architects may consider, of devil's advocate's advocate.

I may mention here that it is the recommendations made by this report, revised again in 1883 and in 1892, which to-day stand in the Institute Calendar as "Suggestions for the Conduct of Architectural Competitions." In 1881 Mr. Thomas Porter read his exhaustive report on the subject, in which the best that has been said in demonstrating the suicidal folly of the profession in acquiescing in the competition system is there printed and set down. Hearing that paper, everybody was as completely satisfied as they had ever been that something ought to be done. It was a past letter of the Architectural Association, Mr. A. Adams, who the next year did—or nearly did—the necessary "something," drawing up and circulating a memorial which was signed by 1,300 architects, who by bound themselves to take part in no competition save where a "professional adjudication of established reputation was employed." This was presented at the Institute by the late Sir Edmund Street in 1881, when the matter was again discussed. It is indeed a regret that the activity aroused by Mr. Porter's laborious investigations, and the energy of Mr. Adams' energies, should have been allowed to burn itself out without any one, because it was the occasion of revelation of such importance and significance is not likely to occur again, and the failure of this enterprise having failed to any useful purpose, sets the profession in a

much more hopeless position than if the endeavour had never been made. It has to be said, however, that while the Special Committee of 1872 found that professional assessors were rarely employed, I find that in the present day more than half all competitions are benefited by the services of such an assessor. There is no reason to suppose that this is not a direct result of Mr. Adams' memorial. Nevertheless, when such a momentous occasion has wrought such a small benefit, how can we hope other men to interest themselves actively in a reconstruction of the system? Still, as far as one is able to judge, the Institute and indeed the profession in general is as firmly convinced as it was in 1838 that something ought to be done, which is a matter for congratulation. The subject came up again when in 1883 a Special Committee of the Institute was appointed to revise the regulations for conditions of competitions drawn up in 1872, but I am not aware that it has found any prominent or special attention in the fifteen years intervening, so that there seems some reason for the conclusion that the failure of Mr. Porter and Mr. Adams in 1881 has unfortunately tended to relegate the subject to the great limbo of the hopeless causes. But there is hope. We have seen that in 1838 the Institute debated this subject, in 1858, in 1871, and 1872; and in 1881 and 1883 it held debates and read papers on the same subject, and if, therefore, things continue in the world of competitions as they have been doing for the past few years, it seems a reasonable ambition to hope and expect that the Institute will shortly read another paper to itself on the same subject, over again, and draw up some fresh reports and make some more suggestions.

Of the figures which are here presented for the first time, I may say that they have been modified from what was originally hoped and intended of them. It was found impossible to discover the actual number and value of all competitions in Great Britain over such a period as should afford an unquestionable average figure of competitions in any one year, because a large proportion of competitions are only advertised locally. In England alone, I have it on high authority, more than half of all competitions are not advertised or noticed in the professional journals, and from my own investigation it was made clear that both in Ireland and in Scotland the tendency is to preserve and confine competitions to their respective countries, a circumstance for which, under existing conditions, we can scarcely be sufficiently thankful. One is inclined to predict that, if these two countries opened their doors, and our voracity for competitions did not flinch from the new undertaking, the profession would, figuratively, fall limb from limb and rot away.

The figures and facts hereinafter dealt with, therefore, must be regarded as having reference to England only, but even here they are inadequate to give any idea of the magnitude and extent of the system for the already stated reason of the inaccessibility of local statistics.

It should be explained in passing that it is upon the basis of averages that the subject is to be here dealt with. The system has manifest advantages over that in which special cases are enumerated. It is a fairer method, because in dealing with so wide a subject a selection of special cases can be made to illustrate any assumption or point of view, and prove any desired conclusion. It is clear, because it condenses the whole field of the subject to a single representative item, and reduces the whole matter to its vital and primal element. It is absolutely necessary in considering this subject of competition to regard it in its wide and general bearing as affecting the profession and the art, if any profit is to derive from that consideration. To investigate it from the point of view of the individual competitor, and with an eye to his personal welfare or disadvantage, is scientifically absurd, besides being obviously absurd in many other ways as well. There is little doubt that this horrible incubus of competitions which torments the profession, would never have grown to a serious harm if we had considered the matter in its universal and general bearing, and not in its personal and particular aspect. Competitions, therefore, will here be dealt with in relation to the profession as a whole, and a scheme of averages is used as being the most serviceable to that end.

The following figures, which are presented in the annexed table, are the result of a search through the files of the *Builder*, both in the advertisement columns and those of the body of the journal, and cover a period of two

years. As has been explained, they refer to England alone. In the years 1804 and 1805 there are some seventy-one advertised public competitions, or, say, thirty-six advertised in each year. The average value of a building for which competitive designs are publicly invited is 9,000*l.*, so that the value of the buildings whose designs are made in public competition advertised in the *Builder* is about 324,000*l.* yearly. The average value of the First Prize (and premiums may be considered to be always offered, though there are solitary exceptions) is 50*l.*, and besides a sum of 50*l.* is divided in smaller prizes. The average number of competitors I find to be about forty.

Now the cost of making the drawings in a competition of the value of 9,000*l.* may be fairly put at 30*l.* for an average case, being eight drawings at 4*l.* each. This sum does not cover the time of the principal, but the actual cost of producing the drawings. It is true that this cost cannot be at all exactly stated, because the amount of work put into competition drawings varies considerably, for obvious reasons. It is, however, a fallacy to omit in computing this cost, such items as rent, light, and general office expenses, on the ground that they would have been incurred in any case; and it is wrong to consider that, because the principal makes the drawings with his own hand, they have cost him nothing. If he had done this amount of work for some employer he would have been paid, and by doing it for nothing he may be considered out of pocket to the extent of the value of the work. Indeed, he has probably lost more than if he had employed an assistant, because, should he choose to work for his hire, he could command a higher price than what he would pay his draughtsman. The Special Committee of 1872, already referred to, stated in its report that the cost of producing competition drawings (irrespective of principal's time) varied from $\frac{1}{4}$ to 20 per cent., and from 2*l.* to 800*l.*, so that an assumed average of 30*l.* in a competition of 9,000*l.* seems well below the mark. This figure gives an average expenditure by architects of 1,200*l.* upon each competition, or an out-of-pocket loss in each year of 43,200*l.* This, remember, only refers to such of the public competitions of England as are advertised in the *Builder*. I find a slight decrease in public competitions in the last twenty years; but this seems more than balanced by the mass of limited and local competitions.

Gentlemen, I am not going to amplify and emphasize the significance of these figures further. This phase of the subject has already been done to death. But I claim for them that they establish and demonstrate our competition system to be commercially rotten and unsound—that it is irrational; that from an economic point of view it is a monstrous anomaly, and that it is the occasion of expense and extravagances which could hardly be justified even if the policy of the system was shown to be widely beneficial to the dignity of the profession, and the distinction of the art. This, however, is not the case. Our system of competition as a policy is so disastrous to the status of the practitioner and so enervating to the art itself, that even if the economic considerations were satisfactory, and the system beneficial to the pockets of the profession, it could still be shown desirable that the system should either be abolished or entirely reconstructed. This question of policy may be considered quite apart and aside from the economic question, which we have now done with, but it is necessary to explain that the remarks and the conclusions proffered in this and the following columns, do not refer to those large public competitions for valuable and important buildings which are published and discussed by us all; but to the general ruck of competitions, including limited and local competitions, which are here designated and included in the term "our Competitive System." Public competitions for national and monumental buildings, in which the best-established and most reputable of our architects take part, must ever stand in a very different light, and be viewed with a very different sentiment from that which is roused by the wild, tumultuous disorder of the common herd of competitions.

It seems to be assumed by many people that competitions are a means to the end—building. This, of course, is not the case. It is, indeed, conceivable that the noise and excitement of a competition in a small township may stir up and inflate the emulation of the bigwigs of neighbouring towns, and infect with the fever of building those who otherwise might have

remained spotless of the disorder; but this is too fanciful and conjectural to be seriously debated. The fact is that a certain number of buildings will be raised in a given year, and we may consider the existence or otherwise of our system of competitions to have no weight in deciding what that number shall be. This complex mechanism of public competition exists solely to determine which precise architect shall be employed to carry out this or that individual work; and after fifty years of this struggling and grunting and tearing and fighting among ourselves, it is still found that the architects of England have raised England's architecture—precisely the same state of things that would have been effected, without competitions, in peace and goodwill. Our competition system has crowded the profession, and crowded it very largely with ineptitude. In these days we all go in for the grand handicap for premiums before we know how to run. It is a scramble wherein all sorts of unlikely people come in first. The opportunities for a young man to find a standing in the profession by a single stroke of good fortune induces many to enter the profession who would not dare to face the long stern path by which alone success is usually to be sought. They are dazzled by a game wherein success relies so little upon sterling ability, and so much upon the chance circumstances of prejudice and bad taste in ignorant people.

The policy of the system is detrimental also to the art of architecture, as well as to its practitioners; because it effects that the selection of architectural designs shall be made precisely by the class least qualified to form a right judgment. The class who acquire the right of selection under the system—the hanging committee in the gallery of architecture—are not merely ignorant, but they are saturated with the most blatant forms of vulgarity. Our competition system has secured that a large and important division of our national architecture, shall interpret and immortalise the ideals and aspirations of precisely the most degraded and insignificant class intellectually in the country; a class that it is educated in positive ignorance, and cultured in execrable artistic proclivities and tastes. It is not, unfortunately, a case merely of callousness or indifference; the rural Town Councillors of remote England positively select with a rare pains and discrimination the worst designs—not merely or necessarily the most hideous and ineffective, but just those which are most laden with studied assumptions they cannot support, which pretend to qualities above their kind and station, and which cry out their sham importance—precisely those designs which are least fitted to exist, which most insidiously degrade and pollute the morals of all who pass beneath their walls. The customs of all who pass beneath the portals of all who pass beneath the terms of the ennobling influence exerted upon the mind of man by true and refined architecture of lofty aspirations. If this be a just and true estimate of the potency of architecture to influence and modify the ever-changing moral tendencies of a people, and I do not think many will dispute it, we are entitled to apply the reasoning to the other side of the picture, and turn our attention to the false and mean qualities which characterise the greater part of our architecture. What horrors of infamy then do we not see being daily inculcated at our street corners, gentlemen, and what iniquitous deeds must be those performed in the trades of our bricklayers, masons, and carpenters. And of these insidious stimulants to moral degradation which are daily rising inch by inch throughout the country some of the most evil-intentioned are those raised in public competition. The influence of these to undermine the pure motives of humanity in those whose life is spent under their shadow is the stronger and the more to be deplored, since the buildings hold a significance in being for the most part public buildings, the property of the township. The sermon of these stones is preached from an authorised pulpit. It is sufficiently melancholy that that class which, as has been said, is cultured in a positive ignorance of matters relating to art, and which is permeated with the undignified instincts and ambitions of small trade, should hold the privilege of perpetuating these deplorable instincts and ideals in the majority of the public monumental buildings in England; but it is a great deal more melancholy that architects (in acquiescing in a system of competitions which grants these unfeeling creatures the choice of some forty designs) should have added the privilege that enables them to secure a design

which portrays their own meagre commercial instincts and their motives of brag, assumption, and self-advertisement much more thoroughly and effectively than they could reasonably have hoped to obtain from a private architect. It is true that an assessor is most usually appointed, but it is certain that he has little authority with the average Town Council upon a question of design, and nearly all conditions of competition expressly state that his award is not held binding upon the promoters, as will be shown hereafter. The tendency of our deformed system is to secure that a great deal of architecture is soundly and thoroughly vile, which otherwise might have been merely weak and poor.

In view of our own unfortunate condition, it is curious to read of the architects of Belgium who, in and about the year 1887, were desperately concerned to secure this same usage of public competition which we would now be quit of. I am not aware whether the Belgians succeeded in grafting a system of competition on their public, but one would imagine that if the typical Belgian grocerman has any qualities in common with the British grocerman, that there was little enough difficulty about it. The traditions of the profession in Belgium had been opposed to competition. However, the "Central Society of Architecture" at the outset decided that "if competitions were to give good results, they should be properly organised," and upon this understanding it is interesting to notice the recommendations on behalf of the policy of competitions as stated in a paper read before the society in 1887. "The advantages of the system," said the speaker, "are thousandfold. It enables artists to make their talent known. It does away with favouritism. It is an arrangement essentially moral, equitable, and just. It permits the inclusion of all ideas, ancient and modern. All schools, Gothic, Renaissance, Classic, may be set before the public and their value known. A constant emulation is provoked; it stimulates travel and study, and gives all a legitimate right to see their efforts crowned and their talents recognised."

These, gentlemen, are the terms in which a brother architect has advocated the policy of a properly organised system of competitions; but if we put our own system to the test of these various recommendations, we shall find that so far from showing the advantages of our system, the disadvantages are proved. Our competition system assuredly does not do away with favouritism; we have abundant evidence to show that it provokes it. A set of competitive designs is an assurance to the promoters that their favourite is not incompetent; he has shown up with the rest. It is an arrangement essentially neither moral nor equitable nor just. It may certainly permit the inclusion of all ideas, both ancient and modern, and, for the matter of that, demoniacal as well, but the system allows and indeed promotes a lax and unreserved treatment in design, and in this country it is restraint and not freedom that had just now best to be promoted. A constant emulation is indeed provoked, but it is not an emulation in knowledge of style, or power of true expression, but in a smart, taking, meretricious knack of design. Lastly, it cannot fairly be urged as a recommendation to our competition system that it enables artists to make their talent known. There are men of proved quality who have found their opportunity in competition, but it still remains to be shown whether they would not have established their ability just as effectively and as effectually had they abstained from competition, as Pagin, Nesfield, and Mr. Norman Shaw have done. There are many notable instances of men of the highest reputation who owe nothing to competitions, and some who have altogether abstained from them. There is a general approval of competition on the ground that they give young men an opportunity of showing their worth. I have heard them called "the young man's friend," a touching phrase, which, however, lost in pathos from being employed by a young man who wins competitions. As, however, a young man must look to compete forty times for every first award that he may rather consider them the "young man's enemy," for it is appalling to think of the host of young men who have thrown away their best energies and hopes in the preparation of useless drawings. These waste drawings, accumulated for a period of twenty-five years, Mr. Porter computed would pave a way from this room to Grantham, or their strainers, lying one on top of another, make a

tower 1,000 ft. higher than the highest mountain in the world. This computation is far below the actual facts, however; but it, also, refers only to public competitions advertised in the *Builder*. The great names in art are not altogether those of men who have risen to acknowledge supremacy in early life, and early success is usually vastly detrimental to the artist. The very essence of true power is that it shall come of long vigils of self denial and long years of self-contained labour. A genius usually has to make his own public. In these days the matter for remark is not slow acknowledgment of worth, but rather the numbers of men who spring into superficial notoriety, and who are never again heard of, or whose names are never associated with any admirable or commendable work. This is because men spring into notability upon specious and meretricious qualities. Merit is content to wait; demerit is not. The men who are most successful in the professional life, in their art, are those who start without fallacious incentives, false altars and without haste, and without greed of the rewards of acclamation and patronage, which is the gift of the discerning British public. I may here quote from the debate on Mr. Porter's paper some words spoken by Professor Kerr, which are both interesting and remarkable, as being the balanced opinion of one who had had a wide and varied experience:—

"The only conclusion I can arrive at with regard for common sense is that the system of architectural competition is radically unsound in principle, and in practice most prejudicial to the profession of architects both financially and morally. Whether it benefits the public in any way may for a moment be questioned, but even on this point the answer must be eventually in the negative. . . . Commencing at the age of twenty in no less remote a place than New York where I gained my first premium, I find that I have engaged in about twelve competitions, never competing at random, and frequently trying what I could do, as if for the honour of the cause, in the most important contests. I have gained four prizes, one second, and two otherwise highly satisfactory positions; once I was paid in full with the others, and four times I have been wholly unsuccessful. I mention this with a certain hesitation for the sake of saying emphatically that, in spite of all, I have never got any real good by competition. . . ."

I have never known any man succeed in establishing by competition any reputation which he would not have better acquired without it, except occasionally a bad reputation, which, but for competition, he might fortunately have been able to escape. I know of no other temptation in business so subtle as that which assails, as I think, a high-minded man when involved in architectural competition, especially if he is to be successful. I know of men who have succeeded by competing in attaining to the promise of a position which they were not qualified to hold, but they have never been able to retain it, and have in several cases been ruined in the legitimate prospects by the consequences of their hasty and uncalculated good fortune. I do not hesitate to say that competition success leads generally to personal and public disrespect; and this through jealousy alone or personal offence, but reason of the ordinary estimate of the qualities which alone such success can be obtained."

It is a common usage to exclaim against the promoters of the competition when there has been inequitable treatment of the competitors, or a precedent has been made in new irregularities. This, however, is unreasonable. Competitions are not a matter of philanthropic consideration—there is no suggestion of philanthropic motives or of mutual concessions, mutual benefit. In any other transactions, involving such large outlay, and such weighty consequences, the architect, in common with his fellow-citizens, protects himself according to commercial usage, and there is no reason why he should make an exception in the case of competitions. A Town Council decides something for which it is prepared to disburse certain moneys or advantages, and architects by accepting those terms, have committed themselves beyond dispute as being satisfied with them. The promoters, regarding the matter solely as a commercial or business enterprise, can only suppose from the rivalry and enthusiasm the competitions evoke that they are esteemed and valued of the public. It is no conspiracy on the part of the promoters, that has led to this lamentable state of affairs, but a conspiracy of greed and weakness on the part of the profession. I take the liberty to again quote from Professor Kerr:—

"I am sorry to say," he remarks, "as a result

ing and intimate acquaintance with the professional architecture in all its departments, that there is among the young men—even among the best men—an undisciplined restlessness and a feeling of rivalry with their seniors; in one word, an absurd impatience of mere self-conceit which exists nowhere else within my observation. I attribute this circumstance—speaking advisedly—to the public recognition of the idea, with respect to architecture as distinguished from everything else, that meritorious adolescence may attain ascendancy by the happy institution of competition.

The framing and enactment of competitions has been said, purely a matter of business of commercial enterprise. Upon no other basis is their existence intelligible. There is question of philanthropic motives, nor of a scheme for mutual benefit. The contests of competition as now drawn up may in general very fairly described as a sham instrument; it is a sham form of contract between the obligations of the competitors are clearly and exactly defined, and the obligations of the promoters set in such loose, ambiguous terms as render them open to any interpretation that subsequent events may show to be profitable to the promoters. The contest of a public or limited competition is purely a matter of contract, and it is the business of each party to see that his interests are properly protected in its terms. It is, therefore, weak and foolish for competitors to cry and protest when they find that they have been worsted of the bargain. It is usual in such cases to charge the promoters with having taken their word, with having falsified their licit undertakings, but surely redress for an injury as is here claimed lies not in the pathetic columns of the Professional Press, in an action at the High Court. The truth however, that it is very rarely that promoters of competitions go back on their precise undertakings or falsify their explicit promises, is not for any qualms of sentiment or conscientious scruples, but for sheer lack of precise undertakings to go back upon, and for dearth of any explicit promises to falsify. When an assessor's award is set aside, or when the winner of the first premium is supported in his commission to do the work, are invariably long and loud protests; hectic appeals to common honesty and fair play, from us poor architects, who forget greedy rivalries for the moment, and are in one common sympathy of misfortune. Someone read a paper once on "Professional etiquette." One does not think it could have been unduly long. This common misfortune may be described as the only bond of sympathy existing among us. But to keep to the subject of conditions of competition, I have drawn up a table which enables me to subdivide what I say. This table gives the gist of thirty-two conditions and instructions, as set to competing architects, taken haphazard in the portfolio lately instituted for this purpose, in the library of the Royal Institute of British Architects. Upon this basis I find that 50 per cent. of cases an assessor is appointed, that in 77 per cent. the premium merges in commission; that in no case is the winner of the first premium promised the work, but that, on the contrary, 54 per cent. state that the committee is "not bound to accept first award," and 35 per cent. state that they do not bind themselves "to accept the first or any design." That in no case is the assessor's award stated to be absolute, but that, on the contrary, in 10 per cent. (estimated on a basis of thirty-two instances) of the cases it is expressly stated clearly implied that his award will not be absolute—that the committee do not hold themselves bound by his decision. I may also call to attention to other little delicacies offered, here the thoughtfulness of promoters is again manifested. In order to mitigate the fevered enthusiasm and passion of emulation with which they have noticed we fling ourselves into competition, they have doctored the commission in some 10 per cent. of the cases by taking the 5 per cent. include quantities of their extraordinary expenses. I also discovered four cases where no conditions existed at all, and also a little gem, where there was no premium offered, and yet another, where the guinea premium was to merge in commission if the work was carried out within five years.

And now, gentlemen, we come to put the finishing feather in the cap of the guy which the profession has manufactured and parades before the derision of all sensible people. Although these conditions are so monstrously

unreasonable, prejudicial, biased, unbusiness-like, and unfair, nearly all of them have been ratified and approved, if not actually drawn up, by a professional assessor; an established architect of position and, usually, of reputation. It is hardly necessary to remark that this state of things is opposed in spirit and in detail to the "Suggestions for the Conduct of Public Competitions," published in the Institute Kalender. It is hardly fair, however, to hold assessors individually responsible; for it is the common usage, the custom of the profession. Every competitor, we know, would be an assessor if he could; and it is not to be expected that a man should martyr himself in a cause where his individual self-denial would work no good, and for which he would receive no thanks or even recognition, but it is indeed deplorable that such a state of things should exist. How are architects, in the face of this corruption, which they sanction and maintain, and even promote, to support any attitude of dignity and integrity for the profession in the eyes of the public? Is it to be marvelled at that a young architect is expected by his first clients to work for nothing? We most of us have been invited to drains as though we were being asked to dinner. Some time ago it was under heated discussion whether architecture was an Art or a Profession. I believe the matter was not altogether definitely settled, but for one's self, as it has altogether failed as a profession, one is bound to consider it an art. When, however, we travel behind the scenes of our competition system, the matter would seem to resolve itself into the question: Is architecture an aberration or a vice. I submit, that of the general ruck of competitions not one grain of professional or artistic enthusiasm has place—if enthusiasm may be estimated in grains. The desire to compete is born of unrest, worldly ambition, weak unbalanced inclinations and false hope bred of an incontinent longing for the plums of life before the just harvest time: to be got, not legitimately, but by a short cut. Every one knows that the knack of winning competitions is not the knack of design. Even Sir Gilbert Scott admitted that his designs made in competition were necessarily different from those he would have made for a private client. Professor Kerr has insisted that the man who wins is the man who gets the best information from the best source. The ordinary competitor does not think of consequences, or he would not compete. He is buoyed by excitement; and it is this memory of his intoxicating excitement which prompts him and entices him to further risks. It is no use or purpose to show him that it is forty chances to one against his winning—any more than it is to tell these things to the gambler or the betting man. The whole circumstances of the ordinary architect in competition is that of a gambler making a big stake. The central idea originated in the principal, reverberates through his surroundings. A common way for a competing architect, by a promise of double or treble pay to those who assist, in the event of his success. They all contribute to the understanding that they share the prize money. These sort of transactions are common enough on the turf. Architecture, however, is a profession. One once went to visit some friends who were in for a competition. One called as usual at midnight. Their rooms were full of men, mostly in their shirt sleeves, cleaning and finishing up the drawings. In a corner, a young quantity surveyor was getting out an estimate like a man possessed. There was also a frame maker, blocking two doors and a passageway. Excepting the frame maker, possibly, the whole crew were banded together for the excitement, the sport, the glorious uncertainty, and the chance of treble pay and long drinks if the principals came in winners. Architecture, however, is an art.

The whole atmosphere and environment of competitions is corrupt. I know personally of a competitor who was approached frankly—unreservedly—indecently—by a member of a Promoting Committee in a late competition. The committee-man inquired whether he wished him to work for him on committee. The whole unruly surroundings of competitions is opposed not only to professional dignity, but to the ordinary natural sensitiveness and reserve of a gentleman. This is how one would have an architect to regard the matter, he should apostrophise thus: "My worthy grocerman, I will design and build you your bacon larder, or your genteel residence, with

its gewgaws and furbelows, and thank you for the commission; but I will not struggle at your door with forty others, to submit my knowledge to the verdict of your ignorance, and put my cultivated taste to the test in the balances of your cultivated vulgarity."

Can anyone believe, until he has eradicated from his mind the whole field of competitions, that architecture is either a profession or an art. Let me tell you the true and fascinating story of Durham, it is not a very old story, but it will bear a lot of re-telling when we wish to be stung to a recognition of the melancholy status of the profession. I especially tell the tale in reference to the question, Is architecture a profession or an art? It will be observed that it is a case which rises out above the general run of competitions to which my remarks heretofore have had reference. In other words, it is an exceptional case, above the average in value and importance.

To begin with, any architect entering for this Durham competition, promoted by the County Council of Durham, had to pay a fee of 5*l.* before he could know upon what precise terms he was to be humbugged. This is a common expedient with promoters to stave off the first mad rush of the architects. The assessor selected six designs, from which he made the final selection of his awards. The committee paid the first premium, awarded a local architect the second premium, and gave the latter the commission to execute his design. This local firm's design was stated not to have been included in the six designs of the preliminary selection. Then the profession made a strong stand. It got right on its hind legs. It objected. It objected in printed circulars sent to the Council. Fourteen of the competitors signed this circular-letter, praying that the winner of the first premium should be appointed to execute the work. They also pointed out that not only was the local firm selected by the Council not included in the first six, but that his design should, under the conditions of competition (for the luxury of which they had staked 5*l.* each) have been disqualified. This memorial was sent individually to each member of the Council, shortly before the meeting which was to make the final irrevocable decision, with the intention, we may presume, of sapping their native resolution with such a show of firmness. Our powers of objection now became almost inspired, and certainly beyond human precedent. Two of the competitors, solemnly appointed and deputed by vote of them all, went and took residence in a hotel close by the building in which the Council were to meet. Think of it! Two live competitors at hand, in a hotel, in person to bring shame to the naughty Councillors! Notification that these two protesting Professionals were actually *in situ* at the hotel was duly sent to the Council. One regrets to say that there is no evidence of the Council having winced in bulk at this ominous news. We can fancy the pallor-stricken subordinate official bursting upon the elect Councillors of Durham with the extraordinary intelligence. One has tried to realise the terrorising effect, or the persuasive influence of a brace of protesting architects in a hotel, inviting there inspection and examination from the townspeople. One has altogether failed. One can hardly picture anything funnier. Our profession is content to go out to battle with a glass tube and a mouthful of rice, instead of having recourse to the solicitor's letter, which is usually employed. The result of this venture was that the Council said that they claimed legal right on the conditions of competition, and, further, that the disqualifying features in their awarded design had not been brought under their notice, while a noble Lord who had got washed up on to the Council in the late high tide of municipal aristocracy, denounced the protesting brothers' cause as "a professional squabble."

What else than something of this kind we could have expected to get from the Council it is not very easy to imagine. The protesting brothers seem to have appealed to the Council's sense of justice, to its goodness of heart, and so forth; which, in face of the printed regulations accepted open-eyed by each competitor, was quite beside the mark, and an affront to both the understanding and the feelings of the Council. Apparently the deputation of protest expected to be answered somewhat as follows: "Gentlemen, we have been touched by your appeal to our good nature and sense of poetic justice, and though we were careful in the

'conditions' to secure a free right to appoint whoever we might choose, yet your eloquence has shown us so clearly how base and shameful our motives were, that we herewith withdraw our decision, and agree to do what you wish." Unfortunately, side by side with our champion objectors' words of appeal, was the complacent admission of the assessor, who told the Council that "of course they were not bound by his award."

And now, gentlemen, bearing this scene in mind, is architecture a profession or an art? A very great number of suggestions have been made for the amelioration or reorganisation and reconstruction of competition, but, so far as I know, no one has suggested that we should, in the matter of competitions, individually regard architecture either as being a profession or an art, or both, and that we should return to that attitude of independence with which it is hoped most of us left school or college, and which was ours before we were enticed to the attitude of the emulative haberdasher soliciting some one's "valued order." We are wont to deal with matters relating to a private commission from a quite different standpoint to that from which we regard competitions; but I think few of us will deny that the wide generality of local competitions has spoiled our clients; and I think you will agree that the ordinary man who has not the advantage of a private fortune or a circle of the right sort of friends is almost compelled to submit to humiliating treatment from his prospective clients.

For my own part, I feel strongly against turning the profession into a sort of trades' union, yet most of the remedies which are suggested imply that, or tend to that end. The matter lies in our own hands. Our disordered competition system is a monument to our incontinent unthinking greed and folly. We have over-reached ourselves, and we must retract and amend, and bring matters back to a condition of ordered decency.

The power lies chiefly with assessors, because they are few, and because they are men of substance and position. It should surely be with them a *sine qua non* for their sanction of conditions of competition, that the terminology is legal and free of ambiguity, and that the various clauses are fair and reasonable. There is a very strong general disinclination to enter a competition where an assessor is not employed. Let it be noticed and understood in the profession that the assessor is a guarantee, that the "Conditions" is a legal document, and that the clauses are fair and reasonable in the circumstances (which at present is far from being the case, as we have seen), and it will soon be difficult to get any one to enter a competition where this guarantee is wanting. This may not do much to ameliorate the radical false basis of the system, but it will mitigate its corruptions and irregularities, and it will enable these affairs to be enacted with such decorum as befits an occupation which is only uncertain whether it is a profession or an art.

Mr. Aston Webb, in proposing a vote of thanks to Mr. Creswell for his paper, said that the question of architectural competitions was a most serious one. The practice was in vogue at the present time, and, as the lecturer said, such was the condition of affairs that "something ought to be done." He had listened very carefully to the paper, and he was very much afraid that the result of it would be much the same as that which followed other efforts in the same direction. He had listened very attentively to Mr. Creswell's conclusions in order to know what, in the lecturer's opinion, should be done; but he did not gather from the paper that Mr. Creswell had any special remedy to propose. He, the speaker, knew Mr. Porter very well, and it should be remembered that that gentleman himself very often took part in competitions, and although, according to his statistics, competitions had such disastrous results, he was a competitor on a good many occasions. It was impossible to check the statistics either of Mr. Porter or Mr. Creswell, and as had been said there were such things as "lies, big lies, and statistics," and, unless one were very careful, statistics might prove to be the biggest of all. It was impossible to tell the actual cost of competitions, and although no doubt it was very heavy, and although the cost was a grievous burden to the profession, still the question was, what could be done to reduce the burden? He thought that Mr. Creswell hardly laid enough stress on what had been done, although he did mention the Memorial which Mr. Street had presented, and to the preparation of which Mr. Cole Adams gave a great deal of time. The object of the memorialists was a very definite one, viz., to induce architects not to compete where an assessor was not appointed. A strong point in Mr. Creswell's paper was that highly trained and cultured men were willing to submit their works to what had been called the "crass ignorance of the grocer-man"; no doubt that had been so, more especially before the presentation of the Memorial; since then a great improvement had taken place, and a qualified assessor was now a generally-recognised factor in a competition. Where there was an assessor, architects should decline to compete, and they should also decline if they had no confidence in an assessor, and if they were not satisfied with the conditions. No architect could be too careful in satisfying himself as to the fairness of the conditions, and as to whether the assessor was a man of knowledge and of sufficient backbone to secure the carrying out of his opinions by committees. According to his experience, committees were more lacking in knowledge than in fairness: they really did not understand architectural matters, and if the subject were laid clearly before them by an assessor they were generally ready to accept his opinion. He, the speaker, was not concerned to defend the system of competitions; he knew the great harm that had been done by them. At the same time he could not say that the system was altogether bad, and one advantage was that an opportunity was presented to young men to make a name earlier than they might otherwise do. The question might be considered under three heads: The effect of competitions upon architecture, architects, and upon the public generally. With regard to the effect upon architecture, a system which had produced the Houses of Parliament and St. George's Hall, Liverpool, could not be said to have done badly by architecture, and there were many modern buildings, which would be invidious to mention, which had been the result of competitions, and which had distinctly advanced the art of architecture in England. Undoubtedly the planning and arrangements of public buildings had been

ANALYSIS OF THIRTY-TWO CONDITIONS OF PUBLIC COMPETITION, AS ISSUED TO COMPETITORS, TAKEN AS THEY CAME TO HAND FROM THE PORTFOLIO AT THE LIBRARY OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Value.	Premiums.	Assessor?	Premium to Merge in Commission.	First Award to Executive.	Drawings Property of Committee.	Assessor Absolute.
—	50/20/10	Yes	Yes	Not bound	1	No
—	20/10	Yes	Yes	" "	1 and 2	No
500	10/5	?	Yes	" "	1	No (5 per cent. including quantities)
(over 9,000)	50/25	No	Yes	" " Nor any	1 and 2	No do. do.
4,000	30/20/10	Yes	Yes	" "	1, 2, and 3	No
3,500	25/10	No	Yes	" "	1 and 2	No
1,800	20/15/10	Yes	No	" "	1	No
30,000	100/50/25/15	No	Yes	" "	1, 2, 3, and 4	No
5,000	30 and 20	No	Yes	" " Nor any	—	No
15,000	50/30/20	Yes	Yes	" " " "	1, 2, and 3	No
5,000	30/15	Yes	Yes	Yes: if competent	1	No
—	20	No	No	Not bound. Nor any	—	No
2,500	20/10	No?	—	Designs only asked	1 and 2	No
10,000	75/50/25	Yes	Yes	Not bound	1, 2, and 3	No
—	None.	No?	—	" "	Yes	No (5 per cent. to include travelling, attendance at board, extras on contract, &c.)
300	7/10/2/10	No	?	No mention of execution	1 and 2	No
—	—	—	—	No conditions	?	No
—	20/10	No	Yes	Not bound. Nor any	1 and 2	No
5,500	50/35	Yes	Yes	" " " "	1 and 2	No (5 per cent. No expenses)
?	150/100/50	Yes	Yes	" " " "	1, 2, 3	No
4,000	25	No?	Yes	" " " "	?	No
?	10/10	Yes	Yes	" " Nor any	?	No
7,000	40/20	No?	Yes	" " " "	1 and 2	No
4,000 (about)	—	—	—	No conditions	—	No
1,800	—	—	—	—	—	No
4,500	50/20	No	Yes	Not bound. Nor any	1 and 2	No
0,000	40/20	Yes	Yes	" "	1 and 2	No
15,000	50/25	Yes	Yes	" "	1 and 2	No
4,000	—	—	—	No conditions	—	No
7,500	—	—	—	" "	—	No
7,000	40/20	No	No	Not bound	1 and 2	No
8,000	—	—	—	No conditions	—	No

THE AVERAGE ENGLISH PUBLIC COMPETITION.

Computed from the basis of seventy-one English Public Competitions advertised in the *Builder* in the years 1894-5*; from particulars of these same competitions subsequently appearing in the body of the journal; and from an analysis of thirty-two "conditions of competition" (see other table).

Value.	Premiums.	Competitors.	Promise of Assessor.	Premiums to merge in commission.	Promoters "not bound" to accept "1st award."	Promoters "not bound" to accept "1st or any award."	All Premiated Designs Property of Promoters.	The 5 per cent. commission to include extraordinary expenses.	Assessor awards admitted to be a privilege.
£9,000	1st £50, other prizes to value of £52.	40	Over 50 per cent.	77 per cent.	54 per cent.	35 per cent.	73 per cent.	16 per cent.	Practically never.

* It is not meant that each item has been worked out from seventy-one cases. Full particulars of every case were not to be obtained, but the number of cases yielding each figure was sufficient to guarantee accuracy for round numbers.

ally advanced, and by the publication of competitive designs what might be called a tradition was growing up as to certain classes of buildings. He quite agreed that harm was done to young architects by the gambling spirit; it opened visions before them which would take them away from their general work, and was deleterious to them; but, on the other hand, a young man, when he commenced practice, had generally a good deal of spare time, and his hours were not presented by golden guineas. In many competitions, the work in the preparation of designs is being largely reduced, and now the labour of the cost of such preparation need not be very great. For a capable assessor to arrive at the merits of a design, a very slight sketch plan all that was required, with a certain amount of detail in elevation. He never heard a case where the clerks were offered twice three times their salaries for the preparation of designs in the event of the competition being won, and he was sorry that Mr. Creswell should be able to say so. With regard to the public generally, take the case of a competitor for a public building—for most competitions were for public buildings, and it would be a misfortune to become the custom for the private house to put out to competition—where the committee had architect friends. What better way could be devised for the selection of a design than by inviting four or five gentlemen to come, or by having a public competition? He did not think that a small committee would do better if they employed one of their friends in if they had a competition. At present all architects charged the same for their work—youngest and the most experienced, and was a matter of surprise to him that under such circumstances young men got work to do all. It was a pity, perhaps, that experienced architects did not increase their fees. As it was, young men had extreme difficulty when they first commenced to practice in getting work to do, especially if they were ambitious of public and important work. There was a certain amount of pleasure which a young man must feel in preparing designs for a large scheme, in which he could give scope to his imagination; and that should not be ignored. He thought the remedy for some of the evils of competitions was to be more careful as to the conditions; and if they were not satisfactory, object before, rather than after, and if their objections were not satisfactorily dealt with, to abstain from competing altogether. If this were done, it would greatly strengthen the hands of the Institute, and lead to the improvement of the conditions. The more particular architects were, the fewer competitions there would be, and those competitions on a large scale would be more fairly conducted than at present time. There were strong indications that the system of competition was not so healthy in public favour as it used to be; indeed, there were signs that it was dying out. If architects wished for that result, there never was a better time than the present for bringing it about, and never a better time for concerted action to insist upon conditions being fairly and properly laid down.

Mr. E. W. Mountford, in seconding the vote of thanks, said he thought Mr. Creswell had overestimated the cost of competitions to the younger men, as well as the harm that they were likely to incur from them, because, as Mr. Webb had said, a young man's time was seldom so fully occupied as he might wish. If an architect could get enough work without competitions, he would do well to leave them alone; but even then most young architects did not seem to be content with small works. A man of ambition considered it a privilege to prepare a design for a large building even when he knew that he had practically no chance of ever getting it out. Moreover, he must benefit largely from such preparation, supposing he took the necessary care in working out his designs, and visited other buildings of the same kind. That would teach him a great deal which he would not otherwise learn. If architects could compete for buildings where the instructions were obviously absurd and unfair, then they must take the consequences; and, unfortunately, men were to be found ready to compete for any kind of building, and under any conditions which might be issued. He and his architect friends were recently invited to compete for a building which was to cost £100,000, and he thought that if a man would compete for that he would do so for anything. A good deal lay with assessors. An

assessor should be a man who had had considerable experience of the kind of building for which the competition was being held, and he did not think it right for a man whose practice had been confined entirely to private houses, for instance, to undertake to be a referee in a competition for a technical institute, or for any buildings of whose special requirements he was ignorant. Assessors were generally thoroughly up to their work, and acted to the best of their ability; but he thought that if they were selected with more care, and if the competitors were to insist upon knowing the selection before competing, there might be fewer unsatisfactory results than at present. One improvement in competitions had undoubtedly taken place; one did not now hear, as he did in his younger days, of dishonest decisions by referees. They had almost got beyond that, though one did occasionally hear of a referee carrying out the building himself. Generally speaking, there was very little cause for finding fault with the decisions, and it was evident that an improvement in architecture had been the result of the system. Probably, the two most important classes of buildings for which one never heard of competitions were theatres and public houses, which, though mostly costly buildings, were generally very unsatisfactory from an architectural point of view. In regard to committees, if it were left to an ordinary committee to select an architect to carry out a small public building, the result would generally be less satisfactory than if a competition had been held. He was of opinion that competitions were not entirely evils, although they undoubtedly had a bad side; but, on the whole, they had resulted in better buildings and better work generally, while young architects had opportunities of doing good and important work which would be denied them if competitions were entirely given up.

Mr. F. T. W. Goldsmith said that it had always seemed to him that the "grocer man" was more to be pitied than blamed, or he was called upon to embark upon a competition scheme for the successful carrying out of which he had not the necessary knowledge. The conditions of a competition, too, were very often issued by an almost equally inexperienced town clerk, who was sometimes also scornfully ignorant of architecture. It had always seemed to him that the Institute or the Association might very usefully be brought into touch with the promoters of competitions at the inception of the schemes—before they were advertised in the public press—because he thought if that could be done some official assistance might be usefully offered, and the good results which would follow would be very widespread. It had been suggested to the Competitions Committee of the Institute that some system should be inaugurated by which representatives of allied societies should be empowered to take notice of any competition that was being discussed or suggested by local bodies and communicate any information direct to the Institute. Already that suggestion had been acted upon, and it was hoped that better conditions would be issued. If some system of the kind could be generally adopted, it would, with the co-operation of an assessor, result in decided improvement. Already the Institute Committee were communicating with the promoters of any competition which was advertised in the professional journals, but they were frequently too late, for, in most cases, when the conditions were once issued, no amount of suggestion would alter them, except, perhaps, at the strongly expressed desire of the assessor. Quite recently it was announced in an advertisement of a competition that an assessor "may be appointed." Representations were made to the advertising body, and subsequently the objectionable word "may" was omitted, and it was now decided to engage an assessor. If promoters of competitions could be induced to publish the assessor's name at the time of advertising, it would give more interest to the competition. Unfortunately, cases were known of assessors, members of the Institute, acting in the capacity of referees where the conditions were not in accordance with the "Suggestions" of the Institute, and he felt sure that such a course must result in harm. Pressure ought to be brought to bear on an assessor to induce him to insist that all the conditions of a competition should be sent to him in the first instance, and his willingness to act should be conditional upon his approval of

these conditions. If this were done, there was some reason to hope that competitions would be decided more or less according to the assessor's award, and where this was so he did not see how public buildings in this country could suffer architecturally or otherwise, and if members of the Association and the Institute were to co-operate in this direction he thought that the criticisms of the lecturer could not be made with the same effect ten years hence.

Mr. Beresford Pite, in supporting the vote of thanks, said he thought that the lecturer stood no more chance of succeeding in impeaching the profession than Edmund Burke's friend would have done in impeaching a nation. Matrimony had been defined as an insane design to provide bread and butter for another man's daughter; and it was the same sort of insanity that led architects to provide designs and plans for any one who chose to ask for them. Connected with the Baptistry Gates at Florence, the competition for which was won by Ghiberti, Brunelleschi, who had also competed, went afterwards to Rome and there studied the Pantheon and evolved the dome of the Duomo, which was also, he thought, the result of another competition. Competitions were often useful and delightful, and they served a number of purposes to an earnest designer, though they did not to the public. There was the delight of merely designing a big building, for architects were people who built castles in the air; and to imagine one's self erecting a building which was to cost several hundred thousand pounds was a delight in itself—such as the Phebe Hearst Buildings, in California. Competitions cultivated the faculty for design, which architectural students did not sufficiently practise; a certain amount of knowledge and facts were acquired, and, in designing, the tap of Gothic or Queen Anne was turned on, whether for a library or for a stable. The best advice to offer a student was to take a particular class of building and work at it—church, or hospital, or institute—and to master the art of design by perpetual study. The knack of winning competitions, which some members of the Association possessed, was solely acquired by study and persistent practice. The competition system had, beyond any doubt, been improved. It must not be forgotten that Mr. Aston Webb was the co-secretary with Mr. Cole Adams of the Memorial Committee, and the improvement to which he referred was largely due to them. The lecturer had stated that in half the published conditions of competitions the assessor was named, and this was a very decided improvement upon the days before the Memorial. Another improvement in competitions was noticeable in that before the days of the Memorial, greater difficulties were experienced with parsons over ecclesiastical buildings than with the "grocer man" over "corporation" buildings. They were effecting improvements by degrees, but it should be recognised that competitions should be made more public. The exhibition of the designs should be insisted upon persistently; the absurdity of the fact that the first premium offered was merged in the commission ought to be advertised a little more generally; and the sum of money which was facetiously offered as a first premium ought to be added to the other premiums or divided among, say, six competitors, instead of putting a second and third in order, which was absolutely useless. In regard to the system of assessors himself, he had a radical suggestion to make. If the assessor worked without a fee, one would be appointed in every competition, and as the gentlemen who were generally accepted as assessors were, he imagined, above the need of pelf, they might very well be induced to accept the position, as the honour indeed that it was, for the benefit of the profession, without payment. He would like to suggest that the Institute should be prepared to offer the services of assessors to competition committees gratis, on condition that the Institute had the opportunity of issuing the conditions. Why should not the Institute Competition Committee undertake the adjudication of the competitions? Failing that, let them do away with the assessor altogether, and as competitors, subject to the conditions being such as they approved, insist upon having the award of the competition in their own hands. He thought that men who had worked out the problem of a competition would be those best qualified to decide upon the merits of a design. There was enough honesty among members of the profession to recognise and acknowledge the good points in designs other than their own. One other advan-



GROUND PLAN

Malvern College Chapel.

tage for the competition system was that it separated the able men from the duffers. Competitions also had an inspiring effect upon the inner life of an office. They were, as it were, nurtured on students' competition by the Institute, and he supposed they would continue to compete, notwithstanding what had been said against the practice.

Mr. C. H. Brodie said that he would suggest to Mr. Pite that the good which could be derived by young men in preparing competition drawings could be equally well obtained in preparing drawings which were not for competition. The same good to an architect would follow if the drawings were made conscientiously; and he contended that in sending them in, an architect was helping to degrade the profession. He did not think that Mr. Webb had grasped the conclusion of the paper, which was an appeal to young architects not to go in for competitions; though, as they must all know, such a request was perfectly futile. One of the strongest instincts of man was that of gambling, and as competitions were nothing more nor less than gambling, the system would continue. If this were not so, drawings would be made for the sake of study and enlightenment only.

Mr. G. H. Fellowes-Pryne said they had heard that evening two extreme views in regard to competitions, and he did not think that they could have had better exponents of one side than the two most successful competition winners the Association had amongst its members, viz., Messrs. Webb and Mountford, and at the same time all must appreciate the clear and able manner in which the manifest disadvantages of the present system of competition had been put before them by Mr. Creswell. As to the gambling spirit referred to, he thought that it did not exist so much amongst young men, who were usually striving for an honourable end. The designs for such buildings as provincial town halls, churches, &c., were often not made in the office of the local architect, but in London, by men who were badly off, and the local architect had the credit of carrying them out. He, the speaker, was called upon about two years ago by a man who had not the necessary knowledge, and asked if he would go into a competition, half and-half, for a church. That showed the condition at which professional men sometimes arrived. He hoped that some good result would follow the paper. Competition as competition could not be condemned wholly; it existed in every branch of work in art. Work for the Academy was in a sense competitive, and there was no objection if competitors made true art the object of their efforts, instead of only monetary considerations. Nevertheless, one simple fact had to be faced, that generally speaking, the individual members of the profession were poorly off, and had to work very hard for their living. In regard to premiums, he thought it was only fair that some should be offered, and, if possible, divided amongst a larger number of the competitors.

Competitions might have evils, but if men of experience were chosen as assessors he thought the objections might be endured.

The Chairman, in putting the vote of thanks, said that he was glad to hear Mr. Mountford say that in recent years there had been very little cause to complain of the judgment of assessors, although that was not exactly his own impression.

Mr. Mountford: I said "no cause to complain about honesty."

The Chairman, resuming, said it was important that assessors should be above suspicion, although he did not know whether that was altogether the case. In regard to the question whether the name of the assessor should be published, he thought it was going a little too far to say that unless the name were obtained they would not compete. He thought that in many cases it was a decided disadvantage to know who the assessor was to be. In cases where it was known a large number of competitors strove to make their designs in the style adopted by the assessor; and that was a misfortune, since it was mere imitation. Mr. Pite's suggestion as to a free assessor was a very radical one, and he did not suppose that competitors as a rule would disagree with it, especially as it would result in having assessors in all competitions, for it was a question of expense whether they were appointed or not. He was afraid that leading architects who had so much to do would not be able to give their valuable time for nothing, while the subject of competitors being their own assessors had been mentioned before, and a good many competitors considered the idea was a good one. He thought so too, although it would be impracticable in some cases. It would apply to a town or place where a competition was limited to the competitors there; but suppose the competition were in the provinces, and a number of competitors from a distance sent in designs, would they care to go to the expense and trouble of travelling to the town for the purpose of voting upon the designs? And unless a large number of the competitors recorded their votes, a little ring might be got up and the affair settled in an unsatisfactory way. He was interested in what Mr. Fellowes-Pryne had said in regard to competition-mongering, and he might say that they would all be glad if that sort of thing were put down. The practice was not confined to public competitions, and it was a great misfortune that such things should be. Mr. Creswell had referred to the question of economy of competitions, and he, the Chairman, did not agree with what he said as to cost, and he thought that the lecturer's calculations were exaggerated. Architects were principally to blame for great cost, but although, as Mr. Webb had said, a great deal of labour in the preparation of plans was unnecessary, the fact remained that architects did go to a good deal of expense and trouble in preparing competition drawings. Where assessors were engaged it was a great mistake to throw time and money away upon

elaborate drawings, when what was necessary could be done much more simply in another way. He would like to see the work cut down, and that could be done if the conditions of the competition were properly looked after. He was glad to hear that the Institute Competitions Committee was an active one, though he must say he did not think it was quite as active as it might be, and that where competitions were unsatisfactorily settled some authority should be prepared to take up the case of aggrieved competitors. They could get the assessor question settled in a satisfactory way great improvement would be brought about. He thought that something material had been done in the last twelve years to improve the character of competitions since assessors were very frequently engaged now. The system was not perfect, but it was much more so than it was before the Memorial was presented by Mr. Street.

The vote of thanks having been put to the meeting and carried unanimously.

Mr. Creswell, in the course of a brief reply, said that great improvement had taken place in regard to the appointment of assessors. In 1872, when the Institute Committee drew up their conclusions, they found that assessors were rarely appointed, whereas now, in more than half the competitions, there was an assessor, which made it the more deplorable that there was not more substantial benefit from the work they did.

The Chairman announced that the next meeting would be held on May 6, when a paper would be read by Mr. W. Eckstein, "Interior Lighting" (reflected lights), and another by Mr. Tom Ekin, on "Electric Light as Applied to Architecture."

The meeting then terminated.

Illustrations.

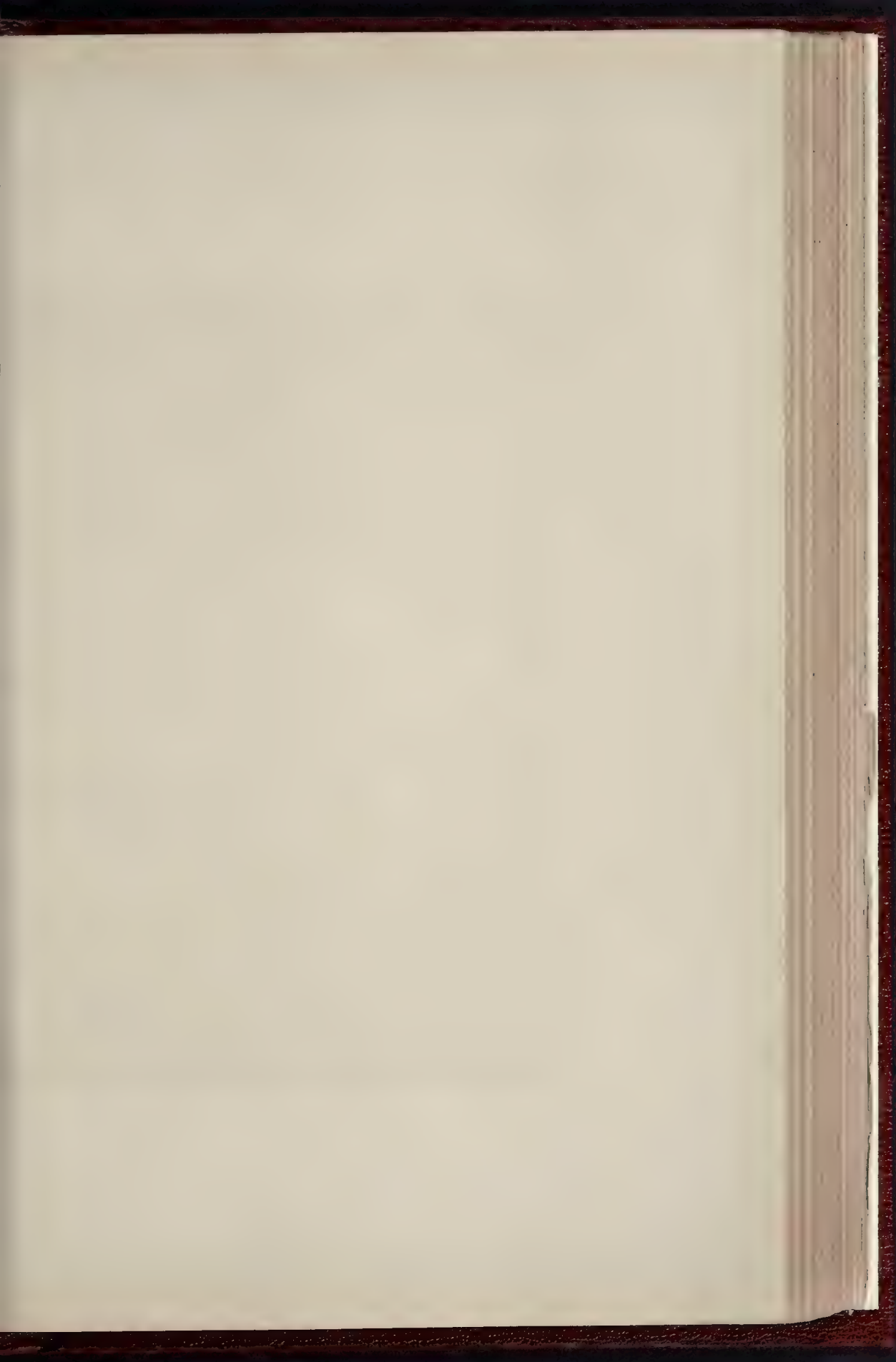
ST. GEORGE AND THE RESCUED MAIDEN.

THIS large group, in bronze, occupies the central position, facing the entrance door, in the octagon hall at the Royal Academy. Mr. H. C. Fehr is the sculptor.

It is a finely composed group; the treatment of the armour, so suitable for bronze sculpture, is very effective, and the attitude and countenance of the knight dignified. The jarring note, to our thinking, is in the rather common place exhilaration of the woman, who can hardly be accepted as the traditional "princess," whose expression and manner suggest a gam of romps rather than the thankfulness of deliverance from death. But in a decorative sense the work is quite a success.

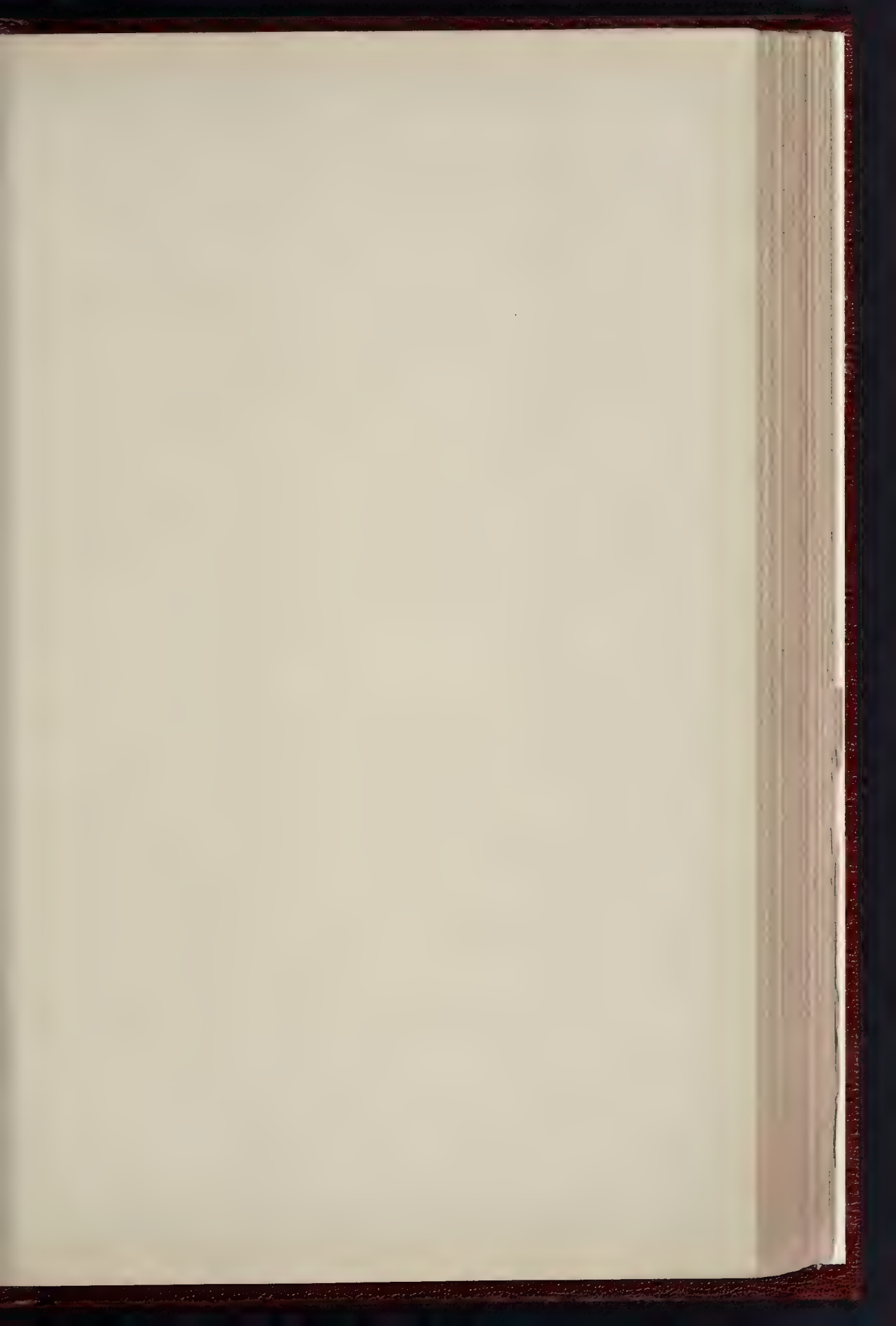
NEW CHAPEL, MALVERN COLLEGE

THE College at Malvern, built some thirty years ago, has, up to the present time, had a detached chapel, part of the upper floor of the south wing having been used for that purpose.

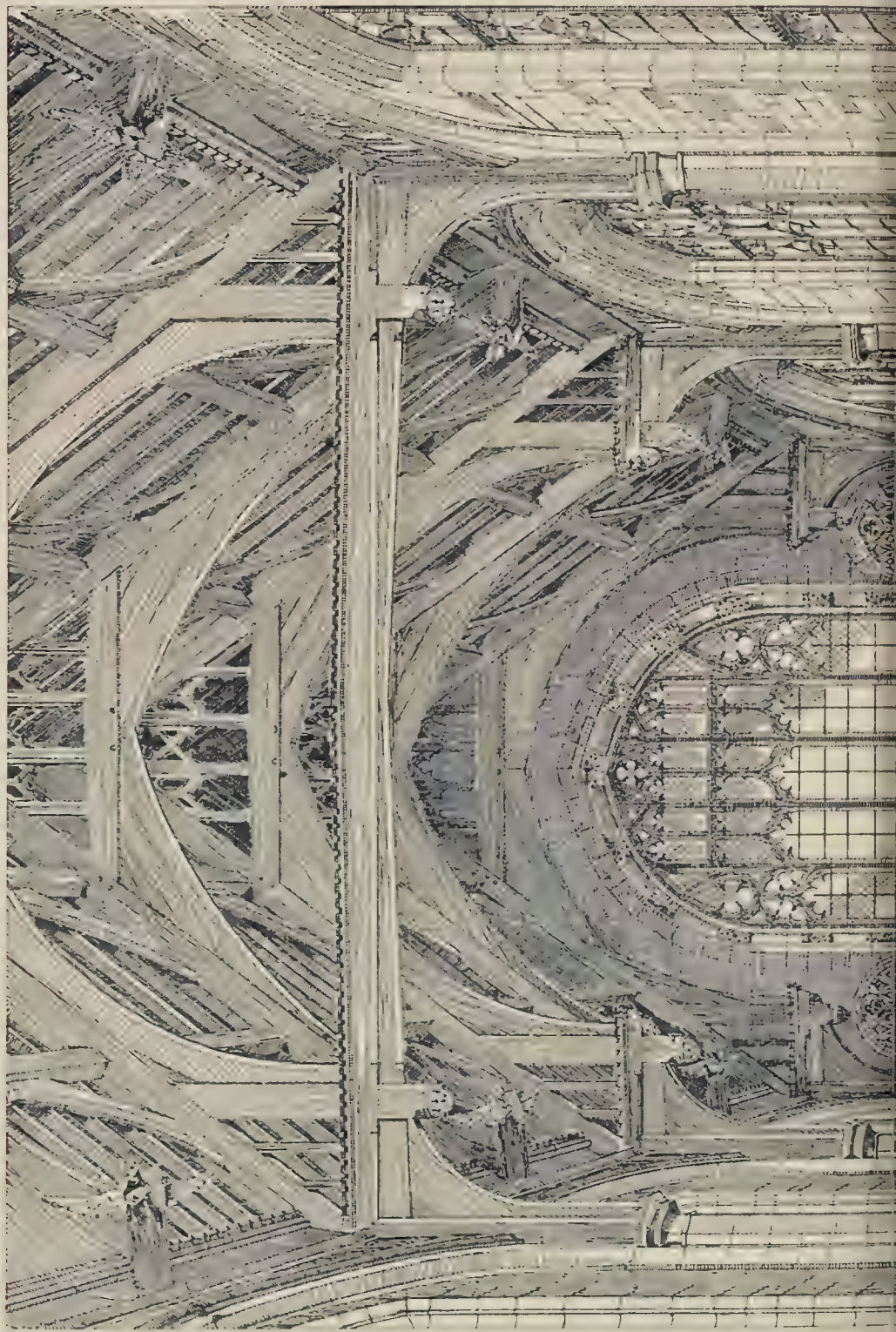


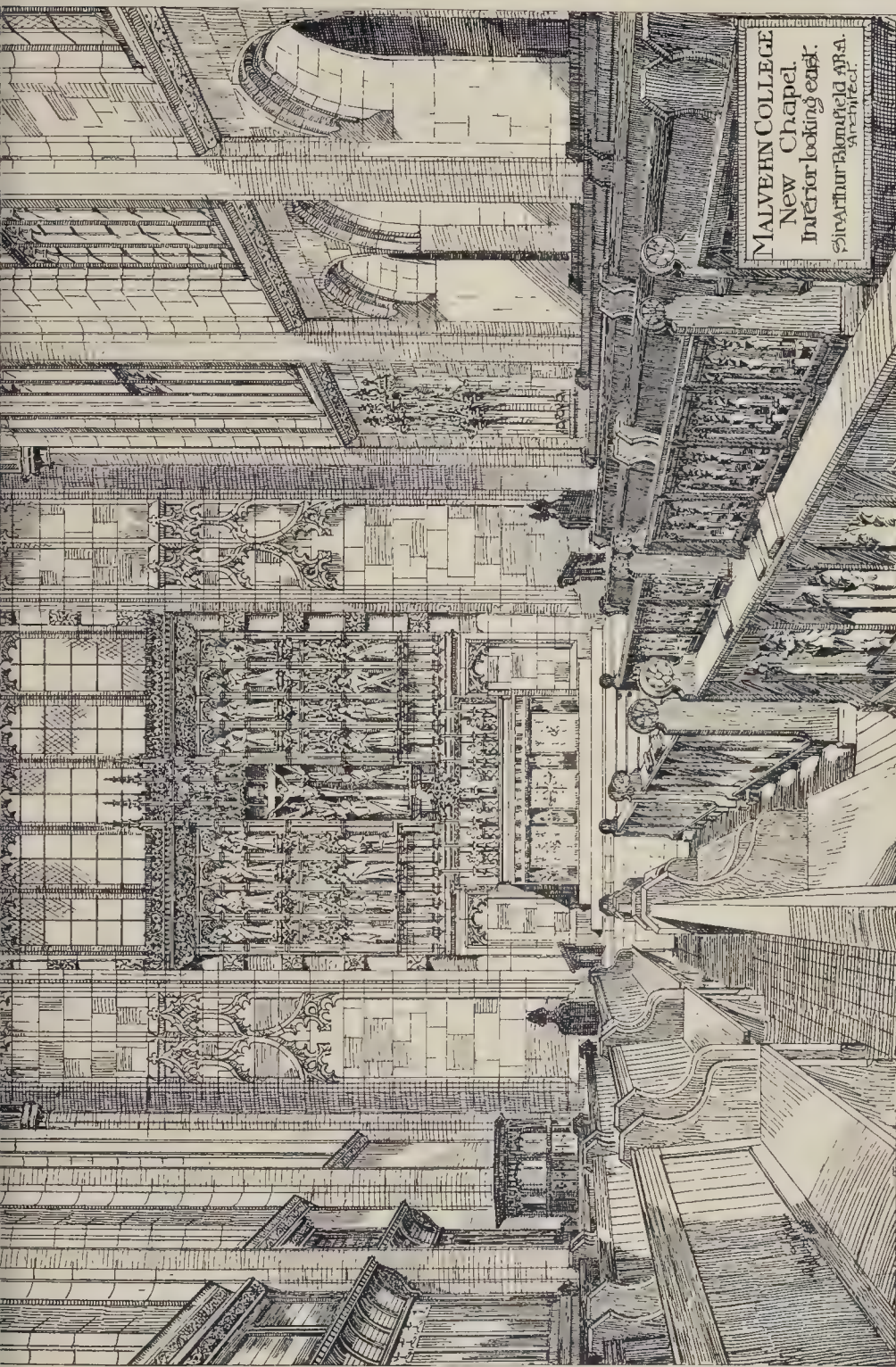
THE BUILDER, APRIL 30, 1898.





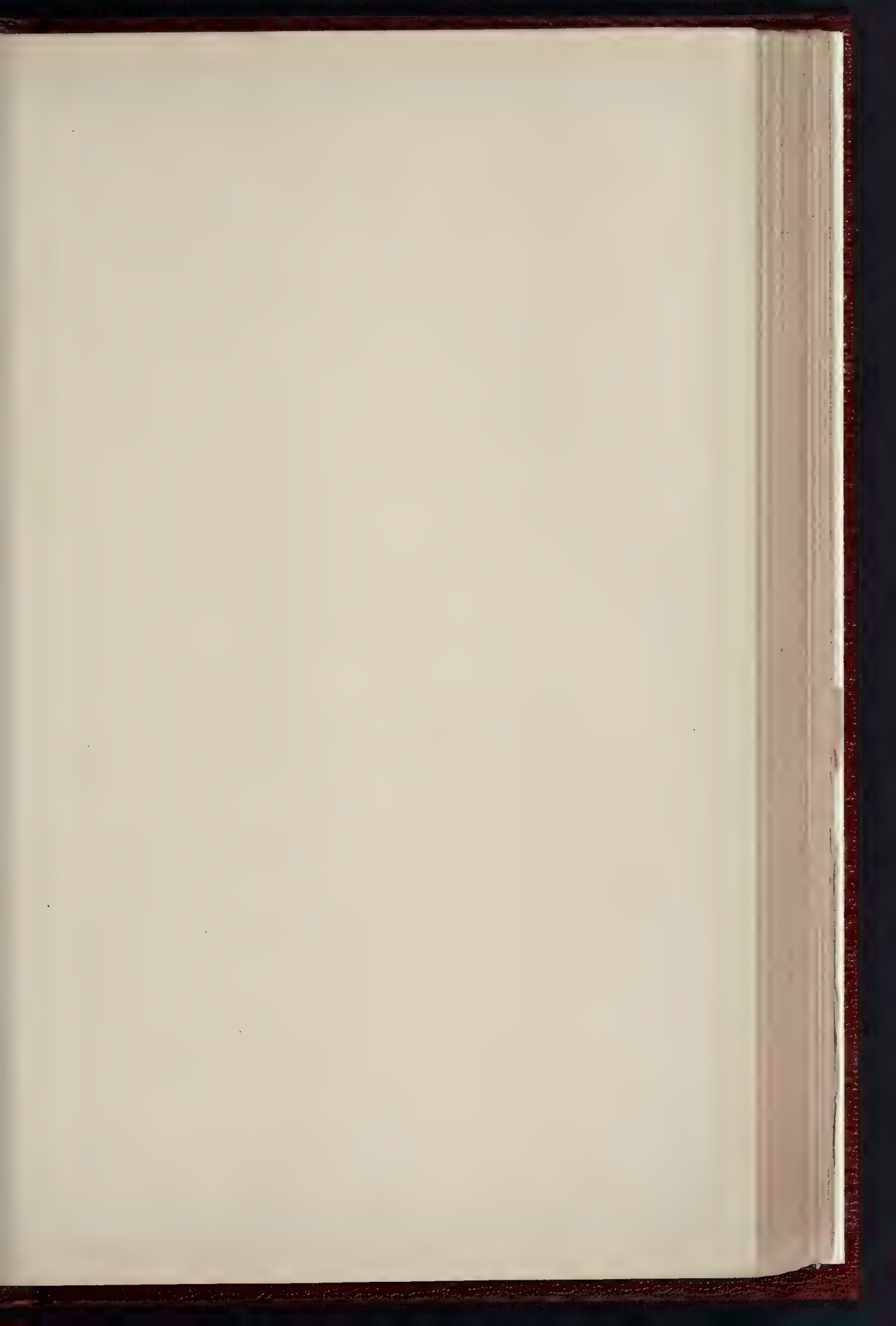
THE BUILDER APRIL 30 1898





MALVERN COLLEGE
New Chapel.
Interior looking east.
Sir Arthur Blomfield, Bart.
Architect.

PHOTO. LITHO. SPRAGUE & CO. 485, F&O. HEBBING, STREET, LONDON, W. 1.



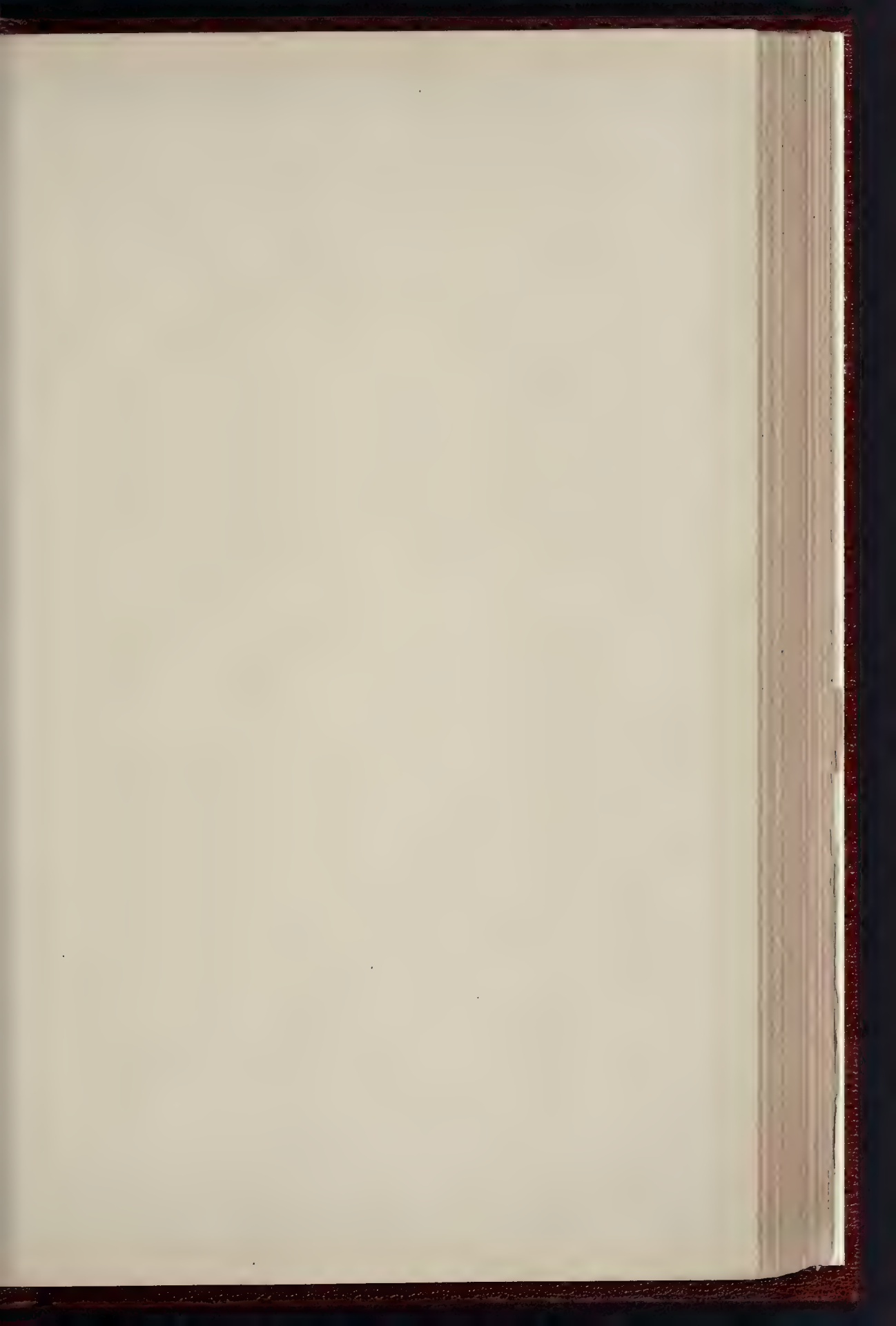


SCHOOLROOM BY G.E. STREET. RA —→

NEW BUILDINGS FOR
UPPINGHAM SCHOOL

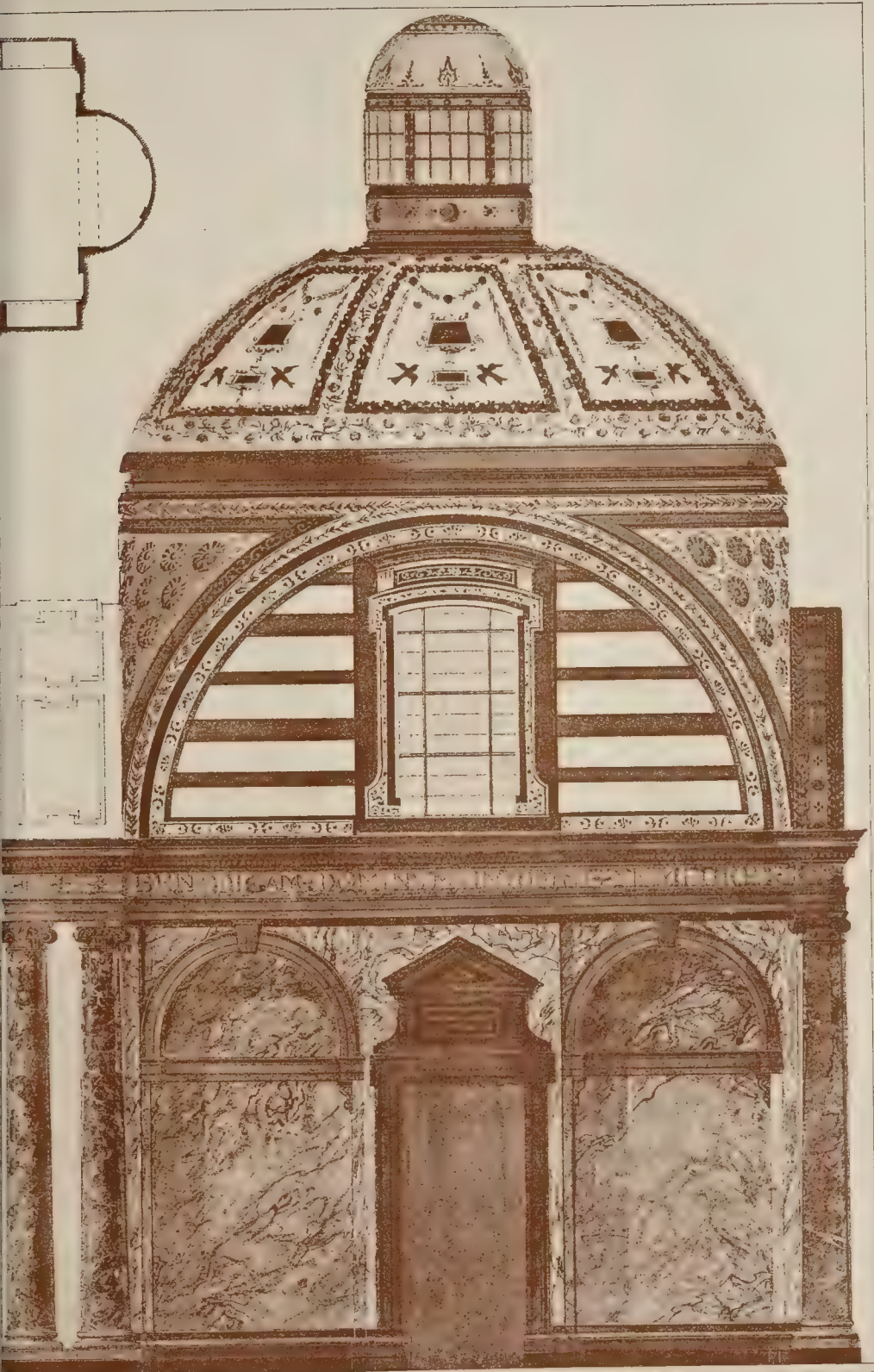


PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET PETTER LANE E.C.





• DECORATION OF A CHAPEL IN MARBLE, MOS



NA PHOTO. SPENCE & CO. 4 & 5 EAST HAREWOOD STREET, FETTER LANE, E.C.

The new chapel is built parallel to this wing and about 50 ft. south of it.

It is planned to seat 444 boys, besides masters and visitors.

The walling is of Molton stone with Bath one dressings, with which material it is also made.

The contractors are Messrs. Collins & Godfrey, of Tewkesbury, and the architects, Sir Arthur Blomfield & Sons.

The drawing is exhibited at the Royal Academy.

UPPINGHAM SCHOOL, RUTLAND.

THE new buildings at Uppingham School will complete a quadrangle which was begun by Mr. Jackson in 1889 with the erection of a new school house for the headmaster and thirty-four boarders, and some additional classrooms.

This building formed two sides of the quadrangle, of which the third was enclosed by Mr. E. Street's classroom. The new block which is shown in our illustration fronts the town street, and forms the fourth side of the quadrangle. It contains a gateway, tower, and porter's lodge, with a museum and science schools to the left, and classrooms to the right of it. At the extreme left is a lecture theatre.

The new science schools and museum and the new tower were inaugurated on December 3, 1897, by H.R.H. the Duchess of Albany, who at the same time unveiled a bust of the Queen, by Mr. Lucchesi, which is placed in a niche in the museum.

The general contractor was Mr. Halliday, of Stamford, the heating and ventilation are by Messrs. Haden & Sons, the fireproof floors by Messrs. Homan & Rodgers, and the laboratory fittings by the North of England School Furnishing Company; the gas work is by Messrs. Strode & Co. Mr. C. Turkentine was clerk of works.

Over the great gateway is a statue by Mr. G. Frampton, A.R.A., of Archdeacon Johnson, who founded the schools at Oakham and Uppingham in 1581.

The drawing is exhibited at the Royal Academy.

DECORATION OF A CHAPEL.

THE chapel of which the sections and plan are shown in the illustration, is now of unpainted plaster. The plaster below the entablature is to be cut down and the walls lined with polished Cipollino marble with a black marble skirting, the door dressings and overdoors are to be of the breccia sanguinea of Numidia, with black marble panels in the overdoor, the lower panel of which is to be inscribed and gilded. The archivolts and impostae are to be gilt, and the key-stones and trusses bronzed, the entablature is to be coloured and gilt with a gilt inscription on the dark blue frieze, and the pendentives, the dome, and the lantern are to be ornamented with painting and gilding. The architect for the work is Professor Atchison, R.A.

The drawing is exhibited at the Royal Academy.

NOTES ON THE CONSTRUCTION OF TOWN BUILDINGS.*

I PROPOSE to consider town buildings from the point of view, (1) of construction, (2) of materials, and last, but not least, of cost.

For dealing successfully with buildings like city banks, offices, warehouses, showrooms, and schools, regard must be had to—

1. Ample lighting to all parts;
2. Simplicity of plan and arrangement;
3. Good means of ventilation and warming;
4. Good sanitary accommodation and drainage;
5. Protection as much as possible from fire; and
6. The employment of suitable materials for the purposes for which the premises are intended.

I know full well how the difficult limitations of confined situations, poor frontages and numerous awkward angles, sites dominated by ancient lights and surrounded by detective rivalry or other walls, militate against the realisation of ideal requirements; but it is exactly at this point that the experience of a professional man comes into play, and gives

him his opportunity of showing how all these and many other difficulties may be overcome.

Construction.—How far do modern methods of construction forward these objects?

I have no hesitation in saying that upon the whole they do so to a very large extent. In former years town warehouses were built with extremely thick walls, floors of low elevation, with die square timber uprights and wooden beams supporting them, low windows with cast-iron frames, and basement floors laid on the ground, with no provision for keeping back damp, and with no proper sanitary arrangements. As for their external appearance, the least said the better. Doubtless there are many such buildings remaining in Manchester, as there are in the City of London, especially that part of the City near to the river. What is the case, however, to-day? All well-designed warehouses are built with as little unnecessary brickwork as possible, and with no internal walls where they can possibly be avoided; with floors of fair height and unencumbered by posts or columns as far as is practicable, and with proper lavatories to the open air in more than one floor of the premises. . . .

Our fifth requirement as named above (the protection of a building from fire) opens up the extremely large subject of what is a fireproof building, and with it the laws and regulations under which we have to work. This subject will be fully dealt with in the paper which Mr. Blashill has prepared for this meeting,* but I may be permitted to refer to it very briefly here. In London we practitioners have all been sent to school again in a large measure by the passing of the London Building Act of 1894, which came into operation on January 1, 1895, and superseded the Act of 1855. A short reference to the new Act as it affects the construction of buildings, will, I hope, not be out of place here. Buildings under this Act are classed under four heads:—

Dwelling-houses, domestic buildings, public buildings, buildings of the warehouse class. Among the regulations set forth, applying to "domestic buildings" erected after the commencement of the Act, Section 43 provides for sites which have been occupied by a domestic building (at any time within seven years previous to the commencement of the Act) by giving power to erect a new building on as much land as was previously occupied, if drawings of the previously existing building have been duly submitted to and certified by the District Surveyor. This section, I think, is of considerable advantage to building owners, as the District Surveyor's certificate is taken as conclusive evidence of the correctness of the plans, and therefore of the old buildings existing upon the site.

Under Section No. 47 no building is to be erected to a greater height than 80 ft. without the consent of the Council. Looking to the great height of modern structures, I think this regulation is a reasonable one. High buildings in towns create cold, draughty, and sunless streets. One of our finest improvements in London, Northumberland-avenue, always appears to me to be spoilt by the excessive height to which buildings have been carried up on either side of it. I regret I have not seen American cities, but the impression given one by photographs is that the extreme height of their buildings does not help either their architectural beauty or their convenience. I believe the wide streets and low houses in East London, and the suburbs of the large provincial towns, which allow of the free circulation of air and sunlight, add very materially to the general healthiness of the inhabitants.

The sections of the Act relating to cubical extent of buildings and the uniting of buildings are interesting:—

Buildings of the warehouse class are not to exceed 250,000 cubic feet unless divided by party walls, unless the sanction of the London County Council be specially obtained, and even then the area is not to exceed 450,000 cubic feet. If two or more buildings in one occupation exceed the cubical area above named, they can only be united by openings 7 ft. in width and 8 ft. in height, such openings being fitted with two wrought-iron doors, each $\frac{1}{2}$ in. thick in the panel, at a distance from each other of the full thickness of the wall.

The Fire Officers' Committee's Regulations exceed the requirements of the Act by insisting on chambers at least six feet in the clear being built in brickwork, with, of course, solid roofs and floors, and iron doors fitted to these.

After a careful survey of the recent great Cripple-gate fire, I am convinced that both the Act and the regulations above named should be varied as regards these iron doors. If openings are allowed to be made at all in a party or two external walls (and it would be a great hardship if they were not), the opening part when closed should be made fire-resisting as much as is possible, and this will never be so with such thin doors as above described. Over and over again fire has got through these doors, and better fire chamber doors should, in my opinion, be always specified.

The plans on the screen of a large series of warehouses and show-rooms I have just completed in Aldermanbury, City, show numerous connexions as described above, but I have fitted these openings with expensive fire-resisting chamber doors made by Messrs. Chatwood & Son, and I believe these doors will resist fire to a much larger degree than those which would have satisfied the Surveyors of the London County Council.

I have seen a copy of the Manchester by-laws, and I do not discover in them any provisions regarding the size of warehouses, and I am sure we shall all be interested to hear if I am right or not regarding this important point.

Section 78 deals with the construction of public buildings, which must be to the satisfaction of the District Surveyor, with powers of appeal in the event of disagreement to the Tribunal to which our Institution nominates a member, and all the members of which are connected with our Society.

The seventh and eighth parts of the Act I have not time to refer to in detail, although the latter part, defining the rights of building and adjoining owners, is important. Several new powers are given under this part in addition to those in the 1855 Act; amongst others the power to deal with party fence walls, the underpinning of adjacent premises (within 10 ft. of new buildings) upon terms, and these are, in my judgment, distinct aids to the building owner.

In the second schedule to the Act the materials are described which, for the purposes of the Act, shall be deemed to be fire-resisting, and among others we find that oak, teak or other hard timber not less than 2 in. thick is allowed for doors and stairs with 2 in. risers, and concrete composed of broken brick, stone, chippings or ballast, and lime, cement or calcined gypsum, when used for filling in between joists and floors.

I trust you will forgive me for trespassing upon your time with this very imperfect reference to a very important Act, but I feel it is the outcome of much thought and care, and applies to the construction of buildings in the largest of cities, and that it bears so directly upon the question of protecting property not only from bad building but from fire. We, as members of this Institution, shall always look back with pride to the part it took in the evolution of this Act of 1894. Not only did we spend nearly 1,000l. in so doing, but three members of our Council—Mr. Steward, Mr. Cubitt Nicholls, and Mr. Garrard (the latter two gentlemen, unfortunately, now no longer with us)—gave upwards of thirty days' gratuitous attendance in the Committee Rooms when the Bill was in Parliament.

The great fire in St. Mary Axe a few years since, and the still greater a few months ago in Cripple-gate, prove that there is still much to be done towards preventing such awful calamities in the future. The great lesson, I think, to be learnt from both of these fires is that iron-work, unless cased, is the most destructive of all agents when subjected to great heat, for columns and girders twist, buckle, and contort themselves into every conceivable shape, and by so doing wreck the premises they are designed to support.

I think it is a question deserving great consideration whether we should not omit from the external walls of buildings all hidden steel or iron girders and stanchions, and make these walls dead walls, capable of supporting themselves. We should be returning to a much simpler and, I believe, safer method of construction, and the space required for thicker walls or piers of brickwork should not be grudged when necessary for the safety of the building and the surrounding property.

If I am correct in this statement, many of the warehouses and showrooms built within quite recent years would come under this dangerous class. After the days of the old brick and timber structures, cast and wrought iron came to be largely used, often exposed, and there-

* A paper by Mr. Howard Chatfield Clarke, taken as read at the Manchester meeting of the Surveyors' Institution, on Wednesday, the 20th inst.

* Printed in our last issue, page 391.

fore formed an element of danger and risk from fire. After a heavy fire like the Cripple-gate one, it is useless, in my opinion, to suggest much wider streets in future, and fewer and less crowded buildings. The conditions of a town make this impossible, but it is possible to materially decrease the risk of fire by insisting—

1. That all party walls are carried up, say, at least 4 ft. above the slope of the roofs.

2. That all iron doors in party walls are of a much better description than now specified in the Act.

3. That all ironwork, both that exposed and all girders not exposed, are cased with plaster at least $\frac{1}{2}$ in. thick.

4. That party walls dividing skylights from adjoining buildings are carried up considerably higher than at present.

5. That external iron shutters are used in confined well-holes and areas overlooked by premises in several occupations.

In the warehouses in Aldermanbury (shown upon the screen) I have caused every piece of ironwork to be cased with plaster; and, with the fireproof chambers as described above between the various premises, I believe if one portion were a little there would be a good chance of saving the others.

One word regarding so-called fireproof floors. Their name is legion, and although I do not profess to have used a tithe of the various patents, I have used many, and believe a floor filled with good clean coke breeze, mixed in the proportion of five of breeze to one of Portland cement, makes a very rigid, light, and fire-resisting floor. I have drawn out details of such a floor, but I know there is nothing new in it.

To the construction of buildings such as banks, flats, offices, I think the leading requirements we have been considering in detail equally apply, but their actual construction must follow upon the special requirements of each. I always feel proper lighting to be the most important point. Some years back I commenced to use a special shaft for the lighting and ventilating of basements, trimming the ground floors generally in its darkest parts to enable this to be done. If the walls and slopes are built in white glazed bricks, I find that these areas make the parts near them in the basements practically as good as ground floor offices. The carrying up of all windows in town streets into the floor above that in which they are situated, and trimming the floor, has a most advantageous effect upon the lighting of premises, and often saves the loss of valuable space caused by the introduction of central well-holes through the various floors. Iron skylights and internal glazed partitions made in metal are also among more modern conveniences for properly lighting our buildings.

With regard to the proper ventilation and warming of buildings, both large and small, I feel we have still much to learn. I think it is generally admitted that when an amount of fresh air is introduced into a chamber, adequate to change the air thoroughly, draughts are almost unavoidable. The only simple remedy appears to me to be to distribute the inlets as much as possible, not to introduce them at too low a level, and to fit the apertures to them with metal or wood tops with conical-shaped holes, thus diffusing the air. With electric and other forms of fans for extracting vitiated air, this difficulty is largely overcome. For an ordinary room there is no better ventilation than the old-fashioned double hung sash, especially when it is fitted with a deep sill-board for the admission of fresh air at the meeting rail level. Grates fitted with warm air-chambers are a great boon both for winter and summer use, and are largely fitted in London, especially in the Board schools. The "Plenum" system, so much in use in the Midland Board schools, is doubtless also used here in the north. There is no doubt it is more costly to introduce in the first instance, but it ought to be economical in working as regards fuel. The great drawback appears to be the necessity for the constant attendance of the caretaker to regulate the supply of heat required in the various rooms.

My fourth requirement of good sanitary accommodation and drainage is a most important one in the construction of a building, and I believe it has never received the attention it is receiving to-day. The old fashion of laying drains at the last moment anyhow, and practically with any sized pipes that could be easily obtained, has given place to drains properly

laid, easily accessible, well ventilated, and generally made of glazed stoneware. I believe we all owe a great deal to the late Sir Henry Doulton for inventing—certainly for bringing to perfection—this simple but most useful material. The result of the improvement in drainage is shown in the health of the community, as although our large towns increase so rapidly year by year the general health is good and the death rates low. The use of iron pipes under dwelling houses has many advantages, the main one, I think, being that the number of joints, and therefore the number of causes for trouble, are largely done away with. The great want of public conveniences is at last receiving proper attention in London, and large, airy, and well-ventilated underground conveniences are now being erected by the London vestries, fitted with automatic flushing tanks and the most cleanly of all urinals, the "Stall" urinal. There is still in London strong opposition on the part of some of the water companies to allow water waste preventors to discharge more than two gallons. I am convinced from practical experience that this is not enough water to properly flush traps and drains, especially with certain forms of hopper closets, and my opinion is that three-gallon tanks should be in universal use, and that the companies should be compelled to supply water by meter to all public buildings.

The increased use of hot water is a source of trial to even the best lead wastes, and I find that strong iron wastes obviate much difficulty and prevent buckling.

I have already considered fully the fifth requirement, viz., the protection of a building as much as possible from fire. The last requirement, viz., the use in construction of suitable materials, alone remains to be considered. In towns, brick, stone, and terracotta, with a limited use of granite, are our main materials for external walling, and there is a better selection now of any of these materials to choose from than ever before. In town buildings the use of glazed bricks is of immense advantage, not only on account of their reflecting surfaces externally, but their sanitary properties internally. The manufacture and use of faience is also one of the greatest modern improvements giving room for artistic treatment both externally and internally, with a thoroughly practical material as regards resistance to dirt, and otherwise. The decay of the stone used in the erection of buildings in towns is a serious problem, and points to the necessity of protecting the material as much as possible from the atmospheric influences which attack it. This can partly be done by carefully jointing and covering exposed cornices and strings with thin lead, but the plain surfaces should be covered with "faute," or some similar solution, to further protect them. I am sure we must all be glad to see the further introduction into this country of granite, the most suitable material for many reasons for the erection of our town buildings. I have not time to describe in detail the many additions to our decorative materials for internal use, but the selection is large, and I should say never better than to-day. The cost of building fluctuates to such an extent that it is difficult to give reliable figures; but I append the cost per foot cube of some premises I have recently erected.

There are two very important classes of buildings which time has prevented my describing, either of which would supply material enough for a separate paper. I refer to schools and to dwellings for the working classes. The limited areas in cities has naturally forced architects to design schools in three floors, and hundreds of these are built throughout large towns, and upon the whole answer well. There must be, however, a considerable amount of time wasted in reaching the upper floors, and if the site will only permit I believe a separate building for the infants' department and a two-story building for the girls and boys answers very well, and will be found to be rather cheaper in execution. I have lately completed a school of this description for over 1,400 children in a London suburb, and the cost of this building, including all boundary walls, cookery kitchen, manual instruction-room, caretaker's cottage, &c., works out at 141.10s.3d. per child. The school is finished with glazed brick dados and buff bricks above throughout, and, little plastering, except for ceilings, has been used. I trust we shall hear in the discussion your views respecting this important class of buildings.

Regarding the housing of the working classes, immense strides have been made in London during the last thirty years, and many of the City Companies as well as the large trusts, such as the Peabody and Guinness, together with public companies, have done noble work in erecting healthy and well-built and well-lighted premises. During the last few years the London County Council have commenced to build this class of property, and I am bound to say I think their action in so doing has rather stifled and strangled private enterprise. The Council up to December last had spent over 387,000l. in erecting dwellings of this description, providing accommodation for 6,600 persons, exclusive of seventeen shops, 100 workshops, twelve stables, and twenty sheds. As, however, the Council are content if they see a return for their outlay of 3 per cent., I feel you will agree with me that, whether they are right or wrong in so using the ratepayers' money, they practically shut the door to private enterprise upon the same basis. The Guinness Trustees in their report of last year put the capital of their fund at 280,456l., and state that all their buildings continue to let well; that 7,327 persons were living in them; and that the average weekly rent of each room was 2s. 1d., which includes chimney sweeping and the use of venetian blinds, common-room, baths, and hot-water supply.

APPENDIX.

Examples of Cost of Building in London.

	Contents
Warehouses in Upper Thames-street. Brick front, wood floors, unplastered walls.	117,600 cub. ft. Cost per cub. ft. 7d.
Schools, Campsbourne, Hornsey. Boys' and girls' schools, stock and red brick front, internally walls finished with buff bricks and glazed brick dados, wood block floors and material stairs. Accommodation for 1,400 children.	Cost per cub. ft. 7½d.
Warehouses in Aldermanbury, for wholesale drapery trade. Fireproof floors, stone front, plastered walls.	Contents. 179,332 cub. ft. Cost per cub. ft. 1s. 1d.
City offices in Gracechurch-street. Stone front, fireproof floors, stone staircase, and hydraulic passenger lift, faience entrance and passages.	Contents. 304,870 cub. ft. Cost per cub. ft. 1s. 1d.
Residential flats, South Audley-street, Mayfair. Stone and terra-cotta front, electric passenger lift, fireproof floors, stone staircase, each flat finished with hardwood finishings, parquet floors, and enriched plasterwork.	Contents. 176,614 cub. ft. Cost per cub. ft. 1s. 2d.

THE SURVEYORS' INSTITUTION.

IN connexion with the visit to Manchester last week of the Surveyors' Institution, a dinner was held on Wednesday evening, the 20th inst., at the Grand Hotel. In the absence, through illness, of the President, Mr. Christopher Oakley, Mr. Robert Vigers, Vice-President, presided, and there were present amongst others the Lord Mayor of Manchester (Mr. Alderman Gibson), Sir Joseph F. Leese, M.P., Sir J. F. L. Rolleston, Vice-Chancellor Hall, the Dean of Manchester, Sir Leader Williams, Colonel Bridgford, and Messrs. Thomas Blashill, John Holden, John Ely (President of the Manchester Society of Architects), C. Bidwell, H. H. Collins, J. W. Fair, A. R. Stenning, A. Vernon, T. T. Wainwright, A. T. Walmisley, Daniel Watney, J. W. Penfold, Hon. Sec., and Julian C. Rogers, Secretary.

The usual loyal toasts having been honoured, the Chairman proposed "The Houses of Parliament," coupled with the name of Sir J. Leese, M.P., who responded.

The Chairman then gave the toast of the "Lord Mayor and Corporation of Manchester," and said that the members of his profession always experienced the greatest kindness in Manchester. Up to the present time the city had shone in the eyes of the world. All their great undertakings, with one exception, had been successes, and in the case of the Ship Canal he was sure it was only a question of time. It was one of the boldest undertakings a Corporation could have ventured upon. Manchester was certainly the most progressive city he knew; no other city exhibited the same courage in dealing with large enterprises for the general benefit of its citizens.

The Lord Mayor having replied, Sir John

L. Rolleston gave the toast of "The Legal Profession," Vice-Chancellor Hall responding. The Lord Mayor then submitted the toast of "The Surveyors' Institution." In the course of his remarks he said that the Institution secured a course of training through which a surveyor had to go which enabled him, with something like mathematical accuracy, to determine the value of all classes of property. He was glad that the Institution had honoured Manchester by selecting it as the place of their first country meeting.

The Chairman, in reply, said that the members of the profession felt proud of the Institution, which was the one centre to which they could rally. One object the Council of the Institution had kept steadily in view was the education of the rising generation, and they did it in their power to improve the minds of young surveyors, and enable them to follow with success the profession they had adopted. The pupils who were preparing to follow the profession were superior to those who had become surveyors in the early days. The Institution began in a very small way about 30 years ago, when their affairs were conducted in a small room. They now numbered about 1,000 members.

Mr. Arthur Vernon then proposed "The Counties Palatine Provincial Committee," thanking the County Palatine for its efforts in regard to the meeting, and Mr. John Holden, the Chairman, in particular. In regard to Manchester, great as it was there was still room for improvement: the streets were terribly noisy, and were badly paved, and the people were extraordinarily modest in their ideas as to the architecture of churches and chapels.

Mr. John Holden replied, and subsequently proposed "The Guests," the Dean of Manchester responding.

The Dean then proposed the health of the Chairman, who, in reply, said he greatly regretted the absence of the President, Mr. Wakley.

A hearty vote of thanks was then accorded, in the motion of Mr. Wainwright, to the secretary, Mr. Julian C. Rogers, for his efforts in regard to the meeting. Mr. Rogers briefly replied, remarking that for thirty years, with their hon. secretary, Mr. Penfold, he had been associated with the Institution. He hoped that that meeting was the first of many successful provincial gatherings of their Institution.

VENTILATION OF THE ART GALLERY, BURY.

THE warming and ventilation of this new building has been put into the hands of Messrs. Sutcliffe & Co., of Manchester, who propose to adopt what is known as a low-pressure plenum system of ventilating and warming; and the work, therefore, will be one more illustration of the advance which is rapidly being made in England towards the satisfactory ventilation of public buildings. As with many other examples, the warming is to be done by what is called in America indirect acting apparatus—that is, the warm air is raised to the necessary temperature outside the room into which it is to be introduced, the principles on which Messrs. Sutcliffe & Co. carry out their work have been explained in a paper read before the Manchester Society of Architects by Mr. J. D. Sutcliffe, in which, though there is a great deal that is true and trustworthy, there are also some statements and theories to which we take exception. One of these is the argument that because carbonic acid gas is 52 per cent. heavier than air it is therefore desirable to ventilate by a downward current in a room rather than an upward one. The fallacy of this will be obvious to every one of our readers who smokes, if he will notice the course of the smoke after being exhaled. It is almost impossible in an ordinary room to make the smoke go down to the floor without a very violent effort. In all ordinary expulsion it would be noticed that the smoke ascends, and quickly becomes disseminated through the air of the room. The scientific fact is that air exhaled from the lungs is, at the moment of exhalation, equal in weight to pure air at a temperature of 90 deg. Fahr. And until the exhaled air has parted with so much of its heat as to become heavier than pure air at this temperature, it will rise in a normally pure atmosphere. There is no doubt that with the modern idea of forcing in fresh air at a high level, and allowing it to pass out at or

near the floor level, the incoming air is likely to traverse the greater part of the lower portion of the room. But the air at the moment of being breathed will be the foulest of which the amount of ventilation given to the room admits. The question, therefore, resolves itself into this: that if the ventilation is sufficiently ample to keep the foulest air in the room in a minimum state of impurity, downward ventilation may be permissible. But if, as is generally the case in England, the amount of fresh air introduced into the room is only a proportion of this necessary minimum, then upward ventilation, combined, of course, with a proper distribution of the air inlets, will render the air that is being breathed the purest of that in the room, instead of the foulest.

Mr. Sutcliffe holds that in any scheme of ventilation the amount of air and the temperature should be under the control of the person or persons occupying the room, and for this purpose he adopts what he calls the double duct system, providing, that is, a cold air supply and a warm air supply to each room, the amount of air admitted from either being under the control of the occupant. There is a good deal to be said in favour of this view; it has, however, the disadvantage that the engineer or person in charge of the central heating apparatus is not usually fully cognisant of the varying demands that are being made from time to time on the heating apparatus. Mr. Sutcliffe mentions the ventilation of the new factory at Coventry for the Pneumatic Tyre Company. This is an example of the method we should like to see adopted in all public buildings: a combination of the so-called plenum and vacuum systems, in which the fresh air is propelled into the room by a fan or fans, and the foul air is drawn out from the room by other fans. This is the only system by which perfect control and entirely adequate ventilation can be obtained, and is that adopted now in the best instances of well-ventilated public buildings on the Continent. It is, of course, the most expensive, but it is also certainly the most effectual, and gives the best value for the money expended. Mr. Sutcliffe lays it down as an axiom that the rate of air motion through the air inlets into the room should not be more than 5 ft. per second. This is, in our opinion and in that of good authorities, too much; and 2 ft. per second is far preferable. Indeed, a current of 1 ft. per second is just perceptible to the skin. So high a rate, therefore, as 5 ft. per second is liable to be unpleasant unless the temperature is very carefully and exactly regulated.

Messrs. Sutcliffe & Co., like many other of their competitors in trade, have patented a form of ventilating-fan, somewhat resembling the well-known Blackman fan; but we very much doubt whether it is possible to devise a form of fan affording good grounds for a valid patent that is superior to the straight-bladed fan with cone centre, which it is open to anybody to construct. In the present state, however, of ventilating engineering a patent seems to be a necessity from a trade point of view. Messrs. Sutcliffe claim that their form of fan runs absolutely quietly. If this claim is borne out by facts, we can congratulate them on having achieved a very notable victory.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL SOCIETY.—The Edinburgh Architectural Society met on the 20th inst. to hear a paper by Mr. T. Duncan Rhind on "Sculpture in Relation to Architecture." Mr. A. Lorne Campbell was in the chair. The lecturer, after lamenting the want of sculpture in modern work, and attributing it to the ideas of building committees and the schools of art, traced the history of sculpture in connexion with architecture, claiming that that was its highest branch. Mr. Rhind praised the present French school and system of encouraging sculpture.

COMPETITIONS.

JUBILEE CLOCK TOWER, LEWISHAM.—On the 10th inst. the executive committee of the Queen's Jubilee Commemoration Committee for Lewisham met at the Town Hall, Cardiff, to consider the designs submitted in competition for the clock tower to be erected at the junction of the High-street, Lewisham, and the High-road, Lee, with the result that the design bearing the letters "V.R." was selected. The successful architect was Mr. Gough, of Bristol.

The design is for a tower some 50 ft. in height, and 8 ft. square at the base, which will be surrounded by a 3-ft. kerf, forming a refuge. The tower will be built of Bath stone, the facing of the spire only being in freestone, and the backing will be of cement concrete. At the base a medallion of her Majesty is surmounted by the Royal arms, beneath that being a panel for inscription. Columns at the angles terminate in a crown design, as does the central cupola or spire. There are to be four dials, each about 4 ft. in diameter.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The tenth meeting of the Session was held at 32, Sackville-street, Piccadilly, on the 20th inst., Mr. C. H. Compton, V.P., in the chair. Some further particulars of the ancient font recently discovered at Bassingham, Lincs., were contributed by the Rector, the Rev. W. A. Matthews, through Mr. J. T. Irvine, accompanied by an excellent photograph. The font has been thoroughly cleaned and placed where it will no longer be overgrown with shrubs and vegetation. A paper by Mr. Geo. G. Irvine upon the very curious church and well of St. Donlough, co. Dublin, was read by Mr. Patrick, Hon. Secretary. The church, situated about eight miles N.E. of Dublin, at one time was the centre of a considerable village of which many ruined dwellings remain. There is also a very good plain granite cross of early type at the cross roads leading to the church. The ground plan of the church is in two divisions, the easternmost being much the larger, vaulted and groined, but without ribs. A modern church adjoins it on the north, from which it is now entered, although there was most probably an external door on that side originally. In a recess formed by one of the windows in the south wall is a very curious staircase leading up to a long room which runs the whole length of the building forming an upper floor. The walls of the church are carried up, forming a square tower in the centre with embattled parapet. The eastern portion of the ground floor is 14 ft. 6 in. to the crown of the vault, but the western portion is in two heights, a priest's chamber occupying the upper part and rising into the long chamber above, where it forms a raised floor of four steps. There are several stairs leading to various parts of the building and to the tower, and the whole arrangement is quaint in the extreme. The church dates probably from the beginning of the thirteenth century, and is one of a very interesting type of buildings peculiar to Ireland. The well is situated to the north-east of the church, and is in character with it. There is also a curious underground chamber, roofed with a circular barrel vault, and approached by a very narrow flight of steps from the ground level. It was probably the baptistry.—Mr. J. C. Gould drew attention to an ancient cross, a holy well, and baptistry, together with an interesting church, at the village of St. Clear in Cornwall, and mentioned that in the tower was suspended a ringers' board bearing some quaint lines.

Correspondence.

To the Editor of THE BUILDER.

WALTHAM ABBEY.

SIR,—May I add a few words to your article of April 2 on Waltham Abbey Church? I, a great cloud of witnesses, Professor Freeman, Bishop Stubbs, Mr. T. Wright, Mr. W. Burges, and others have attributed the present nave to Harold, A.D. 1062. If so, it would be either Anglo-Saxon or Early Norman in character. It is neither. In scale, design, and execution it is altogether beyond the scope of Anglo-Saxon work. Nor, on the other hand, can it be of the same date as the archaic eleventh century work of the south transepts of Hereford and St. Albans, the north transepts of Chester and Winchester, the west front of Lincoln. A second school asserts that the nave was built at the refoundation of the Abbey for Canons Regular in 1177; this would make it contemporary with the transitional work of Canterbury, Chichester, and Abbey Dore, which is manifestly impossible. The stones and mortar tell their own tale, and that quite unmistakably. It is obviously a contemporary of Southwell nave and the like, built, therefore, in the latter half of the Norman period, c. 1120. In 1120 Henry I. gave Cornhill and Northfields to the Abbey. The author of the "Vita Haroldi" speaks of works going on in the church in 1125 and 1126. There are, moreover, many resemblances

between Durham and Waltham, due to the fact that Waltham was given to Bishop Walcher after he was appointed to Durham in 1071. Durham choir was finished c. 1096. Waltham, like Lindisferne and Dunfermline, is a later copy of it. 2. The triforium, as at Rochester and Vignory, is merely a wall with holes in it. Originally, however, the aisles were vaulted. Traces of the supports of the vault may be seen along the aisle walls. 3. Early in the fourteenth century it was resolved, as at Gloucester, to improve the nave. At Gloucester the two western bays were entirely rebuilt. At Waltham they were not rebuilt, but pier-arcade and triforium were thrown into one story. And as it was probably intended to apply the same process to the whole of the nave eventually, the arcade of each bay of the triforium was taken out, as well as the string-course below it. When it was found impossible to carry out the remodelling of the whole of the nave, this string is said to have been replaced in plaster. And so Waltham has no vault to its aisle, no arcade to its triforium, and no string to its triforium except one of plaster. The cut stone collected from the vaults and vaulting-shafts in the aisles, from throwing into one the pier-arcade and triforium of the western bays, and from the arcade and string of the triforium, seems to have been utilised by the canons in building the new curvilinear façade. FRANCIS BOND.

TRIBUNAL OF APPEAL CASE.

SIR,—We notice that in the issue of the *Builder* of the 23rd inst., p. 307, in the report of an appeal under the London Building Act, 1894, by the Lion Brewery Company, Limited, the solicitors to the appellants are stated to be Messrs. J. White & Leonard. We beg to inform you that we, and not Messrs. J. White & Leonard, are the solicitors to the company, and must ask you to be good enough to insert a correction in this respect. The matter is of some importance, as we have been the solicitors for the company for many years past. The error may have arisen from the fact that Messrs. White & Leonard initiated the appeal under the instructions of our clients' architects. The appeal was, however, prosecuted by ourselves on the company's behalf. LAYTON, SONS, & LONDON.

BOOKS RECEIVED.

TRANSACTIONS OF THE MONUMENTAL BRASS SOCIETY. Vol. III. Part 2. (John Bale, Sons & Danielsson.)
THE ART OF ENGLAND AND THE PLEASURES OF ENGLAND. By John Ruskin. (George Allen.)

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XVIII.

CALCULATIONS for the strength of arches and their abutments may be made either by the use of formulæ or by graphic methods. But in both cases the theory on which the practical calculations are based can hardly be said to be in a very satisfactory state, as the basis which has been taken as a starting point in the theoretical investigation of the statics of arches is that arches are composed of a number of smooth voussoirs which are free to slide upon each other, and very few investigators have taken account of the practical effect that in building arches are usually put together with mortar or cement between the joints, which, especially when properly set and hardened, has a considerable influence in strengthening the construction. Fortunately, the error, if any there be, in the theory, is on the right side, and the point which is not taken into consideration adds to the strength of the construction instead of detracting from it. We may, therefore, content ourselves with accepting the formulæ and methods which have been arrived at.

In order that an arch may be stable, it requires to be sufficiently strong in several particulars: first, the pressure upon the arch must be met by a sufficient resistance from the arch to prevent the arch losing its true form by rising at one or more parts, or sinking at other parts. This, in theory, is the manifestation of certain of the voussoirs turning upon either their inner or outer edge. It results from insufficient depth in the arch from extrados to intrados, and is intimately connected with the curve of pressure or line of resistance—terms which we shall hereafter explain; second, the pressure upon any part or, in theory, any joint of the arch must be less than would be sufficient to crush the material of which the arch is composed; third, the abutment must be sufficient to resist the thrust of the arch.

The form of the arch has a considerable influence upon the manner in which it will be

likely to fail if the first of these essentials is not sufficiently fulfilled. A semi-circular arch is most likely to fail by the crown falling in and the haunches rising; a pointed arch, on the other hand, is more likely to fail by the crown or apex rising and the haunches falling in. A straight arch is most liable to fail by sagging or falling in by the voussoirs sliding upon each other. As a matter of practical building, therefore, a semi-circular arch should be used when the load on the haunches is great and that on the crown is small. A pointed arch should be used when the load on the apex is great and that on the haunches comparatively small.

The following formulæ are used for determining, with more or less accuracy, the proportion of the parts of an arch; $D = C \sqrt{R}$, where D is the thickness at the crown, R the radius of the arch at the crown, and C is a constant whose value is given as '3 for stone, '4 for brick and '45 for rubble. This formula is said to be applicable when the arch is not less than 40° . In the case of a straight arch with radiating joints the formula is altered to

$$D = .45 \sqrt{s + \frac{s}{12}}$$

where s stands for the span of the arch.

Another theory gives

$$D = \sqrt{R + \frac{s}{2}} + .2 \text{ ft.}$$

This is said to apply for first-class workmanship in cut stone. If the work is of less careful description, this depth should be increased by about one-eighth part, and for brick or rubble about one-third. In all of these examples of formulæ it will be noticed that no difference is made by the formula whether the load upon the arch be small or great, live or dead; they can, therefore, be regarded only as approximations to be afterwards tested by more careful calculations. We have also some empirical formulæ for the thickness of the abutment, thus:—

$$T = \sqrt{2P + \left(\frac{A}{H}\right)^2} - \frac{A}{H}$$

where T is the thickness of the abutment, P the horizontal thrust, which is considered to be nearly equal to the weight of that part of the arch between the crown and an angle of 45° , A is the area of section of the half arch, H the height of the abutment to the springing. This is a more logical formula than those we have quoted above. Another formula for the abutment is more simple, but less logical. It is:—

$$T = \frac{R}{5} + \frac{r}{10} + 2.$$

Here R is the radius in feet, r the rise in feet, and the resultant thickness of abutment, T , is also in feet. This is said to apply when the height of the abutment does not exceed one and a half times its base.

For practical work it is more satisfactory to adopt a graphical method of estimating the stresses in an arch. If we take for the pur-

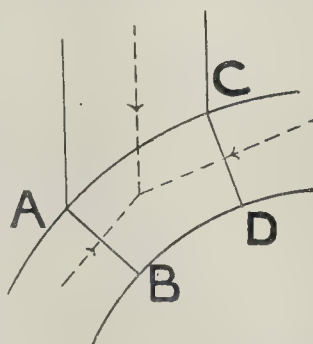


Fig 1

poses of investigation any voussoir, $ABCD$, of an arch, as in Fig. 1, it is clear that such voussoir, when in equilibrium, is so kept by the united action of three forces, which are, first,

the load on the voussoir, in which its own weight should be included, and which will be acting vertically downwards through the centre of gravity of the voussoir and its load; second, the pressure upon the upper surface, CD , of the voussoir, of the load brought by the part of the arch (with its load) immediately above it; and, third, the resistance of the voussoir or abutment on which the lower edge, AB , is resting. These forces in our diagram are indicated by dotted lines and arrows.

In the case of each voussoir, the resistance of the voussoir below it becomes, when we investigate the next voussoir downward in the series of which the arch is composed, equal and opposite to the pressure exerted by the part of the arch above, as at the joint A, B , and since in each voussoir the pressure brought upon the upper joint by the load of the arch above it is modified by the action vertically downwards of the load upon the voussoir, it will be at once seen that the lines representing the pressure brought by the parts of the arch to any voussoir in the series are gradually approaching more and more nearly to the vertical as we deal with each successive voussoir. And if we divide the arch into a very large number of very small voussoirs these deflected lines would be each of them very short in length, and so approximate to a curved line. This curved line is called the curve of pressure, or, sometimes, the line of resistance; both terms being equally correct, as it shows, on one hand, the direction in which the pressure from the upper parts of the arch is transmitted to the lower, and, on the other hand, the direction in which the resistance of the lower parts of the arch is afforded to the upper.

If we suppose, as indicated in fig. 2, that in some one voussoir, $EFGH$, the line of pressure

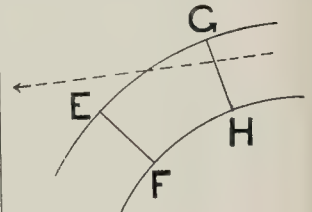


Fig 2

passed outside the upper edge of the voussoir, it is clear that we should have a force acting about the point E , and tending to turn the voussoir about that point. The arch would, therefore, open at the point F , and fail by the voussoir turning about the point E . If, on the other hand, as in fig. 3, the line of pressure

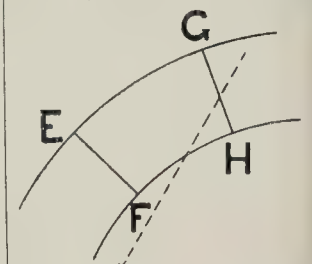


Fig 3

were to pass through the lower edge of the voussoir $EFGH$, we should then have a force tending to turn the voussoir about the point F , and the arch would open at the point E .

It is clear, therefore, that in order that the arch may be sufficiently strong for its work it is essential that the curve of pressure should be within the depth of the voussoir. And in order that the arch may be quite safe, the curve of pressure should be well within the depth of the voussoir. Exactly how far within the depth of the voussoir is a matter of purely arbitrary determination, though many writers have recommended that the curve should be within the middle third of the arch; that is, i

ould never approach nearer to either the trados or the intrados than one-third of the pth of the arch. Such requirement is, however, probably too severe, and does not take account of the adhesion of the mortar or cement. We should therefore be safe enough requiring that our curve of pressure should be within the middle half of the arch, that is, should not approach nearer to the extrados or trados than one-fourth of the depth of the arch.

OBITUARY.

M. GUSTAVE MOREAU.—The Academie des Beaux-arts has experienced a fresh loss by the death of Gustave Moreau, professor at the Ecole des Beaux-Arts, at the age of seventy-two. The son of a Government architect, M. Moreau was educated in the atelier of Picot. He made his first appearance in the Salon in 1852, by a "Pieta" which attracted a good deal of attention. The following year he exhibited a very large picture, the subject taken from the Song of Solomon, which was purchased by the State and presented to the Museum of Dijon. He obtained a great success, at least, after having exhibited in 1864, by a picture of Edipus and the Sphinx, a mythological work very novel in its idea and treatment. From this date he adopted symbolic and legendary subjects of this kind as his special province: "Jason," "Le Jeune Homme et le Mort" (1865); "Diomedes devore par ses Chevaux" (1866); "O-On" (1867); "Prometheus" and "Europa" (1868); "Hercules" and "Hydra" (1869); and "Salome" (1870); "Galatea" and "Helen" (1880), after that date he ceased to exhibit, and worked not infrequently among his pupils at the Ecole des Beaux-Arts, by whom he was greatly beloved and respected both for his ability and his high character. He was never a popular painter, and for the last fifteen years even avoided all public notice, but he leaves the reputation of an artist of great and individual power.

MR. R. C. DRIVER.—The death of Mr. Robert Collier Driver, senior partner of the firm of Driver & Co., took place at his residence, 182, Cromwell-road, S.W., on the 13th inst., after a long and painful illness. The deceased was born in the year 1816, and having served his articles in the office of Messrs. Marmonts, of Bristol, joined the firm of Driver & Co., then carried on by his three uncles, about the year 1848. A few years after, the deaths of the three partners of the firm threw the management of the business upon him. He was joined by his two sons and his son-in-law about thirty years subsequently. The deceased gentleman occupied a foremost position in the surveying profession. He was among the promoters of the Surveyors' Institution, of which he was a Past President, and he founded a prize of the value of 15 guineas for the highest number of marks in the examination for non-student candidates for the class of professional associate of the Institution. For forty years he held the post of treasurer and secretary to the Land Surveyors' Club; he was also a member of the Board of the Auctioneers' Benevolent Fund. He was Deputy-Lieutenant of the City of London for many years; Burgess of Westminster; Member of the Court and Past Master of the Worshipful Company of Clothworkers. He was also Vice-President of the Charing Cross Hospital. The funeral of the deceased gentleman took place at Brompton Cemetery on the 19th inst.

MR. W. H. BRACKSPER.—The death is announced at the Priory, Corsham, Wiltshire, of Mr. Wm. Hay Bracksper, architect. The deceased was seventy-nine years of age.

MR. W. COWELL.—Mr. William Cowell, of the firm of Messrs. Caldecott & Cowell, joiners and builders, Liverpool, died at his residence, Brompton-avenue, Egrement, on the 26th inst.

GENERAL BUILDING NEWS.

RECONSTRUCTION OF THE PARISH CHURCH, WOMBWELL, YORKSHIRE.—On the 21st inst. the Lord Bishop of Beverley consecrated and opened the nave of the new Parish Church of St. Mary's, Wombwell, which has recently been completed at a cost of about 5,000l. The scheme for the reconstruction includes a nave, with aisles, chancel, and western tower and spire, but the funds in hand would not permit the whole of the scheme being proceeded with, and so far only the nave of the new building has been completed. The nave is 90 ft. long, with a clear width across of 55 ft., and the height of the roof is 40 ft. The aisles are divided from the nave by arcades of Bath stone. There are large clearstory windows in the upper portion of the nave. In the chancel arch an oak altar has been placed. On the north stands a stone pulpit, which has a face of Dove marble, and a marble capping. In the three front panels the Transfiguration has been carved, after the design of Mr. C. M. Hadfield, by Messrs. Boulton & Sons, of Cheltenham, who also carved the choir. The church floors are laid with polished black and white marble. The building is warmed on the low-pressure hot-water system, by Haden, of Manchester. The work

has been carried out by the contractor, Mr. George Webster, of Sheffield, the architects being Messrs. Hadfield & Garland, of Sheffield, Mr. T. Cook, of London, acting as clerk of the works. The church, as it at present stands, has sitting accommodation for over 700 people.

THE RESTORATION OF PAISLEY ABBEY.—A meeting of the valued restorers was held in Paisley Abbey on the 15th inst., when they gave general approval to the proposals for the restoration, and authorised the various superintending committee to consult with the restoration committee as to plans, &c., and to report when detailed plans and estimates for the commencement of operations had been completed. Dr. Rowand Anderson has been engaged as architect, and with his assistants has been conducting excavations to determine the stability of the foundations throughout the choir and the four piers which carry the central tower. These were all found to be in a satisfactory condition. It is pointed out that there will be no disturbance of graves in the restoration operations in the choir and transepts.

NEW CHURCH, LONGTON, STAFFORDSHIRE.—The foundation-stone of a new church to be erected at Sandford Hill, Longton, as an offshoot from the old church of St. John, has just been laid. The church is Early English in design, and will be built of red brick, with stone dressings. It will consist of a nave of five bays, chancel of two bays, Lady Chapel on the north side of chancel, and an organ chamber on the south side. Over the chancel arch will be a bell turret. The architect is Mr. J. Martin Brock, of Grantham. The first cost is estimated at 3,500l., with accommodation for 500. The plans provide for an enlargement at a total expenditure of 5,500l.

CHURCH OF EMMANUEL, SOUTHPORT.—The new Church of Emmanuel, which has been erected in Southport, has just been consecrated. The interior dimensions are 104 ft. from west to east, 66 ft. across nave and aisles, 104 ft. across transepts, and 50 ft. from floor to ceiling of nave and chancel. Five arches on each side separate the nave from the aisles, and two more the aisles from the transepts. A narthex terminating in north and south porches, with a western porch in the centre, extends across the west end of the nave and aisles. There is an external entrance near the south transept, adjoining which is the baptistry. The chancel consists of the choir and the sanctuary, and above the former, carried on four arches, is the great central tower, 30 ft. square. The sanctuary is east of the tower in the east wall of which is a window of five lights, filled with stained glass, by Mr. Kemp, the centre light being double the width of the others. The interior is of oak. The centre panel contains a representation of "The Last Supper," in opus scutelle by Messrs. Powell & Sons, of London. The sedilia and credence are arranged in the panelling on the south side, the former having a projecting carved canopy. The Holy Table and sedilia are of oak, designed and carved in keeping with the surrounding work. The floor of the chancel is of mosaic. The choir stalls and prayer desks, which are of Dantzic oak, have traceried fronts and are carved. On the north side of the chancel is an organ chamber. On the south side is a transept, forming the western portion of a future chapel, according to the original design. The only other incomplete portion of the church, except the tower, are the vestries, which are to be built behind the organ chamber. The pulpit is constructed chiefly of selected Derbyshire alabaster, but the shafts, strings, and base are of dark Ashburton marble. The font is of Caen stone. The floor of the baptistry is of mosaic, while light wrought-iron dwarf screens (with gates) divide the baptistry from the aisle (with gates). The lower part of the walls of the building, inside, is faced with Accrington red bricks, and the upper with Aston Hall buff bricks, while the dressings are mostly of Accrington terracotta, with columns and piers of red sandstone from the Liverpool district. The roofs are all open timbered and boarded. The church outside is faced with Accrington red bricks, and the dressings are of red sandstone. The style is Early Perpendicular. The contractors for the foundations were Messrs. Wishart & Irving; for the superstructure, Messrs. Fairbridge & Hatch, both of Southport; for the chancel woodwork, Messrs. Pearson & Brown, of Manchester; for the pulpit and font, Messrs. Erp & Hobbs, of Manchester and London, who have also executed all the carving throughout the church. The electric lighting is by Messrs. Calvert & Co., and the heating by Messrs. Haden & Sons, both of Manchester. Mr. J. E. Wildman has acted as clerk of the works, and the whole has been carried out from the designs and under the superintendence of the architect, Mr. R. Bassett Preston, of the firm of Messrs. Preston & Vaughan, of Manchester.

MISSION HALL, LINCOLN.—A new mission hall has been recently finished on the Monk's-road, Lincoln, in connexion with St. Swithin's parish. The architect was Mr. Fowler, of Durham, and the edifice has been built by Mr. M. Otter, of Lincoln. The building is of red brick.

TOWER AND SPIRE, SALTBRUN PARISH CHURCH.—A meeting of parishioners and subscribers was held recently to consider two alternative designs for a proposed tower and spire. On the recommendation of the sub-committee, it was resolved to adopt the design for one at the west end at an approximate

cost of 2,500l. It was further resolved to ask the architects, Messrs. Clark & Moscrop, Darlington, to invite tenders as soon as possible.

CATHOLIC CHURCH, BURTONPORT, STRABANE, IRELAND.—The foundation stone of a new church has just been laid at Burtonport. Mr. Joye, of Derry, is the architect. The contract for the work has been entrusted to Mr. McCaffrey, of Strabane.

CATHOLIC CHURCH, TULLYALLEN, NEAR MELLIFONT, IRELAND.—The foundation stone has just been laid of a new church at Tullyallen. The church, says the *Freeman's Journal*, will be in the same style as the Abbey church, with round-headed windows, semicircular arches, and the characteristic Celtic ornamentation of spiral beads and zig-zags in its mouldings. The frontage is flanked at its northern side by a campanile tower, surmounted by an octagonal spire with cross. The tower is in two stories. A cornice is carried round the tower below the bell-loft. The tower will rise to a height of 88 ft. The height of the frontage to the roof-ridge will be 35 ft. The building will be cruciform, consisting of nave, chancel, and transepts; four windows at either side will light the nave. The transepts will be lighted by a large rose window on each gable and lesser cinquefoil windows in the sides. The length of the church will be 122 ft., the width across the nave 28 ft., and the depth of each transept 14 ft. The sanctuary will measure 27 ft. by 24 ft., and will have an apsidal ending with windows filled with stained glass. Provision is made for two sacristies. The interior of the church will be furnished in keeping with its architectural outlines. The cost of the building, apart from the interior fittings, will be 3,400l. The architect is Mr. W. H. Byrne. Mr. James Wynne, Dundalk, has the contract for the erection of the building. The old church is in an almost ruinous condition. The walls are cracked and the timbers of the roof are decaying. There was little foundation excavated for the walls, which are consequently giving way. The site of the new church is within the old grange of the Abbey of Mellifont.

CATHOLIC CHURCH, GLOUNTHANE, CORK.—The new church at Glounthane was dedicated on the 24th inst. The church has been built to accommodate 1,000 people. The architect was Mr. Samuel P. Hynes, Cork, and the builder Mr. J. J. Coffey, Middleton. Mr. C. O'Toole was clerk of works.

PRIMITIVE METHODIST CHURCH, LEICESTER.—The foundation-stone has just been laid of a new Primitive Methodist Church at Leicester. The building now in course of erection comprises a church, Sunday-school, and minister's house. The site faces the Hinckley and Fosse-roads and Livingstone-street. The church will accommodate 1,000 persons—600 on the ground floor, and the remainder in the gallery. The pews are circular, radiating from the rostrum. The body of the church is 47 ft. wide, with transepts 6 ft. deep at each side. The orchestra is seated for 100 persons, and is at a lower level than the main gallery. The windows are stone with tracery work, and glazed with leaded lights in tinted cathedral glass. The schools are arranged in three departments. The large assembly-room is on the ground floor, and is 41 ft. wide by 78 ft. long. The institute assembly-room is on the first floor, and is 60 ft. long by 30 ft. wide. There are also rooms for the young women and the young men respectively, and sixteen other large class-rooms. Each department has its own male and female annex, with lavatory accommodation, the walls of which are lined with glazed bricks. The walls are faced externally with best pressed bricks, with white Hollington stone dressings. The staircases are of Yorkshire stone, with glazed brick dados. The style is Gothic. The woodwork throughout is selected pitch pine, varnished. The floors are paved with wood blocks, and the rooms will have fresh-air inlets and extraction flues. The warming will be by hot water, and the lighting by incandescent gas-lights. The architect is Mr. Harper, of Nottingham. The builders are Messrs. Langton & Son, of Enderby.

HILL CONGREGATIONAL CHAPEL, SWANSEA.—A new Congregational chapel has just been erected at Swansea by Mr. Thos. Davies, from plans prepared by Mr. Wm. W. Williams, providing seating accommodation for 500 persons. The new chapel has cost 1,400l.

WESLEYAN CHURCH, MARDEN, YORKSHIRE.—Sir James Kitson, Bart., M.P., opened at Marden, on the 8th inst., the enlarged Wesleyan Methodist Church, and a new Sunday-school and a new suite of vestries. The main front of the church faces Brougham-road. The school-room is on the ground floor, the vestries at the sides, and the chapel on the first floor. In 1872 the building consisted of a chapel, with a small north gallery on the first floor, an assembly-room, and five class-rooms on the ground floor. The alterations lengthen the chapel and increase the sitting accommodation by about 130 sittings. An organ recess is provided, choir pews, minister's vestry, choir vestries, and lavatory. The additions to the school consist of a young men's class-room, 33 ft. by 21 ft.; a young women's class-room, 26 ft. by 21 ft.; four other class-rooms, an addition of 15 ft. to the length of the assembly-room, a kitchen with lift, heating chamber, and stone staircase, vestibule, and school entrance. The school accommodation is increased in space for 220 additional scholars. Local stone has been employed in building the additions, which

have been made to correspond with the main body of the church. The architects have been Messrs. John Kirk & Sons, of Huddersfield and Dewsbury, and the total outlay on the alterations and additions represents a sum of 2,000l.

FREE CHURCH, MACDUFF, BANFFSHIRE.—Plans prepared by Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen, for the new Free Church and hall for Macduff have been sanctioned. The building is to be erected at the corner of Duff-street and Clergy-street, and will be of limestone ashlar, with freestone dressings. The principal entrance will be from Duff-street by a doorway in the base of the tower. Measuring 15 ft. square, the tower is about 100 ft. high to the weather vane on the top of the steeple. To a height of 65 ft. the tower is square, and above this rises a slated steeple. The upper portion of the tower affords accommodation for a clock and bell. The church will be provided with 587 sittings; and, in view of the fall in the ground on the Clergy-street side, it has been found possible to make provision for a large hall under the church, for meetings and Sunday school purposes.

WESLEYAN CHAPEL, MEERSBROOK, SHEFFIELD.—The Wesleyan Methodists of Sheffield have embarked upon a new building scheme at Meersbrook Bank, where a school chapel is being erected in connexion with the Brunswick Circuit. The chapel is situated at the corner of Derbyshire-lane, Norton Lees-lane, and Cockayne-place, and is being built to plans prepared by Messrs. Hemmell & Paterson, of Sheffield. Accommodation will be provided for between three and four hundred persons. The outlay on the present building is estimated to be 1,600l.

BOARD SCHOOL, GLEADLESS, YORKSHIRE.—A new Board school, which has been erected at Gleadless, was opened recently. The school will accommodate 300 boys and girls and 180 infants, and has been erected at a total cost of 4,377l. 9s. 9d. The premises consist of four class-rooms on the upper floor, and a similar number on the upper floor. There are separate entrances for the boys, girls, and infants. The architect was Mr. J. D. Webster. All the work has been done by Sheffield tradesmen. Mr. Aaron Moore was the contractor, Messrs. Badger & Sons executed the joinery, Mr. C. Hickson the plumbing, Messrs. C. Chadwick & Sons the plastering and roofing, and the heating apparatus was put in by Messrs. Wright Bros.

ADDITION TO ARDRECK ACADEMY, CRIEFF.—An addition is to be made to this building on the south side. The building work of the new wing has been entrusted to Mr. Ellis, builder, Crieff. The architect is Mr. G. T. Ewing, Conraig.

ORANGE HALL, WEST BELFAST.—This new building, which is situated on the Shankill-road, has a frontage of 46 ft. 8 in., and extends from front to back along Brookmount-street 105 ft. From the front entrance vestibule a corridor, 6 ft. wide, runs down the centre. The front entrance vestibule contains the staircase to the large hall, and behind, on the left, the lodge and ante-rooms, while on the right are the reading, arch, ante, and box rooms, as well as back staircase, lavatories, hall, kitchen, yard, and at the further end a house for the caretaker. A wide stair at the front and another at the rear give access to the large hall, which is 62 ft. long, including gallery, and 36 ft. wide. In the front there is a gallery about 12 ft. wide, having stewards' room under, movable platform at end of hall, and ladies' and gentlemen's retiring-rooms at the rear. The architect was Mr. William Batt, of Belfast, and the works were carried out by Messrs. Campbell & Lowry, contractors.

NEW LIBRARY, HOXTON.—A Public Library in Pittfield-street, Hoxton, was opened on the 20th inst. The institution will form part of a group of public buildings, including the still unfinished baths and washhouses, which will shortly constitute the Pittfield-street frontage of the land occupied by the Shoreditch refuse destructor and electric lighting works. It includes lending and reference libraries, with shelving for about 28,000 volumes, a large news-room, together with magazine and boys' rooms. Mr. H. T. Hare is the architect of the new building. A description appeared in our issue of April 10, page 372.

HOTEL, FRASERBURGH, ABERDEEN.—An hotel is being erected at Fraserburgh, on the site of an old college. The frontage of the building, which extends for a length of 66 ft., will be granite throughout, partly dressed and partly rustic. The height from ground to eaves is 30 ft. The quaintly-carved inscriptions that adorned the old college are being preserved, and are to be built into the back wall of the hotel property. The names of the contractors are—Mason work, Mr. George Corbett, New Pittsigo; joiners, Messrs. Brebner & Jenkins, Fraserburgh; slater, Mr. S. Stephen, Fraserburgh; plasterer, Mr. Alexander Wiseman, Fraserburgh; plumber, Mr. W. Morrison Stewart, Fraserburgh; painter and glazier, Mr. James Stuart, Fraserburgh; Messrs. D. & J. R. McMillan, of Aberdeen, are the architects.

STORES, HETTON DOWNS, DURHAM.—The new butchery department and stables for the Hetton Downs Amicable and Industrial Society, Limited, have just been opened. The buildings are of Sherburn brick, roofed with blue slates. The front has a total length of about 90 ft., facing into Regent-street, while the back elevation is in Princess-street. The entrances are in Regent-

street. The stables are approached through the large gates in Regent-street, and are designed to house twelve horses, with harness-room, sick-box, and loose-boxes. The contractor is Mr. Robert Wade, of High Moorsley, and the clerk of works Mr. George Oates, of Leamside. The architects are Messrs. Barnes & Coates, of Sunderland and West Hartlepool.

PROPOSED ADDITION TO THE CITY HOSPITAL, ABERDEEN.—The City Hospital Committee of the Aberdeen Town Council met recently. The committee took into consideration the necessity for extending the present administrative block and providing more accommodation for the nurses and servants. Mr. Rust, City Architect, submitted plans showing additions to the present block, and providing twenty-one additional bedrooms, a nurses' sitting-room, a servants' dining-hall, an enlarged sewing-room, bathroom, and lavatory accommodation. The plans also showed discharge rooms on the ground floor. The committee, while recognising the necessity for increased accommodation for the staff, deferred further consideration of the plan till the next meeting. The cost is estimated at 4,000l.

PUBLIC BATHS, HAMPSHIRE.—An official inspection by the Chairman and members of the Baths and Washhouse Committee of the Hampshire Vestry has just been made of the new administrative block of the public baths in Finchley-road. The old front portion of the baths, which included administrative block, seven slipper baths, and the superintendent's apartments, was pulled down in consequence of the carrying out of the Manchester, Sheffield, and Lincolnshire Railway works. The company paid the Vestry 8,300l. as compensation, and gave them a larger quantity of ground for rebuilding upon, the new area being 5,056 square feet in place of 2,000 square feet. The new front is built in the English Renaissance style of an early type, from the designs of Messrs. Spalding & Cross, of Chislehurst, at a cost of 8,995l. The builder was Mr. T. Kingierie, of Oxford. The new buildings include an entrance-hall, with a central ticket-office, leading to two entrances for men and women respectively, twenty-four slipper baths (in place of seven old ones), with enamelled slate divisions, superintendent's and clerks' offices, board-room and waiting-room, and superintendent's apartments. The baths now include four swimming-baths and a number of upper-baths. The old portion of the baths has been repaired and redecorated throughout.

THE NEW POST-OFFICE, NEW OXFORD-STREET.—New premises for the Chief West Central District Post-office were opened on Sunday, the 17th instant. They stand at the junction with, and in, Hyde-street, and were erected from the designs of Mr. Tanner, of H.M.'s Office of Works, at a cost of 36,000l. upon a site purchased from the Duke of Bedford for, it is stated, 30,000l. The entire front is 208 ft. long, and 116 ft. deep. The western portion of the block (built of brick) contains two large rooms, 168 ft. by 58 ft., for sorting purposes, with recreation-rooms, kitchens, &c., for the staff, and class-rooms for the messengers' institute. We gather that the old office at the corner of South Molton-street, will be shortly pulled down, and that the site is to be taken for a block of residential flats, with quarters for Parr's Bank on the ground and basement floors.

CONSUMPITIVE HOSPITAL, PERTH.—New buildings are to be erected in connexion with the Hillside Home, Perth. They comprise a new hospital, a women's hospital, and an administrative block—all to be devoted exclusively to the treatment of consumptive patients. There are three blocks, the centre one being the administrative block, which contains kitchen, sculleries, store-room, larder, pantry, &c. There is also a parlour or office, and a large central hall, containing a stair leading up to the bedrooms for the nurses and servants. The two other blocks are the same in design, one being for women and the other for men. There are four rooms with two beds, and two with one bed each. In front of the rooms are verandahs on both floors. Between each block and the centre one there is a large corridor, used also as a conservatory and sitting-room for the patients. Behind these, and shut off by a close screen, are the two dining-rooms. The architect is Mr. Murray Robertson, Dundee.

REFORMATORY, KINGSWOOD, BRISTOL.—The last portion of the new buildings of this institution is now on the point of completion. The new building comprises a new schoolroom, carpenters' and blacksmiths' shops, band-room, and quarters for officers' dwellings. The architect for the building is Mr. H. C. M. Hirst, and the builder for the last portion of the work is Mr. J. A. Harris, of Bristol.

NEW LIBRARY, CEFN, GLAMORGAN.—The foundation stone has just been laid of this building. The plans of Mr. R. C. Jenkins, architect, Cefn, comprising billiard-rooms, reading-rooms, library, caretaker's offices, &c., were accepted, and the erection of the block in the High-street has been entrusted to Mr. James Lloyd Cefn.

ADDITIONS TO LAUNDRY.—WORCESTER AND MALVERN LAUNDRY COMPANY.—The company who have taken over this business are about to make considerable extensions to the laundry. In addition to remodelling the existing buildings a new carpet-beating warehouse, engine and boiler houses, stabling, &c., are about to be erected. The plans, which

have been approved by the Corporation, have been prepared by Mr. Geo. Dale Oliver, architect, Carlisle.

SANITARY AND ENGINEERING NEWS.

RESERVOIR, STAINES.—A large reservoir is about to be constructed at Staines. The enterprise is a joint one, and it is being made for the West Middlesex, Grand Junction, and the New River Companies, who are to contribute 1,000,000l. to build, and when finished will have a capacity of 3,300,000,000 gallons of water daily. Messrs. J. Aird are the contractors.

VAUXHALL TEMPORARY BRIDGE.—The middle span of the temporary bridge at Vauxhall was floated into position at high tide on Saturday last. PROPOSED NEW PIER, BLACKPOOL.—Some discussion took place at a meeting of the Blackpool Tradesmen's Association recently in reference to the proposal by a syndicate to seek Parliamentary powers for the erection of a fourth pier at Blackpool opposite the Palatine Hotel. Mr. T. S. Lund, the architect, attended, and explained that the pier would relieve the congested part of the promenade at that point by widening it to a distance of 82 ft. by 115 ft. in width. This meant an additional promenade space of 9,000 ft. A resolution against the pier was carried by a large majority.

ELECTRIC LIGHTING NEWS.

ELECTRIC LIGHTING, MANCHESTER.—At a meeting of the Manchester City Council on the 20th inst., Alderman Higginbottom introduced the recommendation of the Electricity Committee to make application to the Local Government Board for their sanction to the borrowing of the further sum of 150,000l. for the purpose of providing six new feeders to supply the old network. These would be necessary to convey the current from the new generators to the distributing mains. (2) Distributing mains in Chester-road and City-road. These mains it had already been determined by the Committee to lay forthwith. In addition to these, it would be desirable to connect up with Moss Side long Denmark-road and Moss-lane, and also along Preston-street. Borrowing powers would also be required for the erection of cable stores and a testing-room on the land at the Polygon, and for purchasing sites for transformer sub-stations in various parts of the city. The high-pressure feeders would be necessary for supplying some of these sub-stations and also for the high-pressure mains at Levenshulme. Provision was also made for carrying out the street lighting, which it had been decided to provide for winter. There had likewise been included a sum for new services and meters in the city area. In regard to Moss Side, the money was required for the distributing mains in the compulsory streets, and for high-pressure feeders. At Withington the money was required for sites for transformer sub-stations, for distributing mains in the compulsory streets, and for high-pressure feeders. The following was a summary of the estimated costs:—Manchester, 73,300l.; Moss Side, 15,600l.; Levenshulme, 8,970l.; Withington, 48,920l.; total, 146,790l. This would leave a sum of 3,210l. for sundries and contingencies." Mr. J. Phythian (Deputy-Chairman of the Electricity Committee) seconded the motion. Sir John Harwood suggested that the sum asked for should be 200,000l., and moved an amendment accordingly. This was seconded by Mr. W. Pollitt, and the Council agreed to it.

ELECTRIC LIGHTING, SWANSEA.—The electric lighting question was discussed at a special meeting of the Swansea Corporation recently. A report of the sub-committee was received, showing that they had failed to arrange with the British Traction Company to supply the latter with electricity for the trams at 14d. per unit up to 400,000 units, and 13d. per unit for any subsequent amount per annum. The sub-committee advised the immediate proceeding with the Corporation's own scheme, in combination with a dust destructor, as it was most necessary to have the traction in their own hands. Mr. Manville, the electrician, was then engaged, attended, and, after a long discussion, it was decided to proceed with the scheme, and to borrow 60,000l. for the purpose.

ELECTRIC LIGHTING FOR BARKING.—A Local Government Board inquiry has just been held at the Public Offices, Barking, by Mr. W. O. E. King, M.P. In answer to an application made by the Urban District Council of Barking for a loan of 15,000l. for purposes of electric lighting, and at the same time a further loan of 8,250l. was asked for to erect public baths. From the opening statement on behalf of the Council, it was shown that the town, although situated only eight miles from London, had been for years lighted by oil lamps, the Council

THE HOTEL CECIL.—The block of houses in front of the Hotel Cecil, in the Strand, is being cleared away preparatory to building the main front of the hotel. The façade will be set back so as to make the Strand at this point 70 ft. in width. The side streets now used as entrance-ways will be built over, and an archway entrance will be constructed in the centre, admitting to the quadrangle

A series of shops will occupy the ground floor of the frontage, the rest of the building being devoted to the hotel. The architects are Messrs. Perry and Reed.

PUBLIC IMPROVEMENTS IN CENTRAL LEEDS.—Several of the public and private projects now in hand for the improvement and development of the centre of Leeds have, says the *Yorkshire Post*, just reached an interesting stage. First of all, it is the scheme for the widening of Land's-lane. One large property was lately acquired by the Corporation, and notices have now been served upon the owners of all the scheduled premises on the east side of that thoroughfare, from nearly the top of Upperhead-row to Commercial-street. Between the west side of Land's-lane and Upperhead-row private enterprise is also exceedingly busy. An arcade is being erected, the architects being Messrs. Ambler & Bowman. The whole of the contracts have been let. The arcade, which will be named the "Victoria," will be 224 ft. long and 18 ft. wide. The widening of Land's-lane has revived to some extent a suggestion to make a good thoroughfare from Albion-place to Briggate, and thence direct on to the new street through the Shambles, already sanctioned by the Local Government Board. This proposal, should it eventually be carried out, would not only relieve the congested traffic in Commercial-street, but would also provide an alternative route to Vicar-lane and Kirkgate Market. Another matter which at the present time is engaging the attention of some of the municipal representatives, is the proposal to open out Central-road, lying between Duncan-street and Kirkgate. Not long since the owners of the Bull and Mouth Estate approached the Markets Committee, with the idea of forming a new street from Central-road, which is the property of the Corporation. The negotiations are still pending. Among other projected enterprises in Central Leeds are alterations in Lady-lane. In East Leeds the Corporation are making a short thoroughfare between Brass-street and Copper-street to communicate with Wrigglesworth-street.

APPOINTMENT OF DIOCESAN SURVEYOR.—Mr. S. Slingby Stallwood, F.S.A., of Reading, architect, has been appointed the Surveyor of Ecclesiastical Dilapidations for the Diocese of Oxford.

BRICKWORKS, TUNBRIDGE WELLS.—New brick-works have just been opened on the Forest Estate, Spread Eagle-road, Tunbridge Wells, by the Marquis of Abergavenny, on whose land they are situated.

METROPOLITAN ASYLUMS BOARD.—The members of the Metropolitan Asylums Board met at the County Hall, Spring-gardens, on Saturday last, under the presidency of Sir Edwin Galsworthy. A letter was read from the Local Government Board authorising the Managers to erect offices on the Victoria Embankment and to expend 40,000l. for that purpose.—Mr. J. Lobb moved, "That having regard to the fact that the total amount paid by the managers to architects and quantity surveyors during the last four years ended at Lady Day, 1897, was 63,683l. 9s. 7d., the question of the appointment of an architect to the Board be referred to the General Purposes Committee for consideration and report." After some discussion, the Managers voted upon the motion, the result being that the voting was equal—namely, 15 for and 15 against. The Chairman then gave his casting vote against the motion. It was accordingly lost. The Managers, after the transaction of some routine business, adjourned.

WARD'S STONE-LEADED STAIR-TREADS.—A prospectus and diagram of this form of stair-tread has been sent to us. The system consists apparently in drilling small circular holes, about 3 in. diameter, 1 in. in deep, and filling them with lead to the surface level of the step. We have not seen a specimen. We should expect such a step to give a good foothold until the lead began to wear below the surface of the stone, which it would certainly do unless the stone were a very soft one. As long as it lasts, however, it is no doubt a good and solid method of preserving a non-slipping surface. The patentees are Messrs. B. Ward & Co., of Westminster and Cardiff.

LABOUR MARKET IN THE COLONIES.—The April circular of the Emigrants' Information Office (31, Broadway, Westminster) states that in South Australia there is no demand for more hands, either in town or country districts. In Queensland the demand for labour is small, but the numerous railway and other works, which are now in progress, are helping to provide labourers with work. In Western Australia an Act has recently been passed prohibiting the landing of the following persons (amongst others):—"Any one who cannot himself write out, in the characters of any language of Europe, a passage in English of fifty words taken by the appointed officer from a British author, and append his name thereto in his own language"; or, "any one who is a pauper or likely to become a public charge." There continues to be a good demand for mechanics, miners, and other labourers. In Tasmania there is no demand for more mechanics or farm-labourers. Miners at Zeehan on the west coast, and in the surrounding districts, have been well employed; good miners can always get work, but there is no demand for inexperienced men. In New Zealand there has been plenty of work in nearly all parts for mechanics and country labourers; the local supply of mechanics seems to be sufficient, but experienced farm-labourers and miners will have little difficulty in finding places.

LEAKEARD CHURCH TOWER.—A special vestry was held at Leakeard on the 21st inst., to receive and consider the plans of the proposed new tower of the Parish Church, as amended to meet the views of the chancellor of the diocese (Rev. R. M. Paul), and to determine whether a fresh petition to the chancellor for a faculty should be sent.—Mr. J. Sansom, architect, produced the plans, which, he said, were precisely the same as the original design. The tower had been somewhat shortened, and instead of pinnacles there were battlements with corner turrets. He had reason to believe the plans would be accepted by the chancellor.—Mr. C. M. Olver moved that the original design be adhered to, but there was no seconder.—After some discussion, it was resolved, "That the report of the Committee for rebuilding the tower with the provision of a choir vestry, be adopted, and the vicar and churchwardens be authorised to apply to the diocesan authorities for the necessary faculty for taking down the remaining portions of the present tower and for the erection of a new tower according to the plans now before the vestry."—The new tower will be 80 ft. high, and will cost not less than £3,000.

SALE OF BOOKS.—The late Mr. E. Walford's topographical library and collection, with MSS. and autograph letters, was sold at Sotheby's on Tuesday, April 26. A set of the *Gentleman's Magazine*, 1731–1868, with some indexes, was bought for 100l., and a set of *Notes and Queries*, 1842–1868, for 20l. Another lot comprised nine large folio interleaved volumes of Thornbury and Walford's "Old and New London," and Walford's "Greater London" and "Environs of London," containing an immense amount of inserted old and new views, maps, newspaper cuttings, &c., &c., in which the *Builder* for both illustrations and text, is fully represented; this collection was purchased for 211. 10s.

DISTASTROUS FIRE IN GLASGOW.—An extensive and disastrous fire occurred in Glasgow on Monday evening about ten o'clock, and continued to burn until late Tuesday morning, causing the destruction of a large amount of property. The area involved is the square included within East Howard-street on the north, Ropework-lane on the east, Dunlop-street on the west, and Clyde-street, facing the river, on the south, and extends about 100 ft. broad by 200 ft. deep, though narrowing a little towards the south end. The flames caught the west side of Dunlop-street, and it was completely destroyed. The building in which the fire broke out was situated at the north-east corner of Howard-street and Dunlop-street. The damage has been estimated at over 150,000l.

CAPITAL AND LABOUR.

THE LEEDS BUILDING TRADE.—At a meeting of the Leeds Master Builders' Association, which was held on the 10th inst. in the Board-room of the Royal Exchange, Mr. W. Nicholson (President) in the chair, the Committee presented their report with reference to masons' notices, and a resolution was passed approving their action and the settlement. The agreement entered into with the masons' operatives in order to prevent strikes, namely, "That in case of any dispute arising between the masters and the operatives notice to be given by either side to the Association before any strike takes place, and a joint committee of five (three masons and two joiners) to mediate, and their decision to be final," was approved of, and considered to be just and likely to remove friction. On these terms the masters granted the advance asked for. In regard to the joiners' notices the same offer was made to them. In reference to the dispute at Hunslet Baths, information was received that the Town Clerk had examined the books of Messrs. Dearden Bros., against whom the operatives alleged breach of Corporation agreement in not paying the standard rate of wages in the city, and that he had found the operatives' allegation untrue. The Joint Committee of the Master Builders' Association and Builders' Exchange Club met in conference on the 22nd inst. at the Royal Exchange with the delegates of the carpenters and joiners to consider the application by the latter to have their wages advanced from 8½d. to 9d. per hour. The employers had previously offered to concede the advance sought provided the men would agree to alter the wording of rule 1, which now reads:—"That 8½d. per hour be the standard wage for carpenters and joiners of fair average ability," by the substitution of the words "standard wage for skilled workmen." The men have, however, refused this offer, and at the meeting on the 22nd inst. the masters made a further proposal, to the effect that the wage rule should remain as at present, substituting 9d. for 8½d. (and thus conceding the application of the men), but understanding that the Birmingham rule as to strikes and disputes be adopted as an honourable agreement. The Birmingham rule runs as follows:—"No strike shall be entered upon under any circumstances without the matter in dispute having been first brought before the Standing Committee, which shall, however, meet to discuss the matter within forty-eight hours of notice being given to the secretary; and the work in dispute shall remain in abeyance until such time as the Standing Committee

have settled the matter." It is suggested that the Standing Committee in Leeds shall consist of five or seven representatives from each side. The meeting was adjourned until Wednesday to give the men's delegates an opportunity of bringing the employers' proposals before their members.

NEWPORT (MON.) CARPENTERS' LOCK-OUT.—The Newport Conciliation Board met at the Town Hall, Newport, recently to endeavour to settle the dispute which has arisen between the master builders and the carpenters and joiners. The men's representatives attended, but the masters sent a letter, signed by their secretary, which was written evidently under a misapprehension as to the functions of the Board being in the direction of arbitration, and not conciliation. The lock-out has now lasted from the 7th inst.—It has since been stated that the carpenters have decided to form a new society, to be called the Newport Carpenters' Co-operative Society, which will undertake to do work, the society being conducted upon co-operative lines. About 150 carpenters and joiners are idle, and are in possession of the building trades are unable to go on with their work for lack of joiners.

STRIKE OF EDINBURGH JOINERS.—A meeting of Edinburgh and Leith joiners was held in the Albert Hall, Shandwick-place, Edinburgh, recently. Mr. William Gall, President of the men's society, in the chair. The secretary intimated that the Edinburgh Master Builders' Association had passed a resolution by the masters on the present rules and regulations with regard to the curtailment of overtime rates. The reply of the masters was to the effect that the communication from the men had been received. The meeting unanimously resolved that until the present regulations were signed by the masters for another year, the men should not start work. Work was accordingly suspended. The strike has since been settled, however, the masters having agreed to sign as desired by the men.

EDINBURGH MASONS.—A mass meeting of the Edinburgh and Leith masons was held in the Victoria Hall, Chambers-street, Edinburgh, recently. The meeting had under consideration the hours' question. It was moved that the masons return to a nine-hours' working day, as was the case prior to the strike last autumn, when an eight-hours' day was conceded by the employers. On a show of hands being taken for the motion, as against a direct negative, it was evident that the masons were rather close, and the chairman announced that a ballot would require to be taken. By 432 votes to 395, or a majority of 37, it was resolved to go back to the nine-hours' day. In regard to the wages question, it was eventually announced by the chairman that the meeting had resolved to retain the present rate of 94d. per hour, with cash for the balance of the day. On inquiry among the men, the opinion was freely expressed that the step taken at the meeting was a wise one, and that the remarkable wheel about was easily explained. It was simply that when the decision to reduce the working hours was arrived at, the "young bloods" in the trade succeeded in getting a majority of votes for a direct negative, and the masons, being the more sensible men have come forward and have asserted themselves. It was stated that they had held back on the previous occasion. A majority vote is decisive in this question, and it is expected that the party defeated may make another effort to assert their position.—*Edinburgh Evening Dispatch.*

THE WAGES QUESTION IN WINSFORD (BRISTOL).—At a joint meeting of the Operative Bricklayers' Society and a committee of the Saltmakers' Association had a conference recently aimed at the rate of bricklayers' wages in Winsford and district. At present the men are only paid 6½d. per hour. It was reported that all the masters except the Salt Union had offered to concede 8d. per hour. The Salt Union, who are the largest employers, insist on a sliding scale according to the state of trade. It was decided that, failing an increase before May 1st, the bricklayers under the Salt Union, and who are members of the Saltmakers' Association, should declare a strike.

CARPENTERS' AND JOINERS' WAGES, LINCOLN.—Some three months ago the carpenters and joiners of Lincoln gave notice to the master builders for an advance of one penny per hour and certain alterations in the working rules. After being in communication with the masters for some time without arriving at a settlement, a meeting between the masters and the workmen's committee was held at the Lincoln County Palace, when a settlement was arrived at, the masters agreeing to give, and the workmen accepting, an increase of one halfpenny per hour, making the standard rate of wages 8d. per hour. Slight concessions were made by both sides on the other rules in dispute, the amended rules to come into operation on May 1st.

LABOUR QUESTIONS IN THE BUILDING AND ALLIED TRADES, MANCHESTER.—It is stated that a settlement has now been arrived at with regard to the demands made by the local operative joiners upon the master builders of the Manchester district. At a general meeting of the Manchester and district joiners, held on the 21st inst. at the Central Hall, Oldham-street, Mr. J. Steward, chairman of the district, presiding, a report was given on the negotiations that had taken place between the committee and the master builders with regard to the alterations proposed by the men in the condi-

of working for the district, and the terms submitted by the Manchester Master Builders' Association for a settlement of the questions at issue, were brought up for consideration. The employers' proposals, which had been confirmed at a meeting of the master builders, held the previous evening, were discussed. The chief points on which concessions were offered had reference to increased rates for the first two hours' overtime, increased "lodging" allowance for country jobs, and better allowances for time occupied by workers travelling to and from the works. The meeting decided to accept the offers made by the employers for a settlement of the movement.

THE CARPENTERS' STRIKE IN LEICESTER.—Mr. R. Askwith, barrister, London, the arbitrator appointed by the Board of Trade in the local building trade dispute, has brought the differences between masters and men to a satisfactory conclusion, with the result that the men have resumed work. The men's proposals were, briefly, a reduction of hours, and an increase of 4d. per hour, while the counter proposals of the federated employers were that the workmen should continue at 8d. an hour, and that the hours of work should be reduced during the months from 48 to 45½. The following award has been accepted by both parties:—Between the Leicester Master Builders' Association and the Leicester branches of the Amalgamated Society of Carpenters and Joiners. . . . I award and declare that Rule 1 of the working rules binding the employers of carpenters and joiners and the operative carpenters and joiners in Leicester district published in the year 1905, shall read as follows:—"The standard rate of wages of efficient workmen shall be ninepence per hour." That Rule 2 shall read as follows:—"The hours of work shall be from the 1st day of March to October 31 (both days inclusive), for the first five 5 a.m. to 5 p.m., with half an hour for breakfast and half an hour for dinner; from November 1st to December 31, from 7 a.m. to 12 a.m., with half an hour for breakfast. During the first two weeks of November and the last two weeks of February, from 7.30 a.m. to 5 p.m., and during the remaining part of November, the last two weeks of December, the last two weeks of January, and the first two weeks of February, from 7.30 a.m. to 4 p.m., with one hour for dinner; on Saturdays from 7.30 a.m. to 12 a.m. A look-up shed shall be erected on the job for the accommodation of outdoor workmen for their tools; hot water shall be provided for meals for outdoor carpenters and joiners, and for breakfast for workmen engaged in shops. The employers shall use their best endeavours to provide arrangements for meal-times, in order that workmen may have their meals either in the shop, on the job, or in a convenient place set apart for the purpose, and to provide a person to supply hot water and do the cooking for breakfast."

That Rule 3 shall read as follows:—"Increase payment for overtime to commence half an hour after leaving-off time from March 1 to October 31, and during the rest of the year at leaving-off time as per time to stated time of starting at the rate of time per quarter, and on Saturdays to commence at 4 p.m., and be at the rate of time and a half; double time on Sundays and Christmas Day. Overtime shall not be payable unless absolutely necessary. This award shall be substituted for 'one o'clock,' and 'one o'clock' for '1.30.' Rule 5, Clause 1, shall read: 'If the works are situated within the boundaries of the municipal borough the men to be at their work at the usual time for commencing.' In Clause 2, 'twelve' shall be substituted for 'one o'clock' in both cases. Clause 3 shall remain without alteration. Clause 4, after 'Saturdays,' insert the words, 'at which time payment for overtime commences.' Clause 6 shall read as follows: 'One hour's notice shall be given or required of any intention to put an end to the service, and in default thereof either party shall forfeit or pay to the other the one hour's wages, such time to be applied to the tools or in continuance of work. Any workman discharged when working away from the shop to be entitled to walk to the shop in the employer's time, less there is convenience on the job for grinding, by train, third class fare or walking time at three p.m. to 4 p.m. Rule 8, Clause 1, after the words, 'Month of November,' there shall be inserted the words, 'and any counter-proposals all submitted before the 7th of the following December.' In Rule 8, after Clause 3, there shall be inserted the following as Clause 4, viz.: 'That without notice to the rights of any employer under Rule 7 of the award, no person shall be sent in cases of violation of the rules of the committee of the governing parties, and if not remedied within fourteen days of receipt of sanction by their party shall take such action as may be deemed necessary, but if the violation is disputed the committee so notified shall, in reply, state within seven days the ground of their objection, and then, if required, by further notice given within thirty days for the delivery of the statement, bring the dispute before the council constituted as above, with a mediator, who shall meet within fourteen days to settle the dispute, and until point or points in dispute have been discussed by the council, and in case of their failure to settle the dispute until after the expiration of fourteen days, the matter shall go to the council at which the matter was considered, no action shall be taken

by either side, and I further award and determine that if any difference shall arise as to the construction to be put upon this award or as to the manner in which the same shall be obeyed or carried out, such differences may, at the request of either of the parties hereto or their representatives, duly authorised, be submitted to me for my determination. . . . Signed and published in the presence of George Hardington (President of the Leicester Master Builders' Association), John Cragg (President Carpenters and Joiners' Society).

STRIKE OF PAISLEY JOINERS.—On the 20th inst. the joiners employed at the erection of the new school in Carbrook-street, Paisley, were called out by their society. It appears that the men have been in the habit of starting at 6.30 a.m. and working till 5 p.m., with short meal hours, and the society now want them to start at 6 a.m. and have full meal hours. The masters state that they are infringing the by-laws as to hours of working, but the society hold that they are.

THE BUILDING TRADE, WEST LOOE, CORNWALL.—At a meeting of mechanics, carpenters, masons, and other workmen held at West Looe it was decided to serve written notices on master builders asking for 6d. per hour instead of 5½d. per hour, and cessation of work at one o'clock on Saturdays instead of four o'clock.

LEGAL.

DISPUTE BETWEEN A BIRMINGHAM BUILDER AND THE CORPORATION.

THE case of *Blundell v. Price* came before a Divisional Court of Queen's Bench, consisting of Mr. Justice Wills and Mr. Justice Kennedy, on the 25th inst., for argument on appeal from the Birmingham Justices.

Mr. Lawson Walton, Q.C., in support of the appeal, said it came before the Court by way of a special case from the decision of the Justices, and raised the question whether the system of drainage which was organised by the appellant in regard to some new buildings which he was building was or was not adequately ventilated in accordance with the by-laws of the Corporation of Birmingham. The appellant said it was, and the Justices said it was not. The question really turned upon the word "sewer" in its application to the by-laws. The case stated that the appellant was charged upon an information of the Corporation that on October 18, 1897, at Charles-road, he did unlawfully break by-law No. 61, by neglecting to provide for a main drain for certain new buildings then being erected on the west side of Charles-road, a suitable trap of ventilation as provided by the by-law in question. The contention of the appellant was that the whole of the sewage pipes belonging to his six houses formed, strictly speaking, a drain, that was, although they connected and communicated with the main drain or passage, yet all the pipes retained their character of drains, as distinct from a sewer. Mr. Justice Wills said that the appellant wanted to make one ventilating trap do for each three houses, and the Corporation wanted a trap to each house.

Mr. Walton replied that that was exactly the point. The Corporation said that at each pipe shortly after it left each house there ought to be a separate trap, and there ought to be six instead of two, which appellant proposed to make.

The appeal was ultimately dismissed with costs.

MEETINGS.

FRIDAY, APRIL 29.

Architectural Association.—Members' Soirée (Smoking Concert), Café Monico, Piccadilly-circus. 8 p.m.
Institution of Mechanical Engineers.—Ordinary General Meeting (concluded). Mr. S. Tebbutt on "Steam Laundry Machinery." 7.30 p.m.

SATURDAY, APRIL 30.

Incorporated Association of Municipal and County Engineers.—Home Counties' District meeting at Wimborne.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Outfall Works, Barking.

MONDAY, MAY 2.

Royal Institute of British Architects.—(1) Special General Meeting to confirm the resolutions concerning the clause to be added to By-law 9, and the alterations in By-laws 30 and 31, passed at the Special General Meeting of April 18. (2) Annual General Meeting.—(a) To approve a recommendation of the Council to admit to alliance with the Royal Institute, the Aberdeen Society of Architects. (b) To receive and consider the annual report. (c) To elect scrutineers for the annual election of the Council and Standing Committees. (d) To nominate candidates as auditors for the ensuing year of office. (e) To appoint, under By-law 43, the Statutory Board of Examiners under the London Building Act 1894, and other Acts of Parliament, for the ensuing year of office. 8 p.m.
Surveyors' Institution.—(1) Adjourned discussion on Mr. H. M. Grollier's paper, entitled "Title Rent Charge Recovery." (2) (a, should time permit), discussion on Mr. Thomas Blashill's paper, read at the Manchester meeting, entitled "Lessons from Fire and Panic." 8 p.m.
Society of Engineers.—The adjourned discussion will be concluded on the paper entitled, "The Protection of Underground Water Supplies," read by Mr. John C. Thresh, M.D. 7.30 p.m.

Society of Arts (Cantor Lectures).—Professor Carus Wilson on "The Electric Locomotive." I. 8 p.m.

TUESDAY, MAY 3.

Society of Arts (Applied Art Section).—Mr. Joseph Pennell on "Senefelder and the Centenary of Lithography, 1798-1898." 8 p.m.

WEDNESDAY, MAY 4.

Royal Archaeological Institute.—Professor W. Boyd Dawkins on "The Excavations made in Hod Camp, near Blandford, in 1897." 4 p.m.

British Archaeological Association.—Annual meeting to be held at 35, Sackville-street, Piccadilly. 4.20 p.m.

Society of Arts.—Miss Olive Bayley on "The Revival of Hand-loom Weaving." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

Edinburgh Architectural Association.—Annual Business Meeting and President's Valedictory Address. 8 p.m.

Edinburgh Architectural Society.—Mr. A. N. Paterson, M.A., on "Evolution of the House: the Modern Product, including some Principles of House Planning and Design." 8 p.m.

THURSDAY, MAY 5.

Society of Antiquaries.—8.30 p.m.
Society for the Encouragement of the Fine Arts (at the Galleries of the Royal Society of British Artists, Suffolk-street, Pall Mall).—Sir Wyke Baylis, F.R.S., on "The Likeness of Christ, from the First to the Nineteenth Century." 8 p.m.

FRIDAY, MAY 6.

Architectural Association.—(1) Mr. W. Eckstein, C.E., on "Interior Lighting (Reflected Lights, &c.)." (2) Mr. Tom Ekin on "Electric Lighting as Applied to Architecture." 7.30 p.m.

Institution of Junior Engineers.—Westminster Palace Hotel.—Mr. H. Fraser on "Evaporative Condensers and Independent Air-Pumps for same." 8 p.m.

SATURDAY, MAY 7.

British Institute of Certified Carpenters (Carpenters' Hall).—Mr. T. M. G. Lloyd on "Some East Anglian Churches." 6 p.m.

Edinburgh Architectural Association.—Visit to (1) Craigiehall; (2) Camo.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until June 6.

1699.7, 687.—CONSTRUCTION OF WALLS, PARTITIONS, AND OTHER STRUCTURES: J. Sheppard and F. Dashwood.—The bricks or tiles have moulded channels on their sides and ends, with dovetailed divisions (between the channels). Mortar is laid on the bed and ends of the brick or tile, and also on the side channels, forming dovetails and keys of mortar in beds and joints respectively. For setting bricks in backs, for drying, the inventors use pallets, formed with pierced corrugated work and strips of wood, metal, or other material on their upper edges, so that the pallets carry the whole weight of the courses in the backs, and each brick or tile is held in a separate cell, freely from vertical pressure.

8,817.—DOOR AND GATE FASTENINGS: G. Baldry.—For fastenings which embody a sliding bolt, operating in keepers. The bolt, which is square, is fitted to an ordinary plate, and has a number of teeth; it is worked by a ratchet lever, fixed with a pin on one of the slides which guide the bolt.

10,064.—A SOLDERING-IRON: T. M. Cox-Walker and C. F. Cowdon.—The object of the invention is to supply an iron that can be continuously heated whilst in use: the bellows or blower is connected to a vessel containing benzoline or other suitable hydrocarbons, a pipe passing out of the vessel receives a tube to which is attached a pipe to form a handle for carrying the iron; the latter consists of a hollow platinum cylinder or point attached to the pipe or handle, over the platinum point is a metal protecting thimble or shield and over the protector is a hollow soldering bit attached to the tube or pipe. In operation a mixture of air and benzoline or other hydrocarbon vapour is forced through the tubes and pipes into the heated platinum point, the soldering bit is then replaced or refixed, and quickly becomes hot, and may be so kept continuously by working the bellows or blower.

12,235.—WINDOW FRAMES: R. Viewers.—A second frame or glass stile is hinged inside an ordinary frame; thus the glass or window, being carried inside the ordinary frame, may be opened or closed as a casement window, when closed can slide up and down; the top and bottom frames have flanges or beadings which, by overlapping, prevent draughts and the insertion of knives, &c., from without.

13,187.—SAFEST FASTENERS: J. Law and J. A. Crane.—A bolt, of crank shape, is secured by a swivel action to a plate in the lower sash; the overhanging part of the bolt has a pointed nose-bit formed at right angles which engages into notches in the frame; the knob has a swivel action, and carries a tab, below the bolt's level, fitting into a slot in the plate by side-pressure; the parts are made reversible by withdrawing the swivel screws, when two fasteners are required on the same window.

13,411.—VENETIAN BLINDS: Mary Proctor.—Instead of being nailed at the top, the tapes are hooked or buttoned on to the top rail of the blind; the hooks may be formed by fastening plates to the top rail, and making spring tongues in the plates.

13,558.—PLUG-TAPS: H. Smith.—The invention consists in making a screw joint in the tap's plug end, combined with the insertion, in the tube of a plug behind the joint, of a strainer which may be easily removed.

14,735.—DOOR AND WINDOW CLOSING APPARATUS: A. H. Telford and D. Richardson.—The doors are pivoted at the sides upon pintles of which one, on each door, projects through the frame above the door; on the extended pintles cranks are extended at about a right angle to the plane of the doors and are connected by a rod, to which springs are attached; when either door is opened in one direction the cranks and rod open the other door in the contrary direction, but when pressure is brought to bear upon both doors, and on the same side, the tendency of the pressure to open one door is nullified by the pressure upon the other door.

14,958.—VICE: E. Kain.—To ensure an instantaneous grip, a box, fixed upon the back jaw of the vice, has a hole for receiving a nut of the main screw carrying projections which engage with strips in the box; at the end of the main screw is a washer, or collar, having raised projections

CONTRACTS—Continued.

[illegible]

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*Architectural Assistant	Loughboro' Corp.	2. 2s. per week	No date

[illegible]

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This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some minor creases and discoloration, characteristic of old paper. The right edge of the page shows the binding, which is a dark red or maroon color. There is no text or other markings on the page.

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ILLUSTRATIONS.

New Town Hall and Law Courts, Cardiff.—Messrs. Lancaster, Stewart, & Richards, Architects	Extra Large Page Photo-Litho.
Art Gallery and Library, Bath.—Mr. J. M. Brydon, F.R.I.B.A., Architect	Double-Page Photo-Litho.
Dining Room, Stowell Park.—Mr. John Belcher, F.R.I.B.A., Architect	Double-Page Ink-Photo
Abbey Mansions, Victoria-street, Westminster.—Mr. C. J. C. Pawley, Architect	Single-Page Ink-Photo
Army and Navy Mansions, Victoria-street, Westminster.—Mr. C. J. C. Pawley, Architect	Single-Page Ink-Photo

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Architecture at the Paris Salons.

THE two Salons, the Old and the New, are now united in the great glass-covered building erected as the "Galerie des Machines" of the 1889 exhibition; the Old Salon occupying the eastern, the New Salon the western half of the building. The entrance for both is at the eastern end, in the Avenue Labourdonnais, the same entrance fee admitting to both salons, which is an advantage as far as the public are concerned, besides the saving of trouble from having both the exhibitions under one roof. The paintings and drawings are hung in galleries running round the outside of the immense space enclosed by the building, the sculpture being placed in the central area. The portion occupied by the New Salon is, however, by far the best and most effective in arrangement; the pictures hanging are less in number and confined to the upper part of the walls, the upper portion of which is decorated throughout by a large tapestry frieze, while in the Old Salon portion the pictures, as before, are hanging nearly up to the roof of the galleries. The sculpture court, too, the arrangement of the New Salon is much more effective. At a part of the area a great architectural arcade has been built up, of columns and an entablature, intercepted by openings at the four cardinal points, and the sculpture is arranged within and around this erection. In the Old Salon portion the sculpture is merely placed about where it comes most conveniently, without any special regard to effect, except that the largest works are placed on the centre line. The managers of the New Salon have always better understood the art of effective arrangement of their exhibition, and the same characteristic is kept up in the new site.

As before, the great preponderance of architectural drawings are to be found in the Old Salon, and these are arranged in the low level which runs along the north side of the building. On the whole, the collection is of less interest than usual, as we do not find any one great series of drawings illustrating restoration of some antique building on an immense scale, such as has usually been

a feature in previous exhibitions; and there is even less than usual of the illustration of contemporary architecture; nearly all the finest drawings consisting either of restorations, competition designs, or drawings of old work; in fact, it is the exception to come across any drawings of buildings in progress or intended for execution. In this respect the Salon continues to show the same marked contrast to our small exhibition in the architectural room at Burlington House, where the majority of the drawings represent the actual work of the day. That this is a great defect in the architectural department of the Salon has been long recognised in Paris, though year after year there seems to be no definite effort made to reform it.

The first thing which catches the eye, however, is a very large model of a portion of an apartment house in Paris—"Immeuble à rapport," by M. Rives. The model, which is backed against the wall of the gallery, shows a projecting bay running through several stories, the ground story a semi-octagon on plan, while the upper portion, by a very bold system of corbelling out, assumes the plan of a semi-circle projecting beyond the octagon base. A very fine elevation drawing of the whole front is added, together with decorative details to a large scale, shown in the splendid tinted and shadowed drawings in the production of which the French architects expend so much skill and pains. The architecture, with the exception of the change from semi-octagon to semi-circle above noted, shows nothing different from the usual detail of a Parisian street front of the superior class. The next thing we notice is an immense drawing of an "Eglise de Pèlerinage" by M. Joseph Bernard, not however a religious shrine in the usual sense, but a temple for the apotheosis of eminent architects, for we read on the panels of the piers, flanking the great flight of steps up to the church, the names "St. Garnier, St. Gisors, St. Vaudremer, St. Nenot" &c. French architects have the merit of having "a good conceit of themselves" and of their art. A scheme such as this would be regarded as a joke in London, but we do not suppose it is by any means so regarded in Paris; on the contrary it would pass as a very natural idea; and though we do not suppose there is the slightest possibility of it being carried out, one cannot but admire the feeling which prompts it.

The competitions for the intended buildings for the 1900 Exhibition have left their mark on the show. M. Joanny Bernard exhibits a great set of elevations for the building for the "Armées de terre et de mer," and there are one or two others in the exhibition. The same architect also exhibits competition drawings for the new Hôtel de Ville for Versailles. The curious thing is (and it shows how strong is Academic influence in French architectural design) that there is so little difference in general style and character between these two designs for such different objects; except in regard to scale, either one of them would serve either title; both are admirable in their way, but both seem to follow the same accepted programme in the application of classic materials to modern buildings. M. Tronchet's "Projet d'école supérieure de la Marine" is again in much the same style, only the central feature is a dome with an exterior staircase over the outside of it; what special function this is to serve in an "École de la Marine" we do not gather.

In M. Legros' great series of drawings of the "Hôpital Boucicaut" we at last come on the illustration of an actual modern work of considerable importance; a complete series of drawings, accompanied by photographs from portions of the building, exterior and interior. The plan is arranged on a most symmetrical system. The "Administration" occupies one long block forming the front façade to the road. Behind this four lines of ward blocks extend at right angles to the front block, arranged in parallel couples on each side of the site, with a central garden between. The two left hand blocks belong to the surgical, the two right hand ones to the medical department. The outer block on each side is for non-contagious cases, the inner one next the garden for contagious cases. The upper half of all four blocks, dividing them across the centre, is for women, the lower half, nearest the administration building, for men. The architectural design, for our English ideas, is somewhat too pretentious for a hospital. The interior photographs of the wards look very spacious and airy; they are formed with a barrel-vaulted ceiling with the window spaces cutting into it as "Welsh vaults." The whole set of drawings is a very fine and complete exposition of the construction of the building.

M. Pietch's "Projet de Four Crématoire"

is another architectural dream of what might be. The bird's eye view shows a colonnaded Campo Santo in the rear of a great block of building with a circular hall in the centre portion. There is some novelty in the application of materials derived from Classic work to this class of building, and the design, of which of course complete plans are shown, is perfectly suitable to its purpose, only on a scale which is never likely to be realised. Next comes a splendid set of drawings for the restoration of and additions to the Cathedral of Rodez, by M. Jean Pailhès. This is a church of the Flamboyant period of which the original west front has been partially destroyed or never completed, and has been finished with Renaissance cupolas and other additions; these it is proposed to remove, and to make a modern Gothic termination with a large central traceried gable; other less important alterations are shown to other portions of the building. The drawings are a splendid set; the immense perspective view of the whole is sliding down to every separate stone. The contemplation of such a drawing is enough to fill the mind of the English architectural draughtsman with mingled feelings of ambition and despair. But we may console ourselves by reflecting that drawings are not everything in architecture.

Among the restorations are one or two of antique subjects shown in very fine drawings, though not the colossal displays which we have been accustomed to see almost every year at the Salon. One of these is M. Emile André's view and restoration of the Temple of Kom Ombos. The restoration elevations are a fine and elaborate set of coloured drawings, but perhaps the best value of the exhibit resides really in the very fine views of the actual state of the remains. M. Parmentier exhibits drawings of the restoration of the late Roman temple of Saturn at Dougga in Tunisia (A.D. 195). The restoration shows a long cross gallery in front, what would be a "narthex" in an early church, with an open colonnade in the centre portion of the front wall; behind this is a great square court with a colonnade on a smaller scale round it, and in the rear of this a block of building, showing three large wall arches, indicating a vaulted interior, and crowned by the normal Roman balustrade with its cross-bars in X shape in each panel. For all this scheme the careful delineation of the "état actuel" furnishes indeed a slender enough basis, the only portion for which there seems to be really evidence being the treatment of the front wall: but the drawings show at all events a fine Classic imagination on the part of their author. Among the Mediæval restoration drawings are a set by M. G. J. A. Lisch of the Château de Valmont, a curious monument showing a wing of Francis I. style added, like a long stalk, to a jumble of machicolated buildings of earlier date, and previously partly restored or repaired in the upper portion with brickwork; as usual in these cases, the drawings of the building as existing show the whole detail, colour, and texture of the ancient stonework with the greatest minuteness. It may be said that this is waste of time; on the other hand it shows a most exemplary conscientiousness of workmanship. It may be that it is because the French restoring

architects make such a clean sweep of the ancient aspect of a building, when they once begin, that they feel bound at all events to leave the most accurate possible record of its appearance before they laid their hands on it. In this case the Francis I. wing is not apparently to be touched, but it is proposed to restore the Mediæval fortified portion as it might, would, or should have been when first erected. The owner would have been wiser to have let it alone. Another Mediæval restoration illustrated is that of the old church of Ferté-sous-Jouarre (Seine-et-Marne), by M. Dobiecki, who proposes to add a new western façade with cast-iron Gothic details; and indeed one may say of modern French Gothic detail what Artemus Ward said of the Red Indian—"It is poison wherever met with;" it seems extraordinary that the architects of a country full of the finest Mediæval monuments in existence should so totally fail to grasp the spirit of the ancient work. It is probably the result of their extremely academical education, all based on classic work, and a neglect of the study of Gothic from actual examples, until the architect who has successfully passed the "Ecole" programme finds himself with the appointment of a Diocesan architect, and the chance of making sport of the old churches of the district.

Among the comparatively few drawings of work in hand or to be carried out is a small church for Saint Rémy (Bordeaux), by M. Le Rille, a quasi-Byzantine design with an exterior timber roof, but showing small masonry domes internally. An important new work is M. Monestel's Savings Bank for Toulon. This is shown in a very fine set of drawings, and is distinguished by simplicity and massiveness of character; the basement story appears to be of granite, above which is an expanse of white masonry (?) walling with rusticated windows of very bold detail introduced; at the top is a deep frieze of coloured terra-cotta ornament, of which a large-scale detail is shown. This kind of building is just one of the things that French architects do best, and both design and drawing here merit high praise. M. Fontaine exhibits drawings of the "Orphelinat Audiffert," at Troyes, a building well arranged on plan, and appearing in the perspective drawing as one of those cold and formal blocks of stone with occasional panels of red brick, which seem to be the recognised French architectural expression for every kind of official building, either for educational or hygienic purposes—schools, asylums, reformatories, &c. A more dreary style of building could not be imagined, or one more opposed to the semi-domestic expression which, one would think, ought to characterise buildings of this class. M. Margotin exhibits drawings of a private residence at Reims, apparently intended as a shooting-box, from the decoration of the salle-à-manger (of which an interior perspective is given) with mural paintings of sporting subjects and stained glass windows of similar suggestion. The exterior architecture of the house is dignified though very conventional; of the details of woodwork in the salle-à-manger the less said the better. This is a satisfactory house, however, compared with M. Denis's villa at Tréport, one of those half-timber country houses all cranks and elbows and gimcracks, and which suggest a cracker going off. What is the mysterious influence which induces a

nation who in the higher domains of art are full of culture and intellectual perception to like this kind of architectural barbarity in their country houses, it is impossible to understand. In the buildings for town streets, the designs, if conventional, generally show at least architectural restraint and dignity, as we see in this exhibit in M. Champeaux' design for a "Maison à Rapport," and M. Seillier's design for the rebuilding of the "Salon des Familles" on the Avenue Saint-Mandé; a good façade rather "busy" modern classic type, with some effective sculpture in the central fronton. The recent competition for Hôtel for the "New York" Company has produced some good designs which are among the exhibits; the best being that by M. Maistrasse, a pupil of M. Guadet. Among other "projects" is a good one, rather ambitious, for a Central Hall for a Bath establishment, by M. Bouvier; and one for a Circus building by M. Cornille, which has the merit of raising this class of building into the region of architecture.

Among the decorative designs is one by M. Perrier for a monument to Gaspard André the architect. Within one of the arches of an arcade two square columns are placed, carrying an entablature, and in the open space between the upper part of the column is placed the bust of André, carried on a pedestal filling up the space between the lower portion of the columns. As a monument to an architect it is very suitable and pleasing. A monument "à la gloire de la République Française," by M. Arnaud, looks as if it belonged to fifty years ago. A design for mosaic decoration for the church of Fourvières, by M. Lameire, is a spirited and unusual piece of work; it represents the sea-fight of Lepanto, galleys and water being very well treated in a conventional and decorative fashion. A series of highly-finished small drawings for the decoration of a smoking-room in Oriental style, by M. Wable, are worth notice, though the colouring is rather crude and strong; also a long series of cartoons by M. Hippolyte Berteaux, studies for panel decorations for the Salle des Gardes at Chenonceau; these are small-scale studies of nude figures in monochrome, mostly playing an instrument, each figure occupying one panel, with gilt borders between the figures show a great deal of spirit and variety.

The illustrations of ancient work are usual numerous, and some of them very good. M. Munier exhibits coloured geometrical drawings of the Harem of the Palace of Amenophis IV., including a large and careful drawing of the brickwork floor with its two mosaic representations of ponds with water and fish. Among the finest and most interesting of the illustrative drawings are the three water-colours by M. Viatte of three splendid Renaissance chimney-pieces from the Château de Cadillac-sur-Garonne, two of them profusely adorned with very boldly-designed marble sculpture; the third that of the chamber of the Duc d'Épernon more delicately designed, with no sculpture figures, but a great deal of very delicate and refined carving, shown with the greatest finish of execution in the drawing. M. Guédy exhibits water-colour drawings of the very curious "Danse Macabre" from the Abbey of Saint Robert (Haute-Loire). With this may be grouped the drawings of M. Chape-

in de Caubeyres of the twelfth century mural paintings in the Chapel of Notre Dame the Priory of Yron-en-Dunois at Cloyes, which has been long used as a granary. The paintings, which are much defaced, are carefully shown in their existing state, with no attempt at restoration; they include the subjects, on the walls, of the adoration of the Magi and the betrayal of Christ. The apse had been twice painted with the same subject, Christ in glory, the remains of the first painting being found under those of the later one; the drawing shows a design of considerable decorative effect, the figure of Christ having for a background a series of interlacing circles containing symbols of the evangelists, and other designs. Among smaller works, sketches, we may notice the frame of pencil sketches by M. Schbaecher; a larger series of pencil sketches, very cleanly executed, of churches and other buildings in Burgundy and Champagne, by M. Grellet, and a set of small watercolours by M. Périn of "Manoirs Normands," drawings of old Normandy farmhouses of great variety of style and exceedingly interesting and picturesque. Besides these, we noticed M. Lafargue's measured and coloured drawing of the Hotel Alluye, Blois; M. Yperman's very careful drawings of mosaics at San Vitale; M. Bénard's water-colour sketches at Versailles, specially the "Fontaine des Homards," where the effect of the coloured marbles and gilded decoration is admirably shown; and M. Denby's fine and elaborately finished exterior view of San Miniato. Among the architectural exhibits are several by English architects: a design for wrought-iron gates by Mr. Pawley; the exterior perspective of the Cardiff Synagogue, by Mr. Delissa Joseph, and "Kincardine, Deeside," by Messrs. Niven & Wigglesworth; all of which have been illustrated in our pages.*

In the new Salon architecture is only represented in a partial and accidental manner by a few stray drawings, some of them of the most fantastic description. M. Garas, for instance, shows two immense cartoons for a temple in honour of Wagner, which is simply an indescribable nightmare; and M. Provensal exhibits an almost equally *outré* perspective drawing of a château, represented as dead white against a nearly black sky. The few drawings of a more serious kind are not of sufficient importance for notice, and in fact the section of "architecture" in the catalogue is re-inforced by including under it items of furniture and other things which should more properly have been classed under "Objets d'Art." The New Salon alone includes furniture and other crafts in its programme, for though the Old Salon includes a section of "Art Décoratif" in its catalogue, the objects thus classified are chiefly miniature sculpture and bijoux; the New Salon alone admits objects of use treated decoratively. The contemplation of these, however, is not very satisfactory to the English eye. There is, in every sense of the words, a kind of "bad taste" about them. There are, for instance, several cases of book-bindings, but scarcely anything that would be tolerated in an Arts and Crafts Exhibition in London; strongly

coloured floral designs on a crude white ground are among the things exhibited; and in fact none of the bindings are tolerable except some wooden boards with flat incised and partly coloured designs on them, exhibited by Mr. Sandford Pomeroy, who we observe is an American, though now domiciled in Paris. It is the same with most of the furniture; the furnished room exhibited by M. Plumet ("moblier de Salon") shows some good simple upholstery, but the woodwork of chairs, table, and bookcase is of a weak and bad style, full of unnecessary cranks and angles, and modelled in a way which suggests that it is in a fusible material from which the form has been partially melted away; apparently the idea of woodwork finish is to sandpaper all decisive shape and sharpness out of it. A "Bibliothèque" or book-stand in three stages, by M. Polignac, is an exception, though this perhaps is rather too architecturally treated for furniture. There is a little good pewter work (not equal to what we have seen on former occasions); there are some pretty fancies in M. Nocq's case of jewellery and other small articles; M. L. C. Tiffany (a native of New York) exhibits a case of very fine lustre ware, and a large kind of sideboard covered with small diapers of marble mosaic and with an effective piece of stained glass as a panel in the back. The best thing in this class of work exhibited by any native-born French artist is M. Aubert's mural decoration for a bath-room, with a frieze of girls bathing along the top, in buff-coloured stoneware, the remainder of the wall space being a conventional representation of water, in which their figures cast reflections; this is very cleverly carried out, and in a truly decorative spirit, but it is a very exceptional example. The fault of nearly all the French decorative art-work is that fatal craze for cleverness, for doing something ingenious, surprising, and unexpected, and the consequent neglect of simplicity and balance of line and of constructive design. In sculpture and painting we have much to learn from the French; in decorative craft there is much they might learn from us, if they could only be persuaded of the fact.

NOTES.

Restoration of the Parthenon. We learn from the *Berliner Philologische Wochenschrift*, April 23, that the long-projected repairs of the Parthenon are now at last actually begun. Huge blocks of marble are being prepared in the quarries of Pentelicus to replace certain damaged blocks in the temple. The direction of the work is in the hands of a Greek engineer, Mr. Balanos. The cost is to be borne by the Greek Archaeological Society, which has also undertaken the repair of other ancient buildings, beginning with the Monument of Philopappos. This work of conservation is certainly not second in importance to that of excavation; it has been too long neglected.

Abbey Dore. We have received a pamphlet containing a short account of Abbey Dore, its history and its present condition, written by Mr. R. W. Paul, whose name has been specially associated with the building recently in consequence of the explorations he has made there, and the plans of portions of the old

work which he has recovered. The main object of the pamphlet is to furnish a basis for an appeal for funds for necessary repairs, which are to be carried out under Mr. Paul's superintendence. It will be remembered that the eastern portion of the building is in occupation as a church, although the nave is in ruins. After the building had been nearly ruined at the Dissolution, it passed into the hands of the Scudamore family, and after remaining in a ruined state for nearly a century, the Lord Scudamore of the day restored and reopened the eastern arm of the church for service in 1634. He re-roofed it, walled up the western arches of the crossing, and erected a tower, and this portion of the building passed into use as a church. Nothing has been done to the building since, and the three things specially wanted now are proper external drainage, a sound ceiling, and a dry floor. It is proposed to take up the pavement, cover the area with concrete, and replace the old inscribed stones in their original positions. The ceiling will be repaired and made safe, and some defects in the woodwork made good, the present rough seats and flooring in the presbytery will be removed, and a wood block floor laid down provided with chairs and suitable choir seats and prayer desk. The fittings placed in the church by Lord Scudamore will be retained, and nothing is spoken of in the way of "restoration," only the repair necessary to put the portion used as a church into a decent and safe condition.*

Agecroft Cemetery Competition. In our issue of the 23rd ult. we commented on the instructions to architects in this competition, which is promoted by the Corporation of Salford. The conditions, it will be remembered, contained one very objectionable provision, viz.: that architects were to state, in their report accompanying the drawings, the percentage on the estimate which they would expect as their professional fee. It was also required that the plans for the chapels, offices, and lodge were to be to a scale of $\frac{1}{4}$ in. to the foot, and that, in consideration of the payment of premiums of 50*l.*, 30*l.*, and 20*l.*, the Corporation proposed to retain three of the designs as their property. We are glad to learn that the Cemetery Committee have again considered the conditions, and competitors have been informed that for the present the conditions have been withdrawn. Revised conditions are to be issued and the time for sending in designs is to be extended. We congratulate the committee upon their decision.

Tynemouth Castle and Priory. We read that the Trinity House propose to destroy the lighthouse tower in the garrison yard when the new lighthouse on St. Mary's Island is finished, and that the site of the governor's house will be taken for purposes of the artillery quartered in the Castle. The fortress buildings surround the ruins of the Benedictine Priory, dedicated to SS. Mary and Oswin, the whole covering about seven acres on a rock rising steeply from the riverside. On the outbreak of the Civil War, Lord Newcastle garrisoned the Castle for the king; in 1644 it was captured and dismantled by the Scots under General

* About 2,500*l.* is required for the work proposed. Subscriptions will be received by the Rev. Alfred Philipps Abbey Dore Rectory.

* These names will not all be found in the catalogue. The French are very humorous in dealing with English names. Mr. Wigglesworth becomes in the catalogue "M. Coigglesworth"; Mr. Joseph is catalogued under the letter D as "Delissa (Joseph)"; and in the New Salon catalogue the address of Mr. Frank Brangwyn appears as "Temple Lodge-Queen, Street Hammersmith, Londres."

the Earl of Leven. During some alterations in 1782, when the towers were demolished, were found various Roman remains, perhaps carried across the river from South Shields for rebuilding the church of stone. The relics included a tablet conjectured to record the foundation of a temple appropriately dedicated to the Winds, and the votive altar whose inscription—

I.O.M. AEL RVFVS COH. III LINGONVM

is taken to refer to a station at the Tyne's mouth, of the 4th cohort of the Lingones. The gateway tower was then converted into barracks, and turf-covered powder magazines were made in the Priory grounds. We recently described and illustrated* the remains of the Priory, founded by Tostig, Earl of Northumberland, on the site of one built by Oswald in 634, to replace a convent erected by his predecessor Edwin, King of Northumbria. John Dudley, Duke of Northumberland, obtained a grant of the property in 1550; on his attainder it reverted to the Crown. Colonel E. Villiers pulled down much of the buildings in 1665, though the nave had continued as the parish church until 1657, when its roof fell in. In 1850 the Duke of Northumberland restored the Lady Chapel, which had been erected by the Percies in the earlier half of the fifteenth century; the parish cemetery, closed in 1856, was the prior's garden.

EGGENBURG is a small town, little known, in Lower Austria. It contains some very interesting remains of Mediaeval and early Renaissance architecture, and formerly contained many more, but an unlucky fire in 1808 caused great destruction among them. St. Stephen's Church is a fine building, fundamentally Romanesque, but largely rebuilt in the second half of the fifteenth century. It resembles the Cathedral of St. Stephen at Vienna, and churches in Steyr and Krems, in a striking degree. These are known to have been erected under the superintendence of the freemasons of St. Stephen, and it is probable that the Eggenburg church belongs to the same group. It contains a beautiful "sacrament house," dated 1505, and a fine triptych altar-piece. One of the most noteworthy buildings in this old-world town is the "Painted House," a quaint corner house in the market-place, with two bow-windows richly decorated in plaster relief, and with the two exposed sides elaborately ornamented in stucco. It is dated 1547, and from the evidence of coats-of-arms occurring among the ornamentation it has been inferred that the house was built by the Emperor Ferdinand I, and by him made over to Hans Hegenmüller, the tutor of his children.

We have received the Report of the Mansion House Council on the Dwellings of the Poor for last year. It contains a good deal of information as to the work done by the Council in bringing about the sanitary improvement of various quarters of the City and East London, and speaks of the serious problem presented by the rapid increase in the population, while at the same time the available house accommodation is reduced by the requirement of land for other purposes. The following is quoted from

* No. IX., "The Abbeys of Great Britain," February 9, 1893.

an inquiry addressed to the Council at the time the Report was being drawn up: "The housing question in — is at present the most pressing question the inhabitants have to face. Extension of railways, enlargement of schools, and the proposed erection of a large institution have reduced, and will continue to reduce for some considerable time, house accommodation. A short time since our Sanitary Inspector reported but six houses to let in the whole of the parish; and this," adds the Report, "is a parish where there is a population of nearly 100,000."

THE Free Labour Protection Association appears likely to damage the cause which they have taken up by a too indiscriminate crusade against legislative action. It has issued a circular asking for opposition to various bills now before Parliament, among others the Steam Engines and Boilers (Persons in Charge) Bill and the Boilers Inspection and Registration Bill. In regard to the latter the Association says that, "it constitutes undue interference by the State with trade concerns. . . Extends the inspectorship nuisance." To write in this manner will wholly take away the support of reasonable people from the Association. The inspection of factories has done immense good, and Government inspection, within reasonable limits, is approved by all sensible persons; so that to speak of "the inspectorship nuisance" is merely to echo the cry of a few employers who are about a century behind the age. To say, again, in regard to the measure as to the requirement that certificated persons should be in charge of large trade boilers that, "it may work enormous injury and injustice to every employer in the United Kingdom using steam power," is to talk nonsense. Indiscriminate and senseless opposition appears likely to render this Association of comparatively little public value.

THE "Société des Gens des Lettres," whose difficulties with M. Rodin about the statue of Balzac we have before alluded to, have obtained from the Paris authorities permission to erect the statue on the Place Royal. But since the opening of the New Salon, where the statue in question is exhibited, the Subscription Committee and the Municipal Administration are both in considerable perplexity, for the statue at last furnished of the author of the "Comédie Humaine" is so very unsatisfactory in an æsthetic sense that the Municipality are now very doubtful whether they can admit its erection in one of the principal public places in Paris. The question will be submitted to the Council, who it is expected will refuse the statue; and if they are more complaisant, the Government may refuse to ratify their decision, so unsatisfactory is the work considered. This will be a French parallel to the recent case of the removal of the statue of Bright from the House of Commons, in consequence of its unsatisfactory character.

THE Exhibition of the Society of Painters in Watercolours is hardly one of the best that we have seen, though it boasts of a remarkable work of Sir E. Burne-Jones's, the "Perseus and Andromeda" (17), exhibited some years

ago at the New Gallery. Mrs. Allingham only contributes one work, "By the Old Cottage" (2), which however is of course excellent, for this artist never falls below her standard. Two or three bird subjects by the late Mr. Marks are included, of which the finest is the study of a Bateleur eagle (202) on one of the screens. Architectural subjects are rather numerous; among these Mr. Hodson's "Tower of St. Ouen" (13) and "The Market Place, Abbeville" (97) are really good and careful studies of architecture; we have also Mr. R. W. Allan's "Church at Beccles" (51) in Suffolk, celebrated in Crabbe's poetry, Mr. Robert Little's "At Flatford Mill" (71), Mr. Herbert Marshall's "Fleet-street by Temple Bar" (104) and "St. Paul's Churchyard" (124), Mr. Walter Field's "Westminster in the Frost" (151), a view taken from the Embankment opposite the Houses of Parliament, and a large and elaborate view of "The City of Edinburgh" (82), the well-known view from the Calton Hill, by Mr. E. A. Goodall, which is hardly however a work of the first order. Among the best of the landscapes are Mr. Allan's "End of the Rough Weather" (23), a fine view of a bleak sea-coast, and the same artist's "Waiting for the Boats" (109), a small work remarkable for its open-air freshness of effect; Mr. Cuthbert Rigby's "Ennerdale Lake" (4), where the hills in the sunset light are very fine, but the water is rather weakly treated; Mr. Eyre Walker's "An Old Thorn, north Yorkshire Coast" (94), one of the finest works in the room for power of colour and effect; Mr. Napier Hemy's "The Coming Storm" (112), a smaller edition of a scene which he has already painted in oil; two or three of Mr. Phillip's powerfully built hill scenes, of which the finest is "Schicollion" (143), not equal however to some which he has exhibited here; Mr. Evans's "Rising Tide, Mount St. Michel" (139); Mr. Goodwin's "Stromboli and the Lipari Isles" (135), a gloomy scene with a very peculiar treatment of the sea; and a carefully studied view by Sir E. Poynter of "The Rhone Valley" (191), which, like most of his small landscapes, contains an immense amount of detail, and suggests the idea of a large picture reduced through a diminishing glass. Mr. Brewnall's "Witching Time of Night" (19) and Mr. Clarence Whaites's "After the Deluge" (126), are somewhat fantastic conceptions which do not appeal to us. Mr. Goodwin has sent a water-colour repetition of his picture which was exhibited at the Academy under the title, if we remember right, of "Christmas Eve," in which an aerial cathedral is built up in the sky; it is here called "The Vision of the Keepers of the Sheep" (15), and is no doubt a very remarkable effect, but belongs a little to the theatrical order of painting, which is not the most wholesome.

THE new penny (*dicime*), engraved by M. Daniel Dupuis, is being struck at the French mint. The piece, which is to our thinking rather too low in relief, represents the head of the Republic on the obverse, surrounded with laurels, and on the reverse a seated figure of a woman in a helmet, holding in one hand an olive branch and in the other the French flag, which overshadows the figure of a child representing "Toil," and holding in one hand a sheaf of wheat and in the other a hammer—rather an odd confusion of

pol. The whole coin has a very artistic appearance, but looks a little more like a medal for the cabinet of a collector than like a coin for everyday use.

PICTURES AT THE ROYAL ACADEMY.

It cannot be said that the Royal Academy exhibition of this year is one for Englishmen very proud of. It is true that it contains very fine works among the pictures which occupy central positions in the different halls, and that the portraits of the year show unusually high average of artistic merit, but fortunately we have to confess at the same time that for the finest subject picture and the best set of portraits of the year we are indebted to American artists. There are some paintings by English artists no doubt, but it is an almost larger proportion than usual in commonplace, and some of the best English pictures are not up to their usual standard this

year. The picture of the year is undoubtedly Mr. Watts's scene from King Lear (138), where Cordelia, after her rejection, takes leave of her father. If the picture hardly displays the same extraordinary vitality and originality as the picture of the year, it is a scene of two or three years ago in the other hand better balanced in composition and finer in colour. Cordelia, alone at once gentle and dignified, stands in the centre of the picture, addressing Regan and Lear who are posed on the left, the one lifting the skirt of her voluminous red dress, and the other with the ends of her fingers, as if maliciously mock curtsy, and with an insolent laugh on her features; the other sister, seen in profile in a dark dress, watches Cordelia with a serious and haughty scorn. On the right is a general movement of people outwards, and in the midst of which the bowed figure of Lear, supported by two pages, moves away with his back to the spectator; a figure of pathos. The whole picture is alive with interest, and is remarkable in this sense as well as its dramatic characterisation of the scene. It is a great success, and is a good recompense for the comparative failure of the artist's Hamlet of last year.

The large room contains three of the finest figure-subjects of the year, two of an antique and one modern; the latter being Herkomer's picture (198) of the Crimean army grouped under the Crimea monument at Waterloo-place on the day of the Jubilee procession, cheering as the Queen passes. The picture rather recalls the same painter's great success a good many years ago in "The Last Year"; it is the same class of subject and contains the same problem, having to deal with a number of figures in scarlet uniform out making the picture staring and monotonous in colour. In this respect the new picture is quite as successful as the old one; and the artist has given the opportunity for variety in detail by the general mass of red is contrasted and offset by the bronze figures on the monument behind, to which the painter has restored actual bronze tint, ignoring the layers of red paint. The picture is only less interesting than "The Last Year" because interest of the subject is less general and effective—it is more of a *pièce d'occasion*. Of the antique subjects the larger and more elaborate is the President's "The Skirt Dance," a larger picture of the same subject which treated two or three years ago on a smaller scale under the title "The Ionian Dance." It is very learned and carefully worked out scene, both in regard to the figures and architectural and decorative accessories; it seems to us that the charm and grace of the principal figure in the smaller painting which we noted as the most beautiful thing in the exhibition the year that it appeared have evaporated in this larger repetition of work, where the figure, in comparison with its predecessor, is somewhat heavy in movement and expression; in short, we should probably have admired the larger work if we had not previously seen the smaller one. Mr. Tadema's one contribution to the picture rather out of his usual line of subject; in general he is purely pagan; here he has treated "The Conversion of Paula," a Roman young lady who sits in a dignified attitude on the scroll of a carved table set, a certain look of thoughtfulness and conviction dawning on her lazily hand-

some face as she listens to the discourse of a Christian friend or retainer seated on the right of the picture. The picture is an interesting one as coming from Mr. Tadema, as it not only shows all his usual care and learning in the painting of detail, but also a degree of intellectual interest and expression in the personages which we have perhaps not ever before seen in one of his works, where the figures are usually only so many types clad in antique costume. In this case the face of the Christian preacher (as he may be termed) is really earnest and dignified, and the Roman lady has as much of intellectual and moral expression as one may suppose the countenance of a Roman lady of the decadence to have been capable of. In the same room is Mr. Orchardson's "Trouble" (243), one of his interesting and suggestive pictures in which two figures are grouped together, with a title which implies a good deal without defining anything, and we are left to form our own conclusions as to the situation. Here the story of the picture is more vague than usual; a good many interpretations might be suggested for it; from the artistic point of view it is sufficient that the artist shows the figure of a husband and wife under the influence of some sudden news which agitates them both strongly, and that the painting of the figures and the room and its accessories are in that complete balance of colour and treatment which with Mr. Orchardson has become a second nature in the treatment of this class of subject.

The pathos of real life, as shown by Mr. Orchardson, is more impressive than Mr. Watts's more intellectual allegory, "Love Triumphant" (310). We recognise here the prostrate figures of "Time" and "Death," the latter with the characteristic cold grey drapery which distinguish her in one or two earlier and greater works by the same hand. Love stands above them triumphant; but though the moral is satisfying and consoling, the pictorial effect is coarse and unsatisfactory, and no amount of moral meaning will make it into a great picture. We may find the other extreme in Mr. Godward's "Circe" (442) in Gallery V., a beautiful nude with absolutely no expression or character at all, either of Circe or of any one else. Mr. Godward showed what he could do in the way of fine painting of the figure in his "Campaspe" two or three years ago; he has not equalled that since, even from the point of view of material beauty, and he appears to have no further interest to impart to the figure in the way of expression, character, or colour; "Campaspe" seems to have represented both his best powers and his limitations. Near to the "Circe" Mr. Margeson's figure of a girl seated on the sea shore, under the title "Castles of Sand" (439), is a pretty poetic work. In the same room "historical painting" of the old school is represented by Mr. Seymour Lucas's "William the Conqueror granting a charter to the citizens of London" (440); this is presented by the Corporation of London for the decoration of the Royal Exchange, and in view of its destination as a decorative mural picture the artist has no doubt purposely given it a rather flat treatment which renders it less effective than it might have otherwise been as an exhibition picture; the conception of the Conqueror's personality is quite in keeping with his character, and though we do not find the picture a very interesting one taken alone, one is glad to find that a series of historical pictures of so good a standard is being carried out for the decoration of the Royal Exchange.

Among subject pictures of importance there are not many to add to the few already mentioned. Mr. Monal Loudan's "Endymion" (140) is ambitious in subject but totally devoid of beauty, as far as one can judge where it is hung. Mr. William Stott's "Autumn" (566) in which a symbolical figure draped in red sits in the foreground of a landscape, half hidden amid the vegetation, is an interesting and poetic work, and a worthy successor to one of rather similar style which he exhibited two or three years ago, though not quite equal to it in colour. Miss Kemp-Welch has surprised us by jumping suddenly from New Forest ponies to a historical battle subject: "Early morning in the camp of the Duke of York's army before the first battle of the Roses at St. Albans" (570); but the material of the picture is mainly horses, and the work does not differ so much, after all, from those which the artist has previously exhibited. In the same room Mr. G. Clausen exhibits a large and vigorous picture, "The Harrow" (552), showing a lad in the

middle of a field, tugging vigorously at a big dirty white horse, to make him come round; it is in this artist's usual coarse and crude style of handling, but there is a great deal of power in it, and a kind of elementary poetry of tillage which reminds one of Zola's "La Terre." To the same class of subject, a less vigorous but more truly artistic work, belongs Mr. La Thangue's large picture of "Harvesters at Supper" (608), where two or three reapers are seated in evening light and overshadowed by the tall corn; the picture is perhaps too large for the subject, but it is a fine and serious work. In the same room is another work of serious interest with the same title as Mr. Orchardson's—"Trouble" (657); this is by Mr. John Collier, and is a very simple but very expressive picture; it shows two women of the lower class, one with her head bowed on a table, the other standing regarding her; other details are for the most part avoided; the figures constitute the whole picture, the pathos of which is intensified by the contrast with Mr. Macbeth's large vulgar painting close to (644) representing a fancy-dress skating-rink function. Truly the art of painting is put to multifarious uses in a mixed exhibition for the popular eye.

Among subject pictures there are some, of course, which, though not of the first importance, are of considerable interest, and should not be passed over. Mr. Briton Riviere's "Temptation in the Wilderness" (22), indeed, might be ranked among the important pictures. It represents a rocky and desert scene, with the figure of Christ seated in the middle, bowed as if overcome with weariness. It is a different kind of picture from what we are accustomed to from this artist, and on that account attracts attention. In the same room Mr. Jacobm-Hood also presents us with a work out of his usual line, entitled "Gone Away" (43); a hunting scene in which however the real interest lies in the treatment of the landscape; a ploughed field rising from the foreground to form an artificial horizon over which a white cloud hangs; this is a fine little work of its class. Mr. Waterhouse's large work, "Flora and the Zephyrs" (94) also finds place in the first room, a picture with several draped figures, fine in colour but rather destitute of interest. Mr. Melton Fisher's "In Realms of Fancy" (109) is perhaps in reality to be classed among portraits; it represents two young girls, the younger leaning her head on the elder one's shoulder, and is a very pretty composition, besides illustrating the artist's handiwork in the treatment of costume. Mr. Storey's "In Evening Shade" (130), a landscape with two women about to bathe in the pool on the right, though somewhat academical, is a picture with a quality of style not to be overlooked. The second room also contains Mr. Stanhope Forbes's "October" (152), not the kind of picture one expects from him—a scene outside a village churchyard, the church filling up the greater part of the scene; a picture rather devoid of subject. Mr. Logsdail, in "Going to the Procession" (170) gives us a good piece of Venetian architectural detail.

In Gallery III. Mr. Waterhouse makes a good decorative scheme in his "Ariadne" (211), an exceedingly weak treatment however of the subject in any other sense. M. Bouguereau exhibits one of the best of his subjects of cottage children, "Les Petites Amies" (252); they are all very like each other, and a collection of them would be very monotonous, but taken singly they always, as in this case, assert themselves as perfect works of their class. Mr. F. G. Cotman makes a powerful effect with his night piece, "Harbour Lights, Lowestoft" (276), with the lights reflected in the dark water. "Fortune and the Boy" (321), by Mr. Swan, does not explain itself very well, but gives us one of Mr. Swan's admirably painted small nude figures which are always worth looking at as examples of artistic execution. Among genre paintings Mr. Dendy Sadler is quite at his best in "The Young and the Old" (400), a scene in a tavern where the young man of the party looks at the pretty *soubrette* decanting the wine, while the attention of the two flushed old gentlemen, evidently far gone in good living, is directed to the operation itself of decanting the precious drink; this may be classed among "pictures with a moral." "Memories" (488), by Mr. W. A. Breakspere, is a really fine and pathetic little picture, an interior where a girl is bowed over a table strewn with old letters; this is one of the best and most complete of the

smaller pictures of the year. In "An Idyll of the Sea" (621) Mr. Tuke gives us a bright sunny picture of a white boat on blue water, tenanted by two young people; the girl's richly coloured dress serves to give additional value to the prevalent light tones of the work. Mr. Bacon puts in an appearance with a scene entitled "The Ring" (906)—the wedding-ring to wit, tried on while the parents of the wearer look on; we should think more of this picture were it not for the recollection of the two first works which this artist exhibited at the Academy—"The Interval" and "The Announcement," works which gave a promise that has not so far been fulfilled. Mr. Dicksee's large picture "An Offering" (277) will no doubt be considered by many as one of the leading pictures of the year; it is hung as such, in a central position; but to our thinking it is but a showy and theatrical performance.

In spite of the irreparable loss of Millais, portraiture forms the strong feature of the exhibition this year. One of the best portraits of the year is Mr. Sargent's of Mr. Penrose, painted for the Institute of Architects, on which we have before commented. Mr. Sargent has also several fine portraits of ladies, one of which, however (272), has the defect of representing the sitter (or stander) as absurdly and impossibly tall. Among the portraits may be counted Mr. Shannon's child picture called "The White Mouse" (37), in which the painter has evidently been thinking of Reynolds; the curious little prim face reminds one strongly of some of Reynolds's portraits of children. Dividing the portraits into those which are painted simply as likenesses and those in which special effect of colour or treatment has been sought, we may name among the former, besides Mr. Penrose's portrait already alluded to, Mr. Orchardson's portrait of Mr. Peel, the former Speaker of the House of Commons (330), a perfect example of this class of work; also Mr. Walter Osborne's "Mrs. Noel Guinness and her Daughter" (597). Then we have the portrait *de luxe*, a branch of art to which Mr. Luke Fildes seems to have specially devoted himself, and in which he appears at his very best in his portrait of Miss Blair (220), a noble-looking young woman in a white satin dress and backed by a crimson curtain in the good old theatrical style, and whose pose and style of beauty, it must be admitted, suit admirably with these sumptuous accompaniments. This is not, however, a style of portraiture that one can have much sympathy with from the artistic point of view; as a method of providing family portraits which shall impress the future spectator with the dignity and importance of the family it is admirable; but from any other point of view there is too little character, too much material display. Of the portraits which have a special artistic interest for their treatment one of the most striking in this year's exhibition is Mr. Orchardson's "Mrs. Pattison" (325), a very dignified portrait of a lady in a black dress, seated in a crimson armchair with her hands quietly reposing before her, the whole being harmonised into that peculiar key of colour which is Mr. Orchardson's invention and seems to remain his secret; for, unlike most other successful painters of the day, he has had no imitators, or none who have succeeded in gaining a place in public exhibitions. Among other portraits of special interest are Sir E. Poynter's rather hard but very sumptuous and elaborate portrait of the Duchess of Somerset in a fancy dress as Lady Jane Seymour (179); Mr. Shannon's half length of Miss Mathew (114), remarkable for its bold and free style of handling; Mr. Orchardson's of Miss Fairfax Rhodes (228), in a pale blue dress on a white ground—a very delicate scheme of colour; Mr. Walter Osborne's "Miss Honor O'Brien" (567), an oval half-length with a great deal of character both in expression and colour; Mr. Bonnat's half-length of Mrs. Courtenay Bodley (352); Mr. Carolus Duran's grandiose portrait of the Countess of Warwick (484) and (perhaps more interesting of the two) his smaller portrait group of Mme. Georges Feydeau and her children; and Mr. Melton Fisher's portrait of the Hon. Lilian Baring (521). There are others that we might mention, and indeed the portraits of the year furnish a great deal of matter for study and interest.

English landscape painting of the day does not seem to get beyond a certain point; we have some admirable landscape painters, but at present no great ones. As usual, one may broadly divide the landscapes in the Academy into those which are as far as possible realistic, and those

which aim at interpreting landscape into artistic form. The former is the painting for the general public, the latter for the minority who regard landscape painting as a field of intellectual interest. "It is odd," we heard it remarked once in regard to a very popular realistic landscape painter of the day, "some people admire Mr. —'s landscapes so much, and others cannot bear them." That, was the reply, "is the measure of the difference between those who do not know what landscape painting means and those who do." Gallery V. contains the best examples in the exhibition of both schools. The realistic school is shown in the perfection of its best achievement in Mr. Davis's "Under the Greenwood Tree" (387); and indeed if all landscapes of the realistic school showed such delicacy and finish of treatment and such perception of effects of air and light as are shown here, there might be an artistic revolution in favour of realistic landscape. But Mr. Davis in his own school stands alone. In the same room are Mr. Stokes's "Mountains and Hill" (413) and Mr. Waterlow's "A Moorland Road" (427), the two best landscapes in the Academy, both of them broad and comprehensive in treatment, giving us the feeling and sentiment rather than the mere facts of detail in a landscape. Mr. Johnson's "Through the Forest" (432), near them, is an example of the right method in landscape failing to interest us through want of power and comprehensiveness of conception and treatment; an illustration of what was remarked above, that we have at present some very good but no great landscape painters; there is never any fault to be found with Mr. Johnson's landscapes, only somehow they too often fail to interest one. It is a long drop from them, however, to even the best of Mr. Leader's, that darling of the English picture gallery public, whose river and mill scene, "Where Peaceful Waters Glide" (309), shows the best he can do, and is superior to many of his mechanical landscapes with their regulation ponds or flooded furrows in the foreground. Mr. Hook's landscapes have always, of course, good qualities, but he is hardly at his best this year. Among landscapes of really original power is Mr. North's "The Morning Moon" (571), which is not indeed like nature, for Mr. North goes further than abstracting from his landscape what is not required for the purposes of artistic translation—he puts into landscape colours and effects which only exist in his own ideal; it is a fantasia on landscape rather than a representation of nature; but it has its interest nevertheless. "Opulent Autumn" (930), by Mr. East, is a fine and poetically conceived scene, and Mr. David Murray is at his best, and in the best school, in "Flowers of the Field" (985), a flat expanse of meadow with a vast sky and a thin line of blue distance very carefully and delicately defined. Among other interesting landscapes are Mr. Langton Barnard's "The Haven" (1002), a fine and truthful work which will lead one to look out for this artist's future productions; Mr. Brett's "Trevoze Head" (194), a coast scene, of which the different portions, the sandy shore, the water, and the distant headlands, are each excellent taken separately, but do not seem to belong to the same picture; Mr. MacWhirter's "Morning, Isle of Arran" (206), with too "solid" a sunlight on the sea; Mr. Waterlow's "The Lonely Church" (238), a Norfolk scene, we take it, and very true as such; Mr. Arnesby Brown's "Labourers" (308), a powerfully treated landscape with plough horses as prominent figures; Mr. Farquharson's snow scene (626); and Mr. David Murray's "Above the Mill" (991).

In sea pieces we may claim to be in advance of any other nation at present; our sea painters know the sea intimately, the French painters only give theatrical representations of it; and we are glad to find one of the most powerful of our younger sea painters, Mr. Somerscales, appearing this year with a picture, "The Coming Squall" (959), equal in power to his first exhibit which attracted so much attention. This is a really fine work; the dark water, the threatening mass of cloud stretching upwards from windward, the heel of the ship under the rising wind, combine to make a scene of great power and reality; we seem almost to hear the roar of the white surge under her bows. The artist however, seems to have made an odd oversight as to the scale of the figures seen in the bows of the ship, which are certainly too large for the scale and rig of the vessel. A much larger and a very fine sea painting is exhibited by Mr. Napier Hemy under the

title "Wreckage" (529); the foreground is pier where some men are hauling in things thrown up by the sea, but the real interest of the picture is in the powerful treatment of the stormy sea beyond. Then we have Mr. Fraser's admirable painting (55) of a ship plunging through a rough sea; Mr. Wylie's painting of rough sea breaking on "The Harbour Bell" (883), the sand of the bar itself forming the foreground, and also the same artist's exceedingly fine painting of a large ship, "R.V.S. Valhalla" (937) sailing over the long swell of a fine weather sea, with a remarkable appearance of movement.

"Bending and bowing o'er the billowy swells."

Whatever our other shortcomings in painting there is no other country in which one exhibition could show so much good quality and so much variety in sea-painting.

Of the sculpture we will speak on another occasion.

THE NEW MUNICIPAL BUILDINGS, SOUTHEAST-ON-SEA.

THE drawings submitted in the limited competition for these buildings are now on view, and, as the five competitors have all won the spurs in previous competitions, it may readily be imagined that the assessor, Mr. J. Brydon, had a difficult task in selecting the best designs from five very able ones, and awarding the first place to Mr. H. T. Hare. The modern system in competitions of receiving drawings without name or motto was adopted in this case, but doubtless the assessor could easily have determined the authorship if he had desired to do so, for, without knowing who were the competitors, we had no difficulty in recognising the work of Mr. Belcher, Messrs. Gibson & Russell, and Mr. Mountford. The remaining set of drawings we do not feel sure about, but, as a long shot, should guess Mr. Colclutt for the author were it not for a plan.

When all the designs are admirable, and all the competitors are past masters of the art of winning competitions, it is natural to endeavour to recognise the points which have determined the selection of the assessor. And that we suggest that the assessor has for himself chosen those points as his touchstone, even consciously allowed them to influence his decision. The features of Mr. Hare's design, which, we believe, have contributed to its success are a more compact plan and a closer approximation in elevation to that phase of the English Renaissance associated with the name of "Wood of Bath," than are to be found in the designs of his fellow competitors.

The scheme for their Municipal Buildings, which the Corporation of Southend-on-Sea have in hand is sufficiently ambitious, and intended to ultimately comprise—(1) a Town Hall and Corporation Offices, (2) a Fire Brigade Station, (3) Technical and Science School, (4) a Gymnasium, (5) a Free Library, (6) a Police Station and Court Room. Of these the first three form the subject of the present competition, and space only for the remainder of the site had to be left. The sum which the Corporation intended to spend, according to the conditions of the competition, on the buildings now contemplated was 40,000l., with a per cent. margin, and the selected design estimated to cost 45,000l.

The site is in shape a rhombus of considerable obliquity, perfectly level and of ample area. It has a long frontage to Victoria-avenue, the main road from Southend to Prittlewell and Rochford, and shorter frontage to the London-road and Dowsett's-avenue. The site is almost opposite to the Great Eastern Railway Station, and considering the direction in which Southend is extending, will before long be in the centre of the town.

The designs are lettered for the purposes of identification S, O, U, T, H, O is by Mr. Belcher, U by Mr. Mountford, T by Messrs. Gibson & Russell, and H by Mr. Hare.

Mr. Hare has elected to place his technical school facing the London-road, and the municipal buildings on the Victoria-avenue frontage. The elevation to Victoria-avenue is symmetrical, and the entrance to the municipal building is in the centre. From the entrance is approached a large entrance hall, from right and left of which the principal stairs ascend to the Town Hall and other rooms on the first floor. The lavatories are placed under the stairs, and the cloak-rooms under part of the Town Hall, the remainder being, as suggested in the

culars, devoted to a covered playground, the technical school.

onting Victoria-avenue are, on the left, the es for the Borough Accountant, the Regis- the Medical Officer of Health, and the ctor of Nuisances; on the right are the es of the Borough Surveyor, and at the rear m and store for the overseers. The offices served by a well-lighted corridor, with is for the most part on one side only.

the first floor, with its axial line passing h the centre of the front, is the Town t at the rear, and in front, facing Victoria, the Mayor's parlour in the centre, on axial line of the Town Hall, with the Town k's offices on the left, and on the right com- re-rooms and waiting-room, and the Coun- chamber. Completing the elevation is the akers' residence, approached by the public to the Council Chamber. The planning of the Municipal Buildings is beyond reproach—compact, and yet well lighted, and superior to of any other competitor.

Technical School. Mr. Hare has ntly taken as intended chiefly for use at t, by artificial light, and as in the cons- of competition the full title is rganised Science Day School and Technical ing Classes," it might be supposed that lighting by day is essential. This is inly not provided in many cases, as, for pple, in the lecture hall, the purpose of h in the particulars is stated as "for al Lectures, Examinations, and Meetings."

hall is "to seat 400," is 53 ft. by 40 ft. 21 ft. high, and the windows by which it ighted are 5 ft. 6 in. wide, 5 ft. high, and ills to ft. from the floor. On one side of all there are five of these windows with lding opposite to them 13 ft. 6 in. away 38 ft. high above the sill level. On the side are three windows with a building site to them 24 ft. away and 38 ft. high e their sill. The lighting of the class- is also inadequate for use by day, thus a 20 ft. by 21 ft. 6 in. and 14 ft. high has one window 5 ft. wide and 8 ft. high. We but suppose that Mr. Hare and Mr. on are better informed than we are as to relative extent of the "Organised Science School" and the "Technical Evening ses."

the entrance to the Technical School is from London-road. In front of the lobby are cloak-rooms and the entrance to the lecture-. The cookery class-room is to the left of ground floor, and on the right are secre- s-room, committee-room, common-rooms male and female students, library, and ivers' common-room. On the first floor are lass-rooms of varying sizes, and on the second floor are the art rooms, wood-carving, a museum, chemical laboratory, with de- stration room and preparation room, store a and balance room. In the basement are physics laboratory, with demonstration a and preparation room, and the lavatories. fire brigade station is at the end of the London-road frontage, with engine-room next street, stables behind, and common-room firemen's quarters on the upper floors over tables.

he elevations are simply and quietly treated he dignified manner associated, as we have eady premised, with the name of "Wood, of."

The front to Victoria-avenue has a al pediment on coupled Ionic columns, end pavilions with a tetrastyle arrange- of columns, crowned by a low, flat dome ing in one case the Council Chamber, and the other the museum of the Technical ol. Over the central feature is a bell and a tower of modest dimensions.

he London-road front has also a pedimented re, but with single columns. For the rest the elevation an astylar, two storied ngement of windows is adopted, with ated ground floor and pedimented lows above. No rooms on the second have their windows on either of these ts, and by this means and the small allow- of window space to individual rooms a broad treatment and large wall space is ined.

essrs. Gibson & Russell are the only com- ors who have placed their Town Hall and oration offices to the London-road end of site. Their design, both in plan and ation, is most attractive at first sight, but on r inspection there are several points which assessor might consider inferior to the ed design. Thus the offices on the ground e are served by a corridor 15 ft. wide, which,

having rooms on both sides, is not so well ighted as in Mr. Hare's plan. The cloak- rooms to the Town Hall have only one entrance, and the lavatories are entered from them. The Town Hall has a corridor on each side with the gallery over, thus extending along the sides as well as the end of the hall. The technical school is admirably planned and well lighted for use by day as well as by night. The elevations are treated in the picturesque version of Renaissance, with which the authors' designs for West Ham and Cardiff have made the architectural world familiar, but although very charming, it is perhaps as well that Southend is not to have a model which might be vulgarised by ignorant imitation. The architecture of Southend requires medical treatment, and the Corporation have done well to enlist the services of outside talent, but a sedative draught is what we should feel inclined to recommend rather than the exhilarating prescription of Messrs. Gibson & Russell.

Mr. Mountford's design must have run the selected one very close, and is a masterly piece of planning; but the author has rather made difficulties by adopting the circular disposition of the London-road end, in sequence to his Liverpool success. Such a disposition rather tends to lead to complication, and although the self-made difficulties have been very cleverly surmounted, the simplicity and compactness of the selected design are lost. The perspective does not suggest that the circular end would prove successful in execution, and the front elevation is spoilt by the somewhat fussy figure-carried canopy over the entrance. The design is, in short, far less dignified than Mr. Hare's.

Mr. Belcher's design is, as might be expected, a fine conception, as shown in the perspective drawing; but the elevation of the London-road front reveals a very mean and back street treatment, which is quite unworthy of the situation. The detail is, of course, in the version of Baroque that Mr. Belcher now affects. Comparatively speaking, the plan is diffuse, and the corridors dark and narrow; the Council Chamber is in a quiet position, but with a mean approach, and the entrance is by the side of the Mayor's dais. The school hall is badly lighted, and so also are the cookery instruction room and the manual exercise room, which look into an area 13 ft. wide and 35 ft. deep to their sill level.

The design lettered S is the only one submitted that follows closely the raking line of the site on the London-road side. The entrances to the Town Hall are on an exceedingly grandiose scale, and cost alone would be sufficient to place the design out of court. The plan is somewhat straggling as a result of the grand entrances and the raking frontage. The perspective is beautifully drawn, and shows a fine design, but dependent for its completion on the parts of the scheme which are at present in *sublimis*. In the selected design the building now contemplated is complete in itself. The author of S may therefore be certainly said to have failed by displaying too much ambition even for the Corporation of Southend-on-Sea.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

ANNUAL GENERAL MEETING.

A special general meeting of this Institute was held on the 2nd inst., Mr. H. L. Florence, Vice-President, in the chair.

On the motion of the Chairman, seconded by Mr. W. M. Fawcett, Vice-President, it was resolved, *unanimously*, that the resolutions of the Royal Institute concerning the clause to be added to by-law 9, and the alterations in by-laws 30 and 31, passed at the special general meeting of April 18, be confirmed.

The special general meeting then terminated. The sixty-fourth annual general meeting (the thirteenth general meeting of the session) was then held, Mr. H. L. Florence, Vice-President, in the chair.

The Hon. Secretary, Mr. William Emerson, announced the decease of the following members:—Augustus Laver, Hon. Corr. Member (San Francisco), elected in 1879, and Walter Seckham Witherington, Fellow, elected in 1881.

It was then resolved that the Royal Institute of British Architects do admit to alliance therewith, under the provisions of Section XVII. of the by-laws (Nos. 77-81), the following Society—viz., "The Aberdeen Society of Architects."

The Chairman announced that Mr. Arthur Baldwin Hayward had passed the statutory examination held by the Institute on the 21st ult., and had been granted a certificate of competency to act as District Surveyor under the London Building Act.

The report of the Council for the official year 1897-98 having been submitted and taken as read, its adoption was formally moved by the Chairman, and seconded by Mr. B. Ingelow.

The report contained the following passages:—
"Since the publication of the last annual report on May 6, 1897, the Council have held twenty-four meetings, of which the Council elected on June 14, 1897, have held eighteen. These are exclusive of meetings held by Committees of Council. In the course of the year eight Fellows have been elected, thirty-one Associates, three Hon. Associates, and nine Hon. Corr. Members. The numbers in each class stand as follows:—Fellows, 598; Associates, 1,001; Hon. Associates, fifty-three. The following gentlemen have been elected as Honorary Corresponding Members:—MM. Jean Jacques Winders (Antwerp), Alexandre Charles Arthur, Comte de Marsy (Compiègne, France), Jean Théophile Homolle (Paris), El Conde de San Juanario (Madrid), Johan Louis Ussing (Copenhagen), Settimio Fedele Gerardo Giampietri (Rome), Arnaldo Rodondo Adães Bermudes (Lisbon), Leopold Eidilitz (New York), Valère Dumortier (Brussels). The losses by death to the Institute during the past year have been numerous and serious. They are as follows:—Fellows: Arthur Baker, Daniel Birkett, W. Stevens Cross, James Edmeston, Octavius Hansard, John L. Pearson, R.A., C. J. Phipps, C. J. Shoppee, Associates: Joseph Battye, C. A. Chastel de Boinville, A. J. Forge, C. J. Gladman, George Kenyon, George Orrell, H. Stone Wood. Hon. Associates: Sir Henry Bessemer, F.R.S., the Hon. Charles Alexander Gore, Alfred Morrison. Retired Fellow: George Elkington. In John Loughborough Pearson, R.A. (Royal Gold Medallist, 1880), the Council mourn the loss of one of the most distinguished members of the Institute. Octavius Hansard was for many years a member of the Council well known to most of the older members of the Institute; and James Edmeston for a number of years was Chairman of the Architectural Union Company.

Preliminary and Intermediate Examinations were held in June and November, 1897, in London, Manchester, and Bristol, and Final Examinations in London. During the year 170 gentlemen have been registered as probationers, the number of whom now stands at 988; and sixty-nine gentlemen have been registered as students, the number of whom now stands at 248. . . .

The Board of Examiners, after numerous meetings and anxious consideration, have prepared a new syllabus of the examinations. The programmes containing the new regulations will come into force during the June examinations.

The Royal Gold Medal for the promotion of architecture was awarded in 1897 to Dr. P. J. H. Cuypers (Hon. Corr. M.), of Amsterdam, for his executed works as an architect. Her Majesty has graciously signified her approval that it shall be awarded this year to the President, Professor George Aitchison, R.A., for his works as an architectural writer and for his executed works as an architect. . . .

The following selection from the Institute prize drawings is now being sent round for exhibition at the various allied centres:—Drawings of Clare College, Cambridge, by Mr. Thomas Tyrwhitt (Measured Drawings Medallist), and of Thaxted Parish Church, by Mr. Cyril Wontner Smith (awarded a Medal of Merit in the Measured Drawings Competition); measured drawings and sketches by Mr. Charles De Gruchy (Pugin Student) and Mr. Benjamin Bower (awarded Medal of Merit and 5l. 5s. in the Pugin Competition); designs for a villa and ornamental garden by Mr. John Stevens Lee (Tite Prizeman) and Mr. Thomas A. Pole (awarded Medal of Merit and 10l. 10s. in the Tite Competition); designs for a small country church by Mr. Harbottle Reed (Grissell Medallist) and Mr. W. Stanley Bates (awarded Medal of Merit in the Grissell Competition); measured drawings and sketches by Mr. James B. Fulton (Aldwinckle Student); testimonies of study for the Final Examination by Mr. Percy Morris and Mr. Laurence Hobson (Cates Prizeman 1897), and for the Intermediate by Mr. F. W. Newman and Mr. J. E. Franck.

With regard to the Owen Jones Studentship,

the Council have to report that, the value of the studentship having gradually increased to double its former value, and the wish of the late Owen Jones giving them the authority to act, they have increased the value of the studentship from 50*l.* to 100*l.*, and the duration of the student's tour from eight weeks to six months. They have also decided that, on his return from the tour the student shall submit an original composition in colour decoration on a prescribed subject. . . .

A festival dinner was held on December 2 at the Whitehall Rooms to commemorate the sixtieth anniversary of Her Majesty's accession and the incorporation of the Royal Institute*.

The Council desire to announce that they have taken over from the Architectural Union Company the lease of the second floor of the premises in 9, Conduit-street, at the rent of 175*l.* per annum, the lease to be coterminous with that of the premises already occupied by the Institute. Two rooms are sublet. Of the remaining three rooms, one will be used, for the present, as an office; another has been fitted with bookcases, to afford storage space for the library, which has outgrown its present accommodation; while the third room, to the front, overlooking Conduit-street, is being fitted up as a tea and smoking room. It is hoped that this will be of great convenience to, and much used by, both metropolitan and provincial members. Arrangements will be made for tea and coffee to be supplied at moderate charges.

The Institute has received a large supply of programmes, maps, &c., from the trustees of the Phoebe Hearst Architectural Plan for the University of California, and is distributing particulars to intending competitors.

The report of the Council on the Fellowship question came before the general body, and at a special general meeting, held on Monday, June 14, 1897, nine resolutions were passed, two of which necessitated a change in the by-laws. At a special general meeting, held on Monday, November 13, it was resolved that a change be made in by-law 30, by which the Council remain in office until the last general meeting in June each year, instead of the first, as hitherto.

The Council are pleased to report that they have been enabled since December 31 last to invest the sum of 148*l.* in shares in the Architectural Union Company, and the sum of 97*l.* 11*s.* 7*d.* in 2½ per cent. Consols.

At the Architectural Congress held at Brussels last year in connexion with the International Exhibition the Institute was represented by the President and Mr. John Slater. At the Triennial International Congress of Hygiene and Demography held in April this year at Madrid, Mr. Thomas W. Cutler was appointed to represent the Institute.

The Art Standing Committee report that they have held six meetings since the publication of the last report. Mr. Alfred Waterhouse, R.A., was re-elected Chairman; Mr. Macvicar Anderson, Vice-Chairman; and Messrs. E. V. Mountford and Owen Fleming were re-appointed Hon. Secretaries.

"*Vauxhall Bridge*.—After some considerable amount of correspondence on this subject, Mr. Alfred Waterhouse and Mr. Mountford were favoured with an interview by Sir Alexander Binnie, who exhibited to them his drawings and a carefully prepared model of the bridge. Your Committee are gratified to find that the London County Council have abandoned their original proposal for a steel bridge, and have now determined to construct it of concrete faced with granite.† Your Committee are still in communication with the London County Council respecting the details of the masonry.

New Government Offices in Whitehall.—This subject has received much consideration from the Committee, and, with the consent of the Council, Messrs. Alfred Waterhouse and J. Macvicar Anderson attended before the Committee of the House of Commons to give evidence in favour of a scheme which embraced the widening of the north end of Whitehall westwards, and certain other modifications of the Government proposals for providing a site for the War Office and carrying out the improvement of Parliament-street. The Parliamentary Committee, while adopting some of the suggestions of your representatives, unfortunately appeared to think that the probable

cost of the widening of Whitehall was an insuperable objection to this portion of the proposals. The Chairman of the Committee, however, warmly thanked your representatives for attending and for the trouble they had taken in the matter.

Liskeard Church Tower.—The proposed destruction of the western tower of this church has frequently been considered by your Committee, who, with the consent of the Council, have had some correspondence with the local authorities. The faculty applied for was, in the first case, refused by the Chancellor of the Diocese, but quite recently he appears to have reconsidered his decision, and has consented to the old tower being taken down and replaced by a new one, on the condition that the materials of the old tower are to be re-used as far as possible in the construction of the new tower, and that the height is not to be increased by more than 9 ft. This decision is much to be deplored.

Russell-square.—A letter respecting the alterations of the exterior of the houses in this square having been sent from the Council for the consideration of your Committee, a memorial in the form of a protest against the suggested disfigurement of the elevations was addressed to the Duke of Bedford, which was duly acknowledged by Mr. Alfred Stutfield. Your Committee greatly regret, however, to observe that the alterations are still being proceeded with.

New Bridge.—Your Committee having learnt that the existing bridge is about to be removed and rebuilt from the designs of Sir J. Wolfe Barry, the Chairman, at the request of your Committee, has been in communication with that gentleman.

Sessional Papers.—Your Committee have to record that for the first time for some years no evening has been allotted to them for the reading of papers on subjects connected with Art before the Institute. The Literature Standing Committee report that since the election of the Committee, on June 14, 1897, they have held seven meetings. At the first meeting of the Committee Mr. Alex. Graham, F.S.A., was appointed Chairman; Mr. R. Phené Spiers, F.S.A., Vice-Chairman; and Messrs. R. Elsey Smith and Arthur S. Flower, M.A., Hon. Secretaries.

The appointment of a Librarian having been referred to the Committee by the Council, the matter was carefully considered, and the Committee made a recommendation to the Council that Mr. Rudolf Dircks, who had been acting as Librarian for six months, should be appointed to the post, and this recommendation was subsequently confirmed by the Council. . . .

The Committee desire once more to express their satisfaction with the efficient and zealous assistance they have received in the conduct of the *Journal* from the sub-editor, Mr. George Northover. The Committee have arranged for a further economy in the publication of the *Journal* by altering the date of publication from Thursday to Saturday, whereby the high charges for nightwork are avoided.

The Committee have had under consideration the need of a supplement to the Brandon Catalogue of the library, which was published in 1888, and made a recommendation to the Council to print a supplement to the catalogue of the reference library, bringing it up to date, which recommendation has been adopted. During the past year an important addition to the library accommodation has been made by the incorporation with the library premises of three rooms in the upper floor, one of which is being fitted up with shelves. It is proposed to transfer to these rooms those books in the library which are only very rarely consulted, and to provide in this manner the accommodation so urgently required for the reference library. . . . The Committee have received from the Architectural Union Company a donation of £30 for the purchase of books, a portion of which has been already expended.

The Librarian reports to the Committee as follows:—

During the twelve months ending on March 31 of the present year 172 volumes and sixty pamphlets have been added to the Reference Library, exclusive of periodicals, reports, and transactions of societies, and parts of works issued in serial form now in progress. During the same period ninety-one volumes and four pamphlets have been added to the Loan Library. These figures include the volumes which were received under the White Bequest, and which were not included in the statistics of my last report. The purchases comprise forty-two volumes and three pamphlets for the Reference

and twenty-four volumes for the Loan Library. The attendance of borrowers and readers during the year numbered 3,716 (last year 3,042), the number of works issued on loan being 1,073 (last year, 931) in 1896, 831. . . . Since the beginning of the present year an account has been kept of the number of volumes issued to readers using the Reference Library. This shows that 1,554 volumes were consulted from January 1 to March 31, 1898. The number of tickets issued to other than members of the Institute, or to students and probationers, for admission to the use of both departments of the library, was fifty-six. . . .

The Practice Standing Committee report that they have held the usual monthly meetings, Mr. J. Douglass Mathews having been elected Chairman, Mr. Thomas Harris, Vice-Chairman, and Messrs. Edmund Woodthorpe and C. H. Brodie Hon. Secretaries.

The amended Schedule of Professional Charges occupied the attention of the Committee until December 21, when its consideration was completed, and it was sent, with report, to the Council, who now have it under consideration, assisted by the Chairman and Vice-Chairman of the Committee. The question of the stamping of awards, where it is stated, recognition of the attention of the Committee, and a decision obtained by the Committee from the authorities at Somerset House was published in the *Journal* of February 26 last. An important question as to the construction of Clauses 17, 20, and 23 of the new Conditions of Contract was referred to, and is being considered by the Committee. The attention of the Council was called to the liability of architects, when doing certain works, to obtain licences as appraisers. This matter was referred to the Committee, and is still under consideration. The Council referred to the Committee the Draft Bill of the London County Council for amending the London Building Act 1894, together with an explanatory letter thereon; also a large number of letters received in answer to the circular sent to members requesting opinion as to the general amendments that the Act needed. As the Bill was already before Parliament it was decided to confine the attention of the Committee for the moment to the consideration of the points raised by the draft Bill. This was considered in detail, and a report thereon sent to the Council. The Bristol Society of Architects forwarded a copy of a resolution of the District Federation of Builders, suggesting that risks under the Employers' Liability Act should be insured against, and the amount placed in the contract and paid by the employer. This was referred by the Council to the Committee, who reported that, as the Institute Conditions of Contract provide for the contractor taking all risks of injury to persons, &c., it was, in their opinion, most undesirable to interfere with this or to create a divided responsibility.

The Science Standing Committee report that during the past Session they have held several meetings, with an average attendance of eleven members. Mr. P. Gordon Smith was appointed Chairman; Professor Unwin, F.R.S., Vice-Chairman; and Mr. William C. Street and Mr. H. D. Searles Wood, Hon. Secretaries. They further report on the Results of Experiment for the purpose of ascertaining the strength of different kinds of brickwork was presented to the Institute at the Ordinary Meeting held on December 13. The Committee have presented a report to Council on the subject of standardising the size of bricks, referred to the Committee by a General Meeting of the Institute on March 1, 1897, and are now in communication with the Brickmakers' Association with the object of coming to an agreement on the matter. The subject of proposed Building Regulations for the purpose of reducing the liability of warehouses, &c., to destruction by fire, has occupied the attention of the Committee for several meetings, but no conclusion has yet been arrived at.

The income and expenditure account and the balance-sheet for the year ending December 31, 1897, were appended to the report.

The Secretary then read the report of the auditors, Messrs. E. Woodthorpe and Owen Fleming:—The year's working shows a net profit of 1,16*l.* 1*s.* 11*d.*, this being 516*l.* 1*s.* 11*d.* in excess of the estimated profit. The total cash balance of ordinary funds in the hands of the bankers on December 31, 1897, was 1,568*l.* 17*s.* 8*d.* In addition to this the invested funds have been increased by donations and transfers from income to 4,970*l.* 0*s.* 6*d.*

A general discussion on the Annual Report ensued, in the course of which Mr. Max Clarke

* See our report in the *Builder* for Dec. 11, 1897.—Ed.

† The advantages of stone construction over steel construction were strongly urged by the deputation of the Committee at their interview with the Bridges Committee of the L.C.C.

Secretary of the Science Standing Committee, asked for an explanation of the omission from the printed Report of that Committee of a clause relating to the publication in book form of the results of the brickwork tests as contained in the Report originally sent in to the Council; and moved that such Clause either be inserted in the printed Report, or the words "Revised by the Council" be added after the heading thereof. The Chairman, members of the Council, and members of the Science Committee having spoken on the matter, and the Chairman having pointed out that some misapprehension existed thereon, it was ultimately agreed, on the motion of the Hon. Secretary, seconded by Mr. Matt. Garbutt, that a footnote should be added to the Report stating that the Council would consider the advisability of publishing the results of the brickwork experiments in the form proposed by the Committee. The question of the adoption of the Report was then put from the chair, and it was resolved that the Report of the Council for the official year, 1897-98, be approved and adopted.

The following members were appointed scrutineers to direct the election of the Council and Standing Committees for the ensuing year: office, and report the result thereof to the business General Meeting of June 6, namely, Messrs. H. P. Burke Downing, John Hobbs, J. Hooper, Delissa Joseph, Zeph. King, Hugh Lamus, and others to be appointed by the Council. Associates: W. A. Forsyth, H. Cardewick Langston, F. W. Marks, H. A. Atchell, E. Wimperis, and H. A. Woodington.

On the motion of the Hon. Sec., a vote of thanks was passed to Messrs. Edmund Woodthorpe and Owen Fleming for their services as auditors of the past year's accounts; and Messrs. Zeph. King and F. W. Marks were nominated auditors for the ensuing year.

The Statutory Board of Examiners were appointed as follows:—Messrs. Lewis Angell, Francis Chambers, Professor Banister Fletcher, Ebenezer Gregg, F. W. H. Hunt, E. B. I'Anson, Professor Kerr, J. Douglass Mathews, Lucy W. Edge, Professor T. Roger Smith, Messrs. Jeny, Tabberner and T. H. Watson.

The proceedings then closed.

THE ART UNION OF LONDON.

The sixty-second annual general meeting of the members of the Art Union of London was held on Friday last week in the Lecture Hall of the Society of Arts, 18, John-street, Adelphi. In the absence of the President (the Marquis of Lathom), the chair was occupied by Mr. John Mackrell.

The report of the Council for the past year stated that the year had been chiefly noteworthy to the Society for the production of a plate of more than usual importance. "Richard, Duke of Gloucester, and the Lady Anne" was the most admired picture in the Royal Academy Exhibition of 1896, and the work of etching a plate after Mr. Abbey's masterpiece was entrusted to one of the greatest of living etchers, whose translation of the picture into black and white was so sympathetic and masterly that little, if any, of the impressiveness of the original was lost in the process. A considerable addition to the membership of the Society was expected to result from this production, and it was therefore a grave disappointment to the Council to find from the returns of the Society's representatives, not only that this result had not been attained, but that there had been an actual decline in the number of members. The expense of this production had been exceptionally heavy (more than double that of any recent year), and, in consequence of this, and the falling-off in the number of members, the balance available for prizes was less than in former years.

By permission of Mr. Abraham Haworth, the owner of the original painting entitled "In Manus tuas, Domine," the Council had been able to reproduce for the coming year a work which had been justly described as one of the masterpieces of the Victorian era; and it was so hoped that Mr. C. O. Murray's etching, which had been carried out to the entire satisfaction of the Council and the painter, would attract many new subscribers and prove acceptable to the present members. The picture, which was painted by Mr. Briton Riviere, R.A., for the Academy in 1879, and was selected to represent that artist's work in the Victorian Art Collection at the Guildhall last year, represents a knight clad in armour, riding his terror-stricken horse into the almost impenetrable

blackness of a "haunted" wood. The amount of subscriptions for the year now ending, entered up to the time of the closing of the list, had enabled the Council, after setting aside 2,000l. 14s. 3d. for the works of art presented to subscribers, to appropriate 500l. 0s. 6d. for the purchase of prizes to be drawn for, making, with those awarded as consolation prizes to unsuccessful members of ten consecutive years standing, a total of 189 prizes. Amongst the works of art especially selected by the Council for prizes were an oil painting "The Irish Piper," by F. Goodall, R.A., which was purchased by the Council for 130l. Two bronze statues of "Hero," after Miss M. Giles. Twelve albums in oxidised silver covers, designed by the late Miss Simpson. Twenty copies of an electro-bronze "Medusa" tazza. Twelve copies of a large jeweled vase, by Doulton & Co. Twenty framed proofs in mezzotint, after the late Sir John Millais's diploma picture, "A Souvenir of Velasquez," signed by the late President and the engraver. Turning to events of general interest in the art world during the past twelve months, the report stated that a matter of great importance was the decision of the Government to provide as large a sum as 800,000l. for the development of the South Kensington Museum. The long-continued neglect by successive Governments of this important centre of art education was proved by the evidence given before the Select Committee appointed to inquire into the working of the museums of the Science and Art Department, to have brought about a condition of affairs not only injurious to the efficiency of the museum, but threatening an actual danger to the existing buildings and their valuable contents. On the urgent recommendation of the committee steps had been taken by the removal of the temporary and inflammable structures by which the museum was surrounded, to diminish the risk of fire to which for years past the permanent buildings at South Kensington had been exposed. The safe-guarding of the National Gallery was also advanced a step, as an official promise had been definitely given that as soon as the new barracks at Millbank are ready for occupation those which are now in actual contact with the Trafalgar-square building shall be closed, and the greater part of the space they occupy utilised for the much-needed enlargement of the Gallery. The decoration of the Royal Exchange, a work second only in importance to the adornment of St. Paul's Cathedral by Sir W. B. Richmond, is gradually progressing. A panel representing "Charles I. demanding the five members at Guildhall," painted by Mr. Solomon J. Solomon, A.R.A., was put into position in the early summer, and commissions for two others have been given to Mr. Ernest Crofts, R.A., and Mr. Stanhope Forbes, A.R.A. The subjects selected for the twenty-two wall pictures, seven of which are finished or in progress, had been published by the Gresham Committee, and an appeal was made to art patrons and City companies to help on the work. In St. Paul's Cathedral other parts of the building had been put in hand since the completion of the mosaics in the choir, and if a sufficient amount of money could be raised the decoration of the nave and transepts would be steadily carried on until the whole interior was brought into agreement with the section already dealt with.

Abroad British artists had gained several distinctions, and had done much to advance the reputation of our native school. At Munich gold medals were awarded to Sir Edward Burne-Jones for his "St. George and the Dragon" series; to Mr. C. H. Shannon for his picture, "The Wounded Amazon"; and to Mr. J. M. Swan, A.R.A., for his studies of animals. Mr. W. Strang received a first class medal at Dresden for his picture of "Women Bathing," and Mr. Alfred Drury a medal at Brussels for his statue "Circe"; Mr. J. J. Shannon, A.R.A., was singled out, for distinction at the exhibition in the Carnegie Gallery, Pittsburgh, U.S.A.

On the motion of the Chairman, the report was adopted.

The Dean of St. Paul's was then re-elected vice-president, and the Council were re-elected. Votes of thanks were then accorded to the hon. secretaries, Messrs John Sparkes and T. Buxton Morrish; the lady scrutineers; and to the Council of the Society of Arts for the use of their Lecture Hall.

The drawing for the prizes was then proceeded with, the first prize (Mr. F. Goodall's "The Irish Piper") falling to Mr. W. Dorton, of Leytonstone.

A vote of thanks to the Chairman brought the proceedings to a close.

THE SURVEYORS' INSTITUTION.

An ordinary meeting of this Institution was held on Monday evening in the temporary premises of the Institution, Savoy-street, Victoria Embankment, Mr. Robert Vigers, vice-President, in the chair.

The minutes of the last meeting having been read and confirmed, the hon. secretary, Mr. Penfold, read the ballot list of officers for the ensuing year. Mr. Vigers is nominated for President.

The discussion was subsequently resumed on Mr. H. M. Grellier's paper on "Tithe Rent-Charge Recovery," the following gentlemen taking part:—The Rev. D. Lamplough, and Messrs. J. W. Kemsley, R. N. Holbeche, J. H. Sabin, and D. Watney.

Mr. Grellier having replied, the discussion was resumed on the paper read by Mr. Thomas Blashill at the recent meeting of the Institution at Manchester, on "Lessons from Fire and Panic."

Mr. Arthur Harston said he did not think that a fireproof building had yet been erected, although, no doubt, there were buildings which retarded, to some extent, the spread of fire, and thus gave time to a fire brigade to extinguish it. The nearest approach to a fireproof building was a building composed of materials which would retard the progress of a fire, and such a material was coke-breeze concrete, one of the chief advantages of which was its lightness. It could be used for floors, and boards could be nailed to it, and in this way an air-space could be avoided under the boards. Three or four aggregates had been suggested for a non-combustible floor. Fire-brick was one, but a disadvantage in using it was its weight—which was an important consideration. Another material was pumice, which was an excellent substance, and light, but it was expensive. Coke-breeze had an advantage over the other two materials in that it was a by-product, and could be obtained for 5s. a ton. He had mentioned the three aggregates in the order of their strength; but when once they had been fired, and made red hot, the order was, he had been told, reversed, the fire brick then being the weakest and the coke-breeze the strongest. Shingle, another aggregate, when exposed to great heat expanded and broke up, whereas coke-breeze retained its form and was least weakened by sudden cooling. But it had been said that if subjected to heat of 3,000 deg. for any considerable length of time its homogeneity could not be trusted. Although he had used a great deal of coke-breeze in buildings which he had erected, he had not had much experience of its behaviour in fire. In one case, twenty years ago, in a six-story building, he had constructed a flat roof made of this material—not so much for fireproofing the roof as for providing a useful yard on the top of the building. The roof had been fired two or three times, but a portion of it still remains. The first fire upset a lot of internal face brickwork, but the total cost of repair of the asphalt covering, which was 100 ft. by 40 ft., was only about 16l. Captain Shaw, who was at the head of the London Fire Brigade at the time, raised a strong objection to such a material being used for a roof, since it could not be broken by the firemen when they wanted to let out the smoke and pour water on to the fire from the roof. Had the roof been of slate, a hole could have easily been knocked into it. In consequence of the continual traffic over roofs by the electric and telephone wire men it was becoming more and more important to have a more solid kind of roof over our buildings in the City of London, not only to protect them from fire, but to maintain a waterproof covering, and this was readily provided by means of light concrete, with a covering of asphalt. There was a new substance, viz.: Asbestic, which was worth a trial by architects. It made a non-conducting plaster and it made a good plastic surface; it might be useful for casing the underside of iron girders which supported incombustible floors. As to stairs, stone was often used, but he preferred concrete. There were many kinds of stair-concrete in which the aggregate was stone, coke-breeze not being hard enough. He used limestone chips, but the material had not yet been tested by fire. In regard to match-boarding in factories and places where a large number of people were employed, there were many buildings in London where from top to bottom of a five or six-story building match-boarding

was used. In many large buildings there was a temptation to use match-boardings, but it was a very improper thing to do. There was a room in London, celebrated for its acoustic properties, where match-boardings was used round the walls, and the acoustic effect was said to be largely due to the boarding; but it could have been better obtained by the use of large thin slabs of fine concrete attached to the wall, leaving a slight space at the back of each. Nobody would have been able to see what the construction was, though had it been possible to do so it would not have mattered. Such a method would be fireproof; at the worst the slabs would only become friable under great heat and fall to pieces. In dealing with the ground floor of a building where coke-breeze was used, an impermeable surface must be put either below or above the coke-breeze, otherwise the ground-damp would come through and get to the boards which were placed on the coke-breeze. A herringbone wood flooring might be used, attached to the concrete by a mastic, which would form a damp course. A good way of dealing with an existing wood floor in order to make it fire-retarding was to put iron saddle-hangers over the joists—though, of course, the floorboards must be taken up, the hangers could be placed at intervals, and concrete three or four inches thick filled in between the joists. He was glad, in common with them all, that Mr. Blashill was the Superintending Architect of the County Council, for Mr. Blashill, who had had large experience, knew the difficulties of practice, and did not meet them as a cast-iron official. He had achieved the difficult task of winning at the same time the confidence both of the Council and of practising architects. He was so considerate and conciliating in dealing with architects, that a professional visit to his office was always a pleasure.

Mr. A. R. Stenning said he agreed with many of Mr. Blashill's remarks. It was almost impossible to make a building of any size actually fireproof; iron and steel were no good in that respect, as the heat and iron soon acted upon them, though no doubt this could be prevented to some extent by encasing them in brick or plaster, unless the fire had got well hold of the building. He agreed that it was important to use fire-resisting materials as much as possible, for any time that could be gained in confining the fire to a small space was an advantage, for the spread of the flames could be prevented. In regard to securing floor boards to fireproof floors, he did not agree with Mr. Blashill or Mr. Harston. He liked to have a little air space between the floor and the boards. A better fixing was provided in having a small fillet, than by merely nailing the boards into the concrete. He thought that good wood beams should be used as much as possible. Sound timber very seldom would burn through: the wood got charred, but did not give way. With iron it was different, for the heat soon expanded the metal, causing it to buckle and the walls to give way. Another means of stopping the spread of fire was in carrying up party walls above the roofs of buildings. Party walls were rather unsightly, however, in private houses; but in warehouses they ought to be carried up 3 ft. or 4 ft. Every precaution against fire ought to be taken in factories, owing to the number of lives in danger. Outside galleries appeared to be the best means for the escape of workpeople from factories, provided windows and doors could easily be opened. He did not know that they need be constructed of anything but iron, for they were not to be used for any other purpose than saving life, and they would be used before the heat affected them. Iron was not a fireproof material, neither was stone, for it flies and crumbles to pieces when overheated. The provision of the County Council as to space round public buildings was an excellent one. It was not only danger from fire that had to be guarded against, but the danger from panic and crush. If people knew there was a good chance of escaping from a burning building they would not crush, and many would escape. It was the duty of architects and surveyors to do all they could to minimise the loss of life and the damage to buildings through fire, and in Mr. Blashill's paper there were many suggestions to that end.

Mr. A. Vernon said that the community were indebted to the London County Council for its careful regulations against fire. If some mathematician of the future tried to put into a formula a calculation of the risk of life from fire, he would probably take the area and the

population, multiplied by some increasing ratio as to the height of buildings. In country places, loss of life from fire in domestic buildings was almost unknown. How were the risks multiplied in towns? and how were they to be removed? The risks were multiplied by the confined area, by the large number who assembled in buildings, by insufficiency of egress, and by the inadequacy of the materials to resist fire long enough to enable people to escape. Any one who visited Chicago, the city of the great fire of 1862, would be surprised to see that every household appeared to be in a state of constant fear of fire. Every window had to have an access from an iron staircase from the ground, or by a balcony which reached to the ground. Chicago, the city which had suffered most from fire, was now the best protected against fire, and in the way of escapes. Every house was provided with an iron fire-ladder. Owing to the increasing value of ground, buildings were made very lofty, and the dangers from fire were consequently increased. Apertures for lifts in them provided the necessary air for fanning flames, and he anticipated the time when lifts would be put outside a building. In New York a building was now being erected which was to contain twenty-four stories; the people at the top would be exposed to great danger if a fire broke out below. In the fire referred to by Mr. Blashill, in a South American city where 2,000 people lost their lives, the architect, in observing beauty of design, made the doors to open inwards, and that was responsible for the great loss of life. In regard to the best means to provide against fire, architects were not sufficiently guarded against flames at present. Their idea of the sufficiency of 4 in. was wrong. Flues ought to be 9 in. Another point was, to secure materials that would resist fire and so allow time for people to escape; and another point was, that every door in a public building ought to open outwards. There should be no room which would be a room of imprisonment, from which there would be no escape: every room should have some independent means of escape—either by verandah or ladder.

Mr. Mann asked whether hollow walls had a tendency to increase the danger from fire. Such walls kept out damp well.

The vote of thanks to Mr. Blashill having been heartily agreed to,

Mr. Thomas Blashill, in reply, said he was chiefly considering fires in relation to danger to life. The first thing was to save life; the saving of property was a secondary object. Mr. Collins, at Manchester, had referred to the proceedings of the London County Council as harassing, and as having no finality; but was that not due to the very nature of the question? Were they not all learners in such matters as fire-protection? And did not the requirements of a public body have to be modified to meet new necessities and dangers? And, after all, the requirements in regard to such buildings as theatres, and the regulations of the London Building Act, could be seen in print and read on, could easily be familiarised with them. No doubt, in regard to such buildings as warehouses, of which there were so many varieties, it was difficult to set down any special requirements; and it must not be forgotten that the County Council was not capricious in its action. Then as to cost, which was another point Mr. Collins referred to; that must be taken together with the question of human life. Many architects were too sanguine, and their faith in chance was remarkable, and in erecting a building they assumed that there would be no outbreak of fire and no panic, whereas the Council took another view—viz., that something might happen—and they insisted upon necessary work being done, cost what it might. Mr. Harston had given some interesting information with regard to the use of concrete, and he (the speaker) could only emphasise what he had said. Such a material as Asbestic, possibly combined with the more fibrous material which was found in conjunction with it, might be made more use of indoors. He hoped to see some such material introduced, as well as wood in thin sections. As to outside galleries, the first theatre to use them was the Flemish Theatre at Brussels, where the whole audience could be taken in or out by means of the outside galleries. There was one theatre in London, the Shaftesbury Theatre, which was designed by the late Mr. Phipps in the same way. He (the speaker) thought that the point might have been considered more. As to the

value of ground, the question often was, What was the value of a site? Was it not that which was left when all proper precautions were taken, and when all money had been spent upon it which was necessary to spend for the safety of the building and the inmates? If the value of the site disappeared in the process he could not help it; so much the worse for the site. He could not give any information as to the effect of hollow wall in a fire. In preparing his paper, he thought that by putting matters fairly and candidly before his colleagues he would get their co-operation; for that was what was wanted. If the architect designed his building with the idea that he must make necessary provisions, and if he did not look upon them as irritating, or as an unnecessary burden, the general character of buildings would be raised. In regard to old buildings he would say a word or two as to the Tabernacle which was ruined the other day by fire. He was told that it took half an hour usually, on a Sunday evening, for the Tabernacle to empty, and the building was destroyed in about that time; and he could not help thinking that if a fire broke out in some other large and old buildings in London the results must be lamentable. In the course of time, when the public demanded it, some regulations might be laid down in regard to old buildings, as there were in regard to old theatres. The meeting then terminated.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A HOME Counties District meeting of the members of the Association of Municipal and County Engineers was held at Wimbledon on Saturday last. Mr. J. Lobley, Hanley, presided, in the absence of the President (Sir A. Binnie), and amongst those present were Messrs. W. Weaver, Kensington; Santo Crisp, Westminster; W. Nisbet Blair, St. Pancras; J. Patten Barber, Islington; A. M. Fowler, Westminster; J. F. C. May, Brighton; J. P. Norrington, Lambeth; P. Dodd, Wandsworth; J. T. B. Eayrs, Birmingham; Greatrex, West Bromwich; W. H. Savage, West Ham; O. E. Winter, Southwark; W. Harpur, Cardiff; E. J. Silcock, King's Lynn; A. E. Collins, Norwich; J. Mann, Sevenoaks; T. Cole, Secretary, and others.

Mr. Donaldson, Chairman of the Urban District Council, welcomed the members of the Association to Wimbledon.

On the proposition of Mr. W. H. Savage, West Ham, seconded by Mr. Cooper, Wimbledon, Mr. G. B. Laffan, of Twickenham, was re-elected honorary secretary to the Home Counties District.

Mr. C. H. Cooper, Asso. M. Inst. C.E., then read a paper on "Municipal Work at Wimbledon." Mr. Cooper stated that the water supply for the portion of the district that was too far above Ordnance datum to be obtained from the Southwark and Vauxhall Water Company, that for the remainder of the district was from the Lambeth Waterworks. The district appeared to have been exceptionally free from epidemics. The annual zymotic death-rate since 1880 had not exceeded 2.3 per thousand, the average being 1.54. The total death-rate during the same period did not exceed 14.9; the average for the eighteen years being 12.37. The population was 38,000, the indebtedness 138,000l., the rateable value 230,000l. For some years the general district rate had kept at 3s. 2d. in the pound per annum. With few exceptions the roads contained separate sewers for sewage and rainfall, the latter being conveyed by a system of outfall sewers to the natural water-courses. The high-level and middle-level sewers gravitated to the sewage works. The low-level sewage was raised an average of 22 ft. by two pumps, raising 166 gallons each stroke. The area of the sewage farm was 73 acres, and 56 acres were under crop with rye-grass, osiers, mangrove, and market garden produce. The table of annual receipts and expenditure on the farm from 1883 to 1897 inclusive showed an excess of receipts over expenditure in every year, except 1892. The sewage brought by the high-level sewer entered the bottom of the receiving chamber of the two high-level tanks. On the floor there was about 5 in. of broken brick about 2½ in. gauge, which formed a screen through which all sewage that entered the tank flowed in an upward direction. This system arrested all the grosser matter, and almost all the suspended matter, found in

sage without the addition of chemicals. The tanks and filters were cleaned once a week, the sewage gravitating to the settling tanks at the sewage works. The effluent from these tanks is run twice over land before passing into the river. The remainder of the sewage flowed direct to the sewage works, where sufficient potash sulphate of iron was added to the low-level sewage before it was pumped, to allow grains per gallon for all the sewage treated; grains of lime per gallon were afterwards added to the sewage in bulk. The sewage thus treated passed along a conduit into one of six settling tanks, which communicated by weirs, and were each fitted with a floating arm and sewage outlet, so that they could be used separately or in series. Each tank contained about 100 gallons of sewage. Every weekday one of these tanks was cleaned out, the sludge being run into the sludge reservoir. The tank thus treated as a rule passed off over a weir at the end of the last tank, and into a series of cast-iron distributing mains laid about 3 ft. beneath the surface, or it could be drawn off by the floating arms which communicated with the main mains. As there was no possibility of quiring land to cope with the increase in sewage due to the increase of population, the trifling capacity of the land had to be increased by converting it into filters. The first filter was constructed in 1876 of burnt ballast, 1 ft. deep, and was still in use, both for storm water and at times as a cultivation filter. In 1893 he completed an extension of 2,900 yards per to the storm water filter and a cultivation filter of 5,300 yards super. Both filters were constructed of material excavated on the site, the clay having been burnt to form the ballast. The ballast was passed through sieves, the large material being used to form a filtering material, which in both filters was 1 ft. deep; in the storm filter this material was not uncovered, whilst the cultivation filter was covered with a layer of 9 in. of fine burnt ballast, and a layer of soil 7 in. thick. In the storm water filter the subsoil drains were spaced 6 ft. apart, whereas in the cultivation filter the drains were 10 ft. apart. A second cultivation filter was completed this year, and ballast was now being burnt for two purposes of cultivation filters, which would be placed at such a level as to take the effluent from the existing cultivation filters. With the exception of six acres near Marlfield, the farm was on stiff clay, and the present farm manager had showed that the sewage could be cleaned on clay ground. The house refuse and sludge cakes had with the best results been dug or trenched in from time to time, so that there was now 12 in. of fair soil where formerly none existed. The sludge was pressed by compressors at a cost of 2s. 6d. per ton. About 100 tons of sludge cake was produced weekly. As there was now no demand for such product it was proposed to erect destructors in connexion with the electric light station to consume both sludge cake and house refuse. In carrying out the surface water sewers he had used circular concrete sewers with inverts of special bricks in blue Staffordshire clay, which he designed. These inverts formed a modified egg-shape, so that with a small flow the water was concentrated and not allowed to spread as it otherwise would over an elemental invert. Flood-prevention works had been acquired to prevent flooding in the lower portion of Wimbledon Hill-road, and the scheme proposed would convey storm-water direct on to the storm water filters at the sewage farm, so that such water would get a partial cleaning before passing into the stream. Wimbledon Hill had been widened for a distance of 1,500 ft., a feature of the scheme being to preserve the forest and flowering trees, which were now in borders between the carriage-way and path on the north side. The High-street had also been widened from 27 ft. to 50 ft. in width. The depot on the Queen's-road, occupying 3 acres, when completed, would provide stabling for the horses, carpenters' and other workshops for the employees of the District Council. The contract price for the buildings was 9,444/. The present isolation hospital was a corrugated iron building capable of accommodating thirteen beds, and two tents were erected last autumn to provide for additional patients. For some years the authority had considered the question of erecting a suitable hospital, and it was hoped that before long the proposed building might be commenced. The proposed site contained 475 acres, and was estimated to provide sufficient land for 100 beds. The plans provided for a receiving and

discharging block, an administrative block, laundry, and disinfecting block, mortuary, and three ward pavilions. The largest contained in the female side a twelve-bedded ward, and a single-bedded ward, with lavatory annex. The male side was cut off by the nurses' duty-room, hall, and small kitchen. The male side had an eight-bedded ward, single-bedded ward, and lavatory annex. The second pavilion had eight beds in the female and four in the male ward. The third pavilion contained two two-bedded wards, similar to the isolation rooms shown in the Local Government Board memorandum, except that a closet annex was attached to each ward.

Mr. A. H. Preece, A.M.Inst.C.E., electrical engineer, then read a paper on the Wimbledon electric lighting scheme. He said the system which had been adopted was the high-pressure alternating current system. The electrical energy was generated by alternators at a pressure of 2,200 volts, and whenever it was required for use in lighting was transformed down to the safe pressure of 200 volts. The engines and alternators first installed would consist of three Willans engines coupled direct to three Crompton alternators with exciters. The output of each set would be 120 kilowatts. The estimated expenditure was 32,000l.; and the annual expenditure for generating, interest, and sinking fund, 4,200l. The income was estimated at 2,000l. from the public lighting, and 1,750l. from private lighting. That was to say, the extra cost of the improved public lighting would be about 450l.; but this was likely to be reduced as the demand for private lighting increased. The utilisation of house refuse was to be tried in connexion with the electricity works, and he hoped that in the daytime, and perhaps after midnight, the steam generated from the dust would be sufficient to supply both the pumping works and the electricity supply works. He had no reason to doubt that the streets of Wimbledon would be economically and well lighted by electricity, that the private supply would be well taken up, and that the destruction of the refuse would enable the ratepayers to get full benefit from the investment of the moneys under their control in these commercial undertakings.

In a discussion which took place, Mr. Fowler, Westminster, said there were great differences in the qualities of lime as a precipitating agent. Chemists in experimenting with limes had obtained very different results, and the consequence had been that in some cases they had condemned the lime process. Whereas at the inquiry in Salvoire some years ago chemists who had previously reported against lime, declared that for the purification of the effluent discharged into the Ship Canal lime was the best precipitant.

The Chairman, in moving a vote of thanks to the authors of the papers, remarked that Mr. Preece had adopted the electric system for public lighting in Wimbledon, which he had advocated for years, and which he believed he was the first to introduce at Hanley. He regarded Mr. Preece's estimate of the income for private lighting as very moderate, and believed it would be speedily exceeded.

Mr. J. Patten Barber, Islington, seconded the vote of thanks, which was accorded unanimously.

The members then proceeded to the depot, Queen's-road, to view stables and other buildings in course of erection, and to Clarence-road to inspect a system of back drainage adopted for terrace houses and the methods of testing drains. The inspections completed, the members proceeded to the Drill Hall, where they were entertained to luncheon by Messrs. Cooper, Crimp, and Preece. The afternoon was devoted to Wimbledon Hill, to see the effect of the widening of the road to Caesar's Camp, the site of the Isolation Hospital, the sewage farm, and the Conduit and Insulation Co.'s works, Summer's Town. At the works Mr. S. H. Bathurst, M.Inst.E.E., read a paper on "Electric Lighting Practice," and gave a number of experiments, showing the dangers of inefficient and careless wiring.

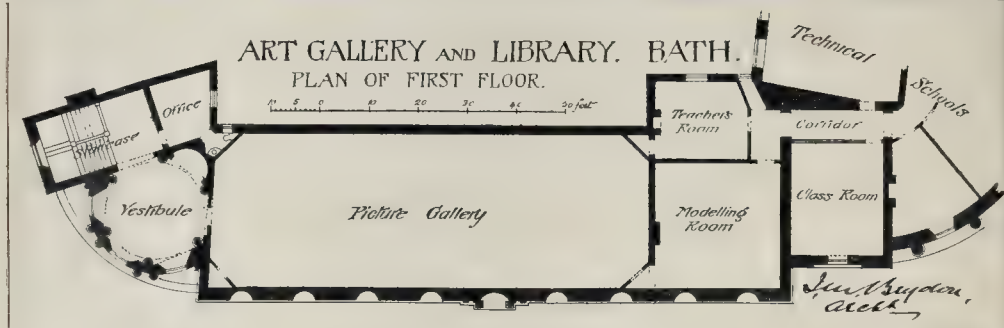
STATUE, MANCHESTER.—Mr. John Cassidy, of Manchester, has just completed his statue of the late Ben Brierley, which has been given to the city by a number of subscribers, and it is to be placed in front of the Museum in Queen's Park. The statue is in Portland stone, and is considerably larger than life-size. It represents the subject standing with the left arm raised and the right arm hanging by his side.

COMPETITIONS.

MUNICIPAL BUILDINGS, SOUTHEND-ON-SEA.—The result of this competition has just been made known. Mr. J. M. Brydon was the assessor, and he has placed first the designs sent in by Mr. H. T. Hare. The drawings which were submitted by the competitors are noticed on another page.

ASSEMBLY ROOM, HITCHIN.—At a recent meeting of the Hitchin Urban District Council, the Chairman said it would be within the recollection of the members that at the meeting of the Council a fortnight previously it was decided that Mr. Burgess should be asked to be the architect of the new assembly room. On April 23 Mr. Burgess wrote that, after carefully considering the matter, he regretted to say that, under the circumstances, he could not undertake the commission. Mr. Burgess felt that before he was consulted, Mr. Geoffrey Lucas should have another trial. [The plan sent in by Mr. Lucas in the limited competition by three architects was placed first by Mr. Mountford, who had been called in to advise the Council.] The Council would like to give Mr. Lucas another opportunity, but they felt that his experience was not sufficient to enable him to satisfactorily carry out such a work as this. It had been suggested that Mr. Millard and Mr. Lucas should do the work; and after receiving Mr. Burgess's letter he saw Mr. Millard, who said he would be pleased to do so, but that it would be better for the Council to avail themselves of the offer of Mr. Mountford to undertake the work conjointly with Mr. Lucas. Mr. Mountford had written to Mr. Lucas a day or two ago saying he was willing to share equally with him the responsibility for the building. It was now a question whether the Council would accept the offer of Mr. Mountford and Mr. Lucas, or whether they would prefer to make fresh arrangements with a new architect. Both Mr. Millard and Mr. Burgess thought that after the strong opinion expressed by Mr. Mountford as to the merits of Mr. Lucas's design, it would not be fair for them to step in and take the matter out of his hands.—In answer to Mr. Moules, the Chairman said the plans Mr. Lucas had submitted in the competition had nothing whatever to do with the new design. Absolutely fresh plans would have to be drawn up. He was inclined to think that they would do well to put the matter into the hands of Mr. Mountford and Mr. Lucas. Mr. Halsey said if Mr. Mountford was not merely to help Mr. Lucas but to take his fair share of responsibility, that altered the state of affairs very much. On the motion of Mr. Seymour, seconded by Mr. Halsey, it was unanimously decided to direct the Clerk to write to Mr. Mountford asking him if he would himself accept the responsibility for the design, &c., of the building, he and Mr. Lucas making their own arrangements as to commission and other details.

ASYLUM, HOLLYMOOR, BIRMINGHAM.—The Lunatic Asylums Committee, in a report to the Birmingham City Council, give full particulars with reference to the competition for designs for the new asylum at Hollymoor. By March 1 eight sets of plans had been received, and were hung in the Council House, the only key to their authorship being contained in sealed envelopes placed in the Town Clerk's strong-room. The City Surveyor then examined the plans, and reported as to the comparative cost of the designs, the differences proving to be not material; and Mr. Hine, the assessor engaged by the committee, spent three days in Birmingham, and issued a report speaking in high terms of the merits of the plans as a whole, but stating that no one plan could be adopted without alteration, and discussing in some detail the three plans, with their accompanying descriptions, which he considered to be the best. The committee then invited him to a conference, which took place upon April 1 last, when he made a further verbal report, expressing more emphatically his own opinion that the author of the plan and report marked "Forward" had the best claim to be selected as the architect of the new asylum. Upon this the committee passed a unanimous resolution following his advice; and upon opening the sealed envelope, the plan marked "Forward" proved to be that of Messrs. Martin & Chamberlain. The committee now propose to authorise that firm to prepare the necessary plans for submission to the Council and to the Commissioners in Lunacy.



Illustrations.

TOWN HALL AND LAW COURTS, CARDIFF.

HERE is little to add to the notes that accompanied the publication of the competition drawings in our issue of December 25 last. The design has been slightly modified with regard to the angle pavilion and the tower, the latter having been brought out to the line of the west front, so that it is over the main business entrance to the Town Hall and immediately facing the grand entrance to the courts. The dome on the south front marks the chief entrance and council chamber.

The avenue, it will be remembered, is an existing one, and is shown undisturbed, except where it is crossed by the road along the main front of the buildings. The law courts on the left of the drawing have façades similar in detail to those of the Town Hall.

Plans of the building appeared in the *Builder* for December 25.

The drawing is exhibited at the Royal Academy.

THE VICTORIA ART GALLERY, BATH.

THE New Art Gallery, Bath, designed as the city's memorial of the Queen's Diamond Jubilee, is virtually the completion of the scheme originally intended when the technical schools were designed. It is a continuation of the new block of buildings down Bridge-street to the corner of Newmarket-row for a length of about 175 ft. The general lines of the elevation of the technical schools are carried through the new gallery. The gallery proper, with the reference library, &c., on the ground floor, forms the main elevation towards Bridge-street. At the corner of Newmarket-row is the principal entrance leading to the entrance hall on the ground floor and the vestibule on the first floor, with the staircase on the left, and the entrances to the gallery and library on the right. This entrance is marked by Doric columns on the ground floor.

The angle formed by the two streets is rounded off so that the entrance hall becomes hexagonal in plan, the corresponding vestibule above being somewhat similar, but adorned externally with Ionic columns and crowned by a dome, thus investing the angle with much importance architecturally. A separate entrance to the reference library is provided in the centre of the Bridge-street front; above this is provided a niche for a statue of her Majesty the Queen, with the Royal arms above, and on each side are four other niches in the wall of the gallery, to be filled with statues at some future date.

The front is surmounted with a balustrade corresponding to that of the technical schools. Internally the entrance hall and vestibule on the first floor are decorated with columns round the walls, and will be paved with black and white marble. The vestibule will be ceiled with a dome in enriched plaster-work.

From the entrance hall, on the right is the print-room, 38 ft. by 32 ft., and from that again opens the reference library, 50 ft. by 32 ft., the remainder of the ground floor being occupied by a new board-room and a masters' common-room for the technical schools.

The vestibule on the first floor is reached by the staircase to the left of the entrance hall, and immediately facing the archway by which it is entered from the stair is the door to the

art gallery, a fine apartment 80 ft. long by 32 ft. wide, and 25 ft. high, lighted entirely from the roof. It occupies nearly the whole of the first floor, the remaining portion being given up to two additional rooms for the schools. There is also a porters' room on the ground floor, and a curator's room on the first floor, and through communication is provided between the art gallery, the library, and the technical schools for the use of students and others. In the basement, with a separate entrance from Newmarket-row, is the receiving and unpacking room, with a lift for hoisting the pictures to the gallery above.

The general contract was taken by Messrs. Jacob Long & Sons, and the architect is Mr. J. M. Brydon, who has designed the gallery in harmony with the municipal buildings and the technical schools.

The drawing is exhibited at the Royal Academy.

THE DINING-ROOM, STOWELL PARK.

THE illustration is from one of Mr. Belcher's own drawings of the dining-room, Stowell Park, Gloucestershire, which he carried out for the Earl of Eldon.

The panelling, pilasters, and chimney-piece are in oak, and the ceiling in ornamental plaster work.

The drawing was exhibited in last year's Royal Academy.

ABBEY MANSIONS.

THE block of buildings situate at the corner of Victoria-street and Orchard-street, Westminster, has been erected for her Majesty's Office of Works, and comprises nine floors and about 300 rooms, to be used as Government offices. The building is erected in Portland stone with red-brick facings, and is of fireproof construction throughout. The building has been erected and carried out by Mr. W. Rickard, contractor, City-road, at a cost of 95,000*l.*, from the designs and under the superintendence of the architect, Mr. Chas. J. C. Pawley, of Victoria-street. The red facing-bricks were supplied by Messrs. T. Lawrence & Sons, and the Portland stone by Messrs. George Wimpey & Co. It was the concrete roof of this building which collapsed recently, and a description of which we hoped to be able to give this week. The description must be deferred until after the adjourned inquest, on May 9.

ARMY AND NAVY MANSIONS.

THIS building comprises two blocks of residential flats of seven stories, situate at the corner of Victoria-street and Francis-street, Westminster, S.W. It is erected in red brick with Portland stone dressings, and is of fireproof construction throughout. The buildings were erected and carried out by Mr. W. Goodwin, builder, of Hatton Gardens, at a cost of 40,000*l.*, from the designs and under the superintendence of the architect, Mr. Chas. J. C. Pawley, of Victoria-street. The red facing-bricks were supplied by Messrs. Lawrence & Sons, and the lifts by Messrs. Waygood and Messrs. Medway.

DEPTFORD BATHS.—The whole of the rubbed and enamelled slate throughout these baths, a description of which appeared in our issue for April 23, was supplied and fixed by Messrs. Ernest Mathews & Co., of St. Mary Axe.

THE LONDON COUNTY COUNCIL.

THE first meeting of this Council after the Easter recess was held on Tuesday in the County Hall, Spring-gardens, Mr. T. McKinnon Wood (Chairman) presiding.

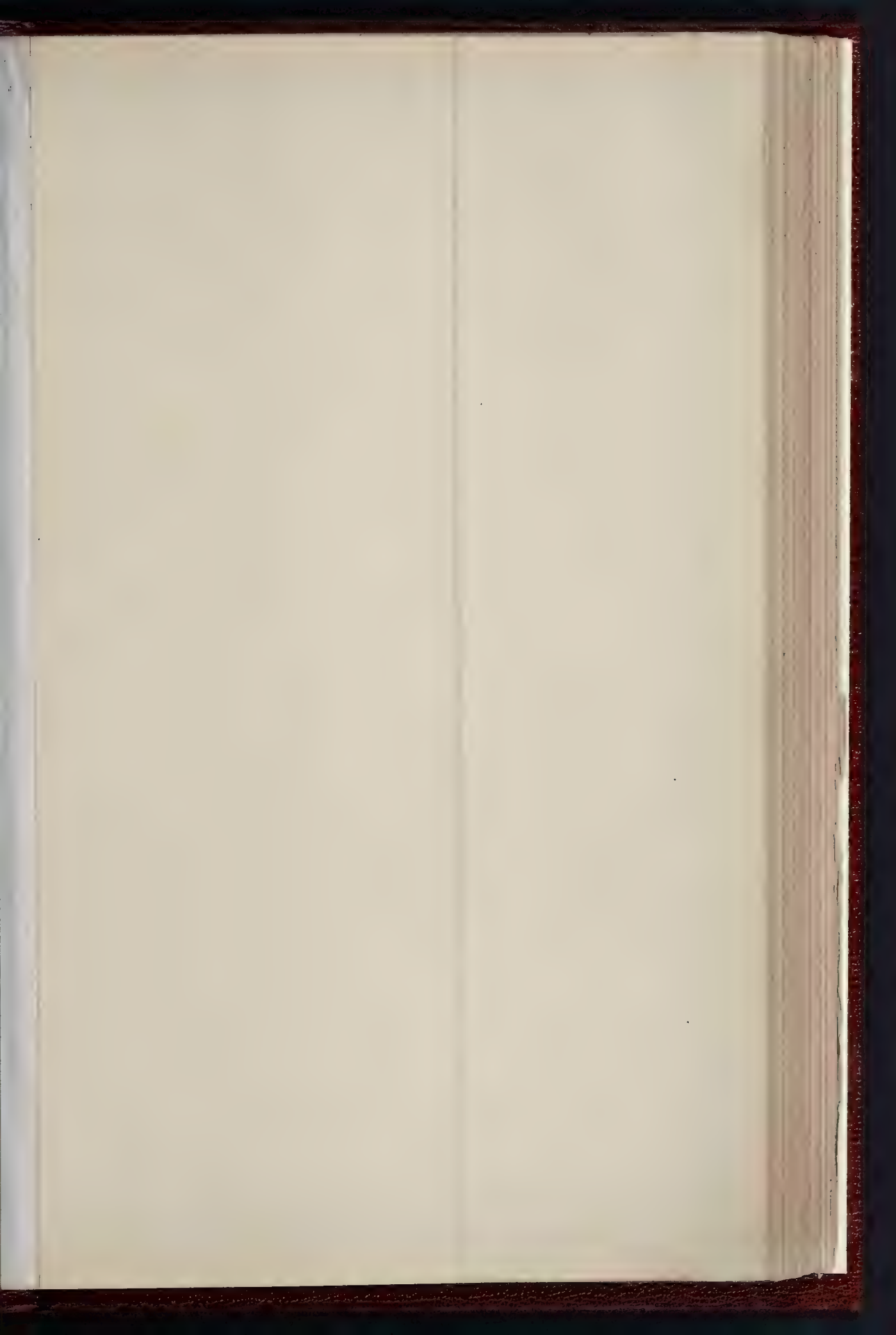
Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Battersea Vestry 1,500*l.* for extension works at the Lavender-hill Library; the Fulham Vestry 4,305*l.* for improvements in Fulham Palace-road, &c., and paving, and 7,252*l.* for the extension of Bishop's Park; the Greenwich District Board 5,130*l.* for the purchase of a site for a parish yard; the Hammersmith Vestry 10,780*l.* for furnishing town hall and offices, and the erection of a coroner's court and mortuary; the Islington Vestry 3,180*l.* for the purchase of rolling stock; the St. George's, Southwark, Vestry 3,000*l.* for the construction of three public conveniences; the St. Pancras Guardians 10,250*l.* for the reconstruction of the workhouse; and the Battersea Churchwardens and Overseers 4,840*l.* for building for parish meetings.

The Annual Estimates.—Lord Welby, as Chairman of the Finance Committee, in presenting the report on the annual estimates for 1898-99, gave a statement of the financial position. He said 1897-98 had been an extremely prosperous year. The total expenditure, estimated at 3,504,000*l.*, was actually 3,444,000*l.*. The receipts showed an increase under nearly every head, and in expenditure there had been a saving under almost every head compared with the estimate. The gross debt in 1897 was 37,301,000*l.*, and in 1898 it was 39,378,000*l.*, and the net debt was something like 20,000,000*l.*. In return for that burden they had a changed London. The total expenditure for 1898-99 was estimated at 3,631,000*l.*, or an increase of 127,000*l.* over the previous year. The Council would have to be prepared for a continuous increase in the cost of the administrative services. As to the Works Department, various changes had been made which it was hoped would lead to economy; but it would be wise for the Department to proceed cautiously, and not to run any risks until it learned by experience what it was able to perform. There was no change suggested in the rate, which would remain at 1*l.* in the pound, and on the whole he thought the account he had to render was a record of sound and prudent finance.

Engine House, Crossness Outfall.—The Main Drainage Committee recommended, and it was agreed, that the erection of the superstructure of the addition to the engine-house at the Crossness outfall be carried out by the Council without the intervention of a contractor, and that the plans, specification, and estimate (5,300*l.*) be referred to the Manager of Works for that purpose.

Conveniences, Victoria Park.—On the recommendation of the Parks and Open Spaces Committee, it was agreed to approve of an expenditure of 1,000*l.* for erecting two sets of conveniences for men in Victoria Park in substitution of the old existing urinals in the park, in accordance with the plans and specification prepared by the architect; and that the work be carried out by the Works Department.

Public Baths, Battersea Park-road.—The Theatres and Music Halls Committee reported that they had considered six drawings submitted on behalf of the Baths Committee of the parish of St. Mary, Battersea, in regard to the new public baths which it is proposed to erect in the Battersea Park-road, with a view



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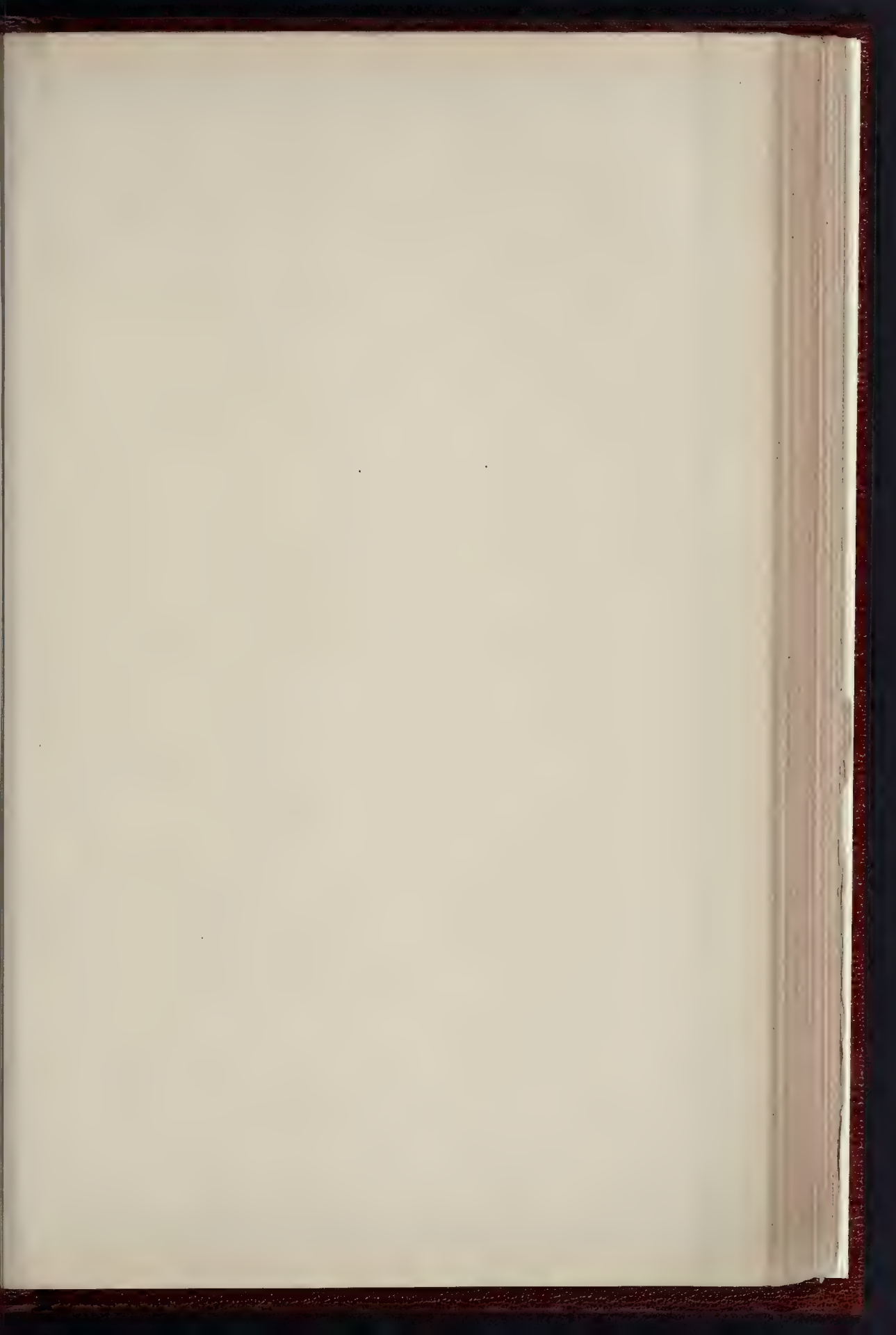
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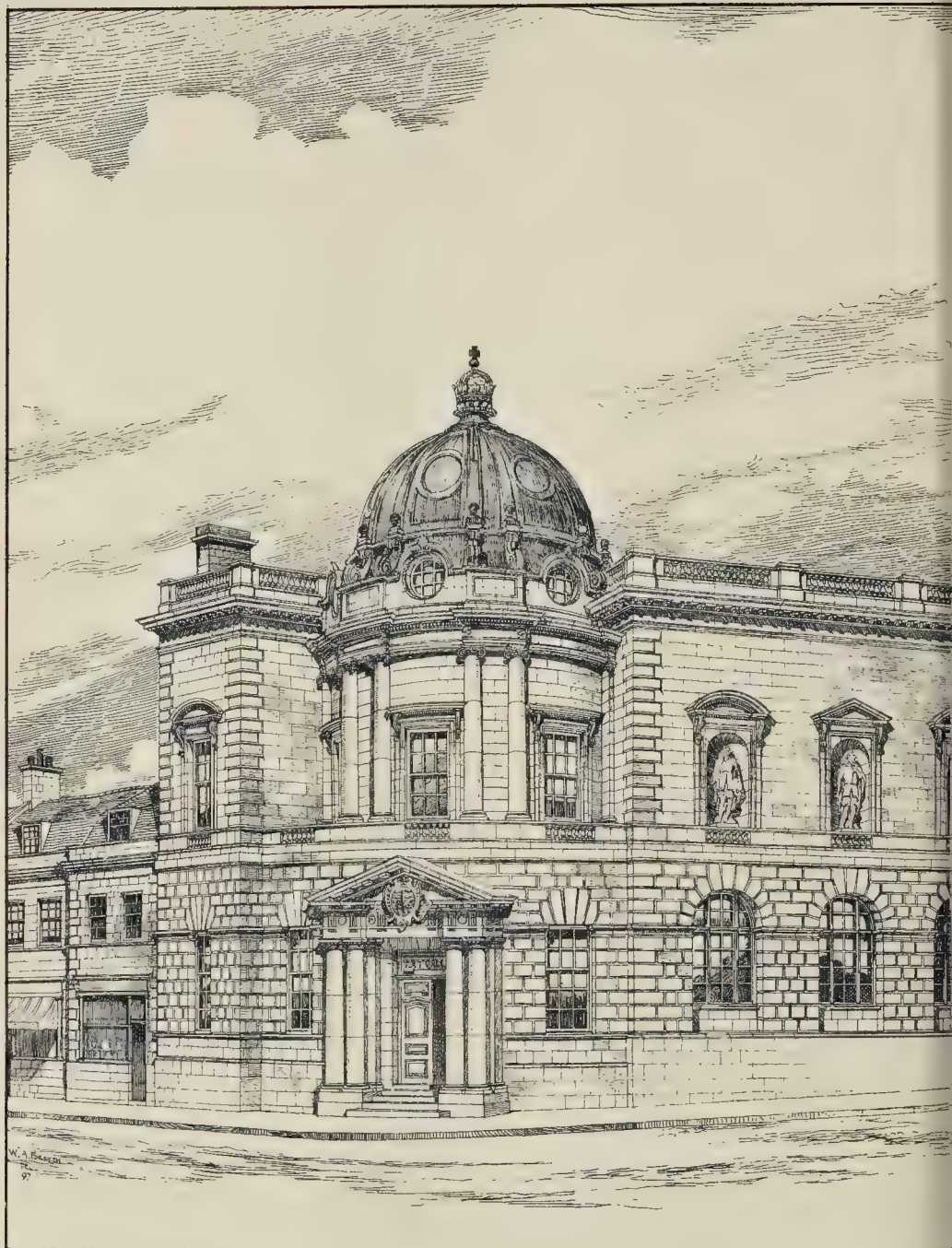
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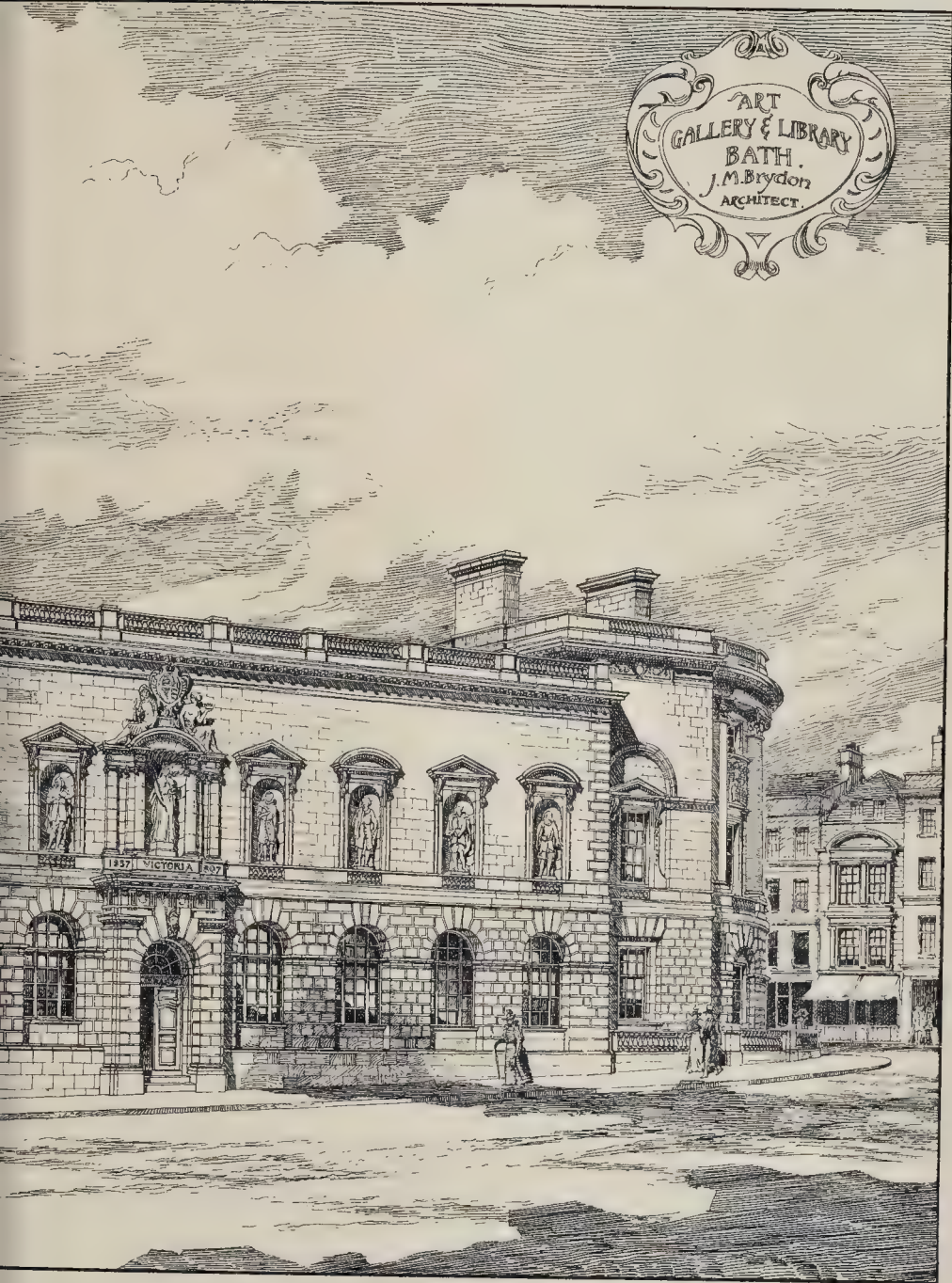
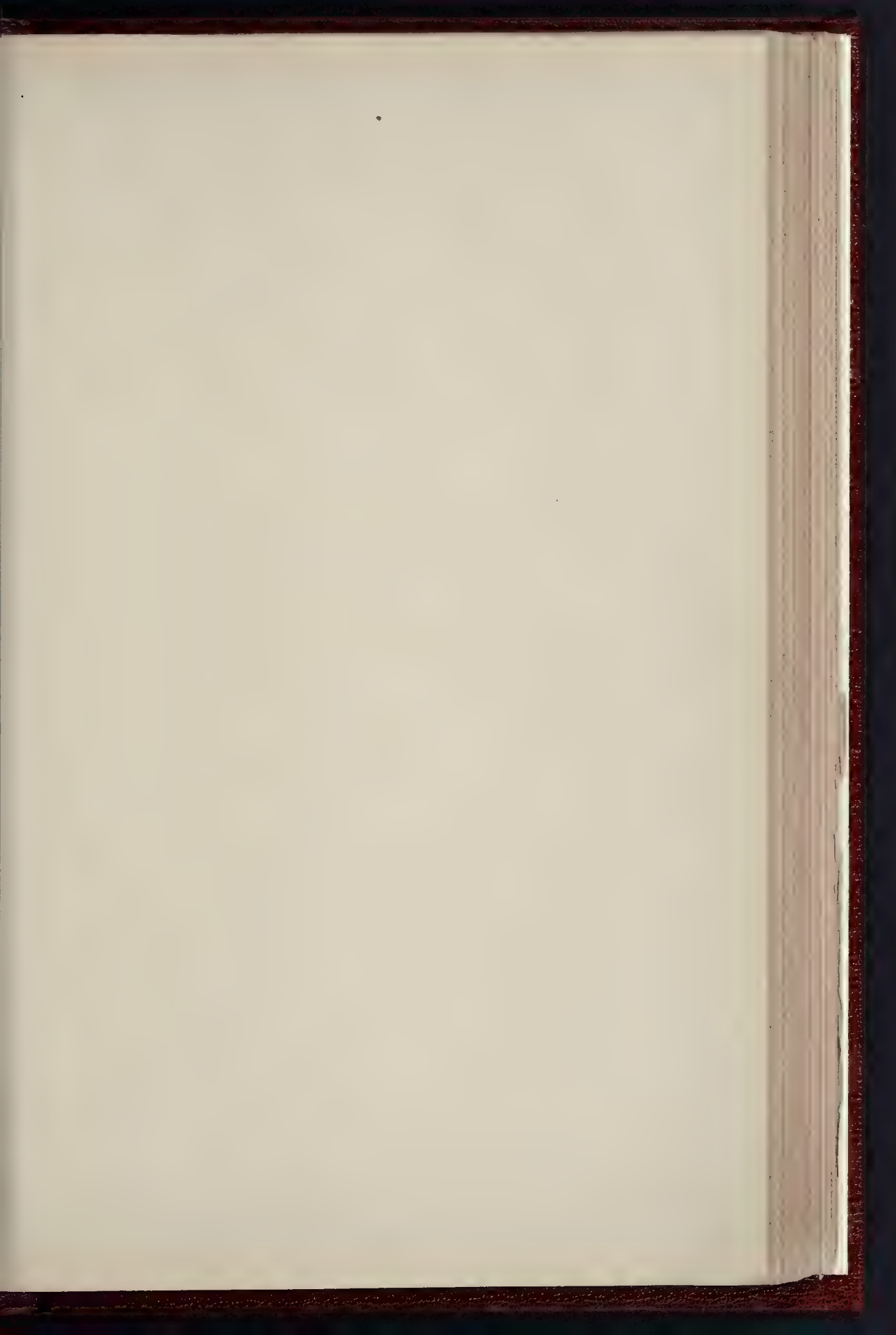


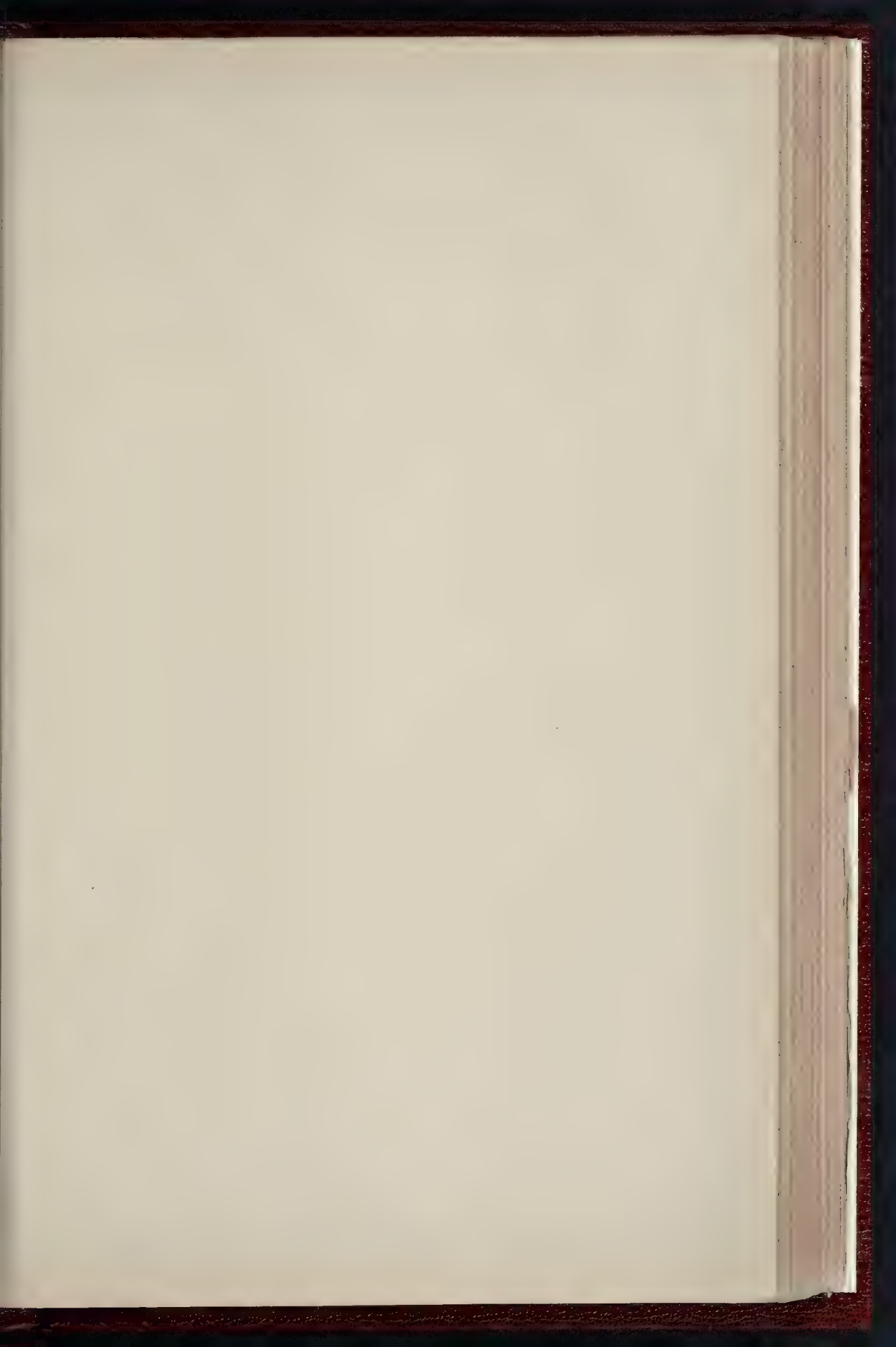
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DINING-ROOM, STOWELL PARK





W. & A. Masons.
Victoria Street, London.
Chas. H. Foxley, Archt.





to a music and dancing licence being subsequently applied for. The swimming bath, which will be used as a public hall, will be cut off from the rest of the hall by fireproof construction, and will be arranged to accommodate 1,056 persons on the ground floor and 400 people in the gallery. The drawings were approved, subject to certain conditions.

Church Schools, Dulwich.—The same Committee also reported that they had considered a drawing in respect of the Emmanuel Church Schools, Barry-road, Dulwich. The building, when finished, will be used primarily for Sunday school purposes, but occasionally concerts will be given in the large hall, and it will therefore be necessary to apply to the Council for a music licence. The site does not comply with the Council's regulations, as only 94 ft. out of a total boundary of 428 ft. front a thoroughfare, but having regard to the purposes for which the hall will be used, they thought it might be accepted as satisfactory. The hall will accommodate about 400 people on the ground floor, and about seventy in the gallery. The drawing was approved subject to certain requirements.

Murphy Memorial Hall.—The same Committee reported that they had considered five drawings, submitted on behalf of the Committee of the Murphy Memorial Chapel, Gurney-street, New Kent-road, in respect of a new hall which it is proposed to erect adjoining the existing chapel and facing Gurney-street and the New Kent-road. This hall will be used as a chapel on Sundays, but on other occasions for musical entertainments. The site nearly complies with the Council's regulations, and having regard to the limited use that will be made of the hall for public entertainments, they thought it might be regarded as satisfactory. The proposed hall will accommodate 281 persons on the ground floor and 260 in the gallery. The drawings were, subject to certain requirements, agreed to.

Royal Duchess Theatre, Balham.—Drawings showing a theatre which it is proposed to erect at the junction of Balham Hill and a new road to be formed opposite Alderbrook-road, were reported conditionally. The theatre will accommodate 1,278 persons.

Fire Stations.—The Fire Brigade Committee reported as follows, the recommendation being agreed to:—

"In connexion with the erection of the new stations at Lewisham and North Woolwich and the enlargement of the Hampstead and Battersea stations, it will be necessary to serve on various owners of adjoining property notices required by part 8 of the London Building Act, 1894. The notices are in course of preparation, but it is necessary before they can be served that the Council should formally appoint some one to act as its surveyor in the matter. We recommend—that Mr. Thomas Blashill be appointed as the Council's surveyor in connexion with the work of erecting Lewisham and North Woolwich fire stations and of enlarging the Hampstead and Battersea fire stations; that the necessary forms of appointment be prepared by the solicitor, and that the seal of the Council be affixed thereto, and that Mr. Blashill be authorised to sign all necessary notices required by the London Building Act, 1894."

Having transacted other business, the Council adjourned.

THE "SCAMPING" OF MANCHESTER SEWERS.

SIR BENJAMIN BAKER, the arbitrator to whom the action of the Manchester Corporation against Messrs. Perkins, Graham, & Company, in respect to the construction of certain sewers in the city was referred, has made his award. The Arbitrator finds that the defendant company committed breaches of the contract set out in the statement of claim, and that such breaches consisted in part in the fraudulent substitution by workmen employed by the defendant company of works not in accordance with the terms of the said contract for the works which the defendant company were bound to execute, and which the said workmen were employed to execute. "It was the duty of the defendant company and the defendant, James Perkins, to have prevented the said fraud, and to have discovered and remedied the improper substitution of works, and that by the negligence of the defendant James Perkins, or those for whom he and the defendant company were responsible, the defendant failed to prevent or discover the same," but his failure to do this was due to negligence, and that owing to such negligence the defendant "was not

aware of the said fraudulent acts, and that he was not party or privy to any fraud in the matter, and that neither he nor any other director or agent of the company having any duty or authority to make any representations to the plaintiffs on the subject made any fraudulent representations." In respect of the contract in the statement of claim, the Arbitrator finds that the plaintiffs were entitled to retain the sum of 464l. 10s. 2d., and to receive out of court the sum of 1,900l. paid into court by the defendants, and to receive from the defendant company a further sum of 1,849l. In respect of contract No. 11 in the counter-claim the plaintiffs were entitled to retain the sum of 350l. in satisfaction of the breaches of that contract. The Arbitrator further finds that the defendants, Godfrey Heathcote and Richard Jessop Dearden are liable upon their bond as sureties for the defendant company to pay to the plaintiffs a sum or sums not exceeding 1,000l. in discharge or part discharge of such part of the said sum of 1,849l., as the defendant company shall fail to pay in pursuance of the award and judgment entered thereon. Accordingly he directs that the sum of 1,900l. paid into court in the action, and any interest which may have accrued thereon, be paid to the plaintiffs, and that judgment be entered for the plaintiffs against the defendant company for 1,849l., and against the defendants Godfrey Heathcote and Richard Jessop Dearden jointly and severally for 1,000l., but that judgment be not enforced against the last-named defendants except for such part of the sum of 1,849l. as the defendant company shall have failed to pay. He orders that each of the parties shall bear his and their own costs of the action and counter-claim and all proceedings thereon, including the trial, and that the costs of the award, which are fixed at 296l. 15s. 6d., shall be paid, as to one moiety by the plaintiffs, and as to the other moiety by the defendant company. In conclusion the Arbitrator declares that, save as aforesaid, no party to the action or counter-claim is entitled to any relief against the others or other in respect of the matters referred to him.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.—The twelfth meeting of the present session of the Discussion Section of the Architectural Association was held at 35, Great Marlborough-street, W., on the 27th ult. Mr. Matt. Garbutt in the chair, when a paper on "Hospitals, principally those for Isolation Purposes," was read by Mr. J. Humphreys Jones, B.A., illustrated by a number of drawings of isolation hospitals recently erected, or now in course of erection. Mr. Jones described an ideal hospital of medium size, treating in detail the arrangement of the several buildings, their construction, ventilation, heating, drainage, and cost. He gave the following as the accommodation to be provided:—A receiving ward, consisting of a duty-room, with a single-bed ward on either side, with water-closet and slop sink to each; one or more one-storied ward blocks, comprising entrance hall, linen store, space for bath, and a duty-room in the centre of two equalized wards; an isolation ward block, having several wards for single beds arranged on either side of a duty-room, each ward having its own separate water-closet and slop sink; a convalescent block, with wards and adjuncts similar to the acute wards, but of smaller area per bed, with the addition of a commodious day-room, and including also a discharge ward; administrative block; laundry; mortuary and post-mortem room; disinfecting house; stabling and gate-lodge. For materials he advised stock brick walls with red brick dressings, and tile roofs. In dealing with floors he said there was no ideal covering for hospital floors. Terrazzo was too cold to the feet. Pitch pine or teak grooved and tongued was satisfactory, except for the joints, which could not be avoided, and which harbour dirt. He wished some one would invent a material consisting of disintegrated wood, which could be laid in situ like cement, and harden into a jointless and impervious wood floor. Mr. T. W. Aldwinckle, junr., in opening the discussion, condemned covered ways between ward blocks. He did not believe in a separate convalescent block; if one were wanted it could be put at the end of a ward block. The open space under floors was an expensive fad. If provided at all it must be at least 3 ft. high, so that it could be cleaned

out, enclosed with gratings, and paved with asphalt or stone. For floors he thought terrazzo warmed by steam pipes the best, but 1 in. or 1½ in. teak laid on a deal sub-floor was very good. The discussion was continued by Mr. Brodie, who alluded to the scant attention paid to the appearance of the mortuary. It should be treated quite decoratively, more like a chapel for the dead. Mr. Hampden Pratt, who commented on some of the requirements of the Local Government Board, said he thought the height of small wards unnecessarily high at 13 ft. Mr. Hopkins complained of the general ugliness of isolation hospitals. Mr. A. Saxon Snell, who attended the meeting as special Visitor, congratulated the author on his practical paper, and added the following criticisms and remarks: It was quite possible to make a hospital look well and answer scientific requirements at the same time, as, for instance, one at Henley-on-Thames designed by Mr. Keith Young. The mortuary need not be absolutely bare and plain; the fittings might be of teak. There should be no flower beds next ward walls. He often thought there was a lesson to be learnt from the Crimean war. In the great hospital at Scutari the sick and wounded died like flies; in the tents on the hillsides, with two feet of snow around them, the sick and wounded got well. Why not use tents for isolation hospitals? A place that could be thoroughly cleansed periodically was the most successful. At the London Fever Hospital the wards were white-washed every three months. Inspection windows were not much used, but they had a moral effect on the patients. Wards should have a central stove with fire facing up and down the ward and a descending flue. As to floors, he thought teak unsuitable on account of its dark colour, which prevented dirt being easily detected; he had found Canadian maple preferable. He condemned mechanical ventilation, and thought the cross-ventilated lobby a fraud. It was of no use unless the windows were always open.—The next meeting will be held on the 18th inst., when a paper will be read by Mr. T. W. Aldwinckle, junr., on "Recent Sanitary By-laws."

BRISTOL SOCIETY OF ARCHITECTS.—The annual general meeting of this Society was held at the Fine Arts Academy, Queen's-road, Mr. F. W. Wills in the chair. The President, Mr. W. L. Bernard, and Vice-Presidents, Messrs. Joseph Wood and W. V. Gough, were re-elected, and a vote of thanks was accorded to the retiring Hon. Secretary, Mr. W. S. Skinner. Mr. H. Dare Bryan was elected Hon. Secretary for the ensuing season.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Edinburgh Architectural Association visited St. Mary's Cathedral and Wester Coates House on the 23rd ult. In the chapter house, Mr. James Bruce, who conducted the party, gave a sketch of the story of the building of the Cathedral, from its foundation by Barbara and Mary Walker to the capping of the spire in 1879. The members made an examination of the planning, construction, and design of the cathedral, and Mr. Henderson, architect, described the marble altar recently erected in the south choir aisle. The song school was next visited.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of this Society was held on the 26th ult. at the School of Art, Arundel-street, the President, Mr. R. W. Fowler, F.S.I., in the chair. The hon. secretary (Mr. C. J. Innocent) read the eleventh annual report of the Council. This stated that the Society is in all respects in a better position than at any previous period of its history. Financially, the Council state, the balance in hand is the highest that has ever been reported, notwithstanding a special course of class lectures during the present year, and that nearly 20l. was expended in 1896 in some valuable additions to the library, and over 30l. in a conversation. One of the Fellows of the Society, Mr. E. M. Eaton, A.M. Inst. C.E., has made a donation of 15l. to the funds for improving the library. Numerically, the Society has continued to grow. There are now 114 members, consisting of thirty-one Fellows, forty-three Associates, eighteen students, five honorary and seventeen lay members. The Council have heard with very great regret of the death of Mr. T. H. Wilson, who had been a Fellow from the formation of the Society, and of Mr. B. D. Wingham, who was one of its earliest lay members, and who presented some interesting Roman tiles to the Museum. In consequence of the valuable additions recently made to the library, it has

been thought advisable to insure the Society's property from fire; and in order to admit of the free use of the books, three members have, at the request of the Council, consented to take charge of the library, viz., Messrs. D. L. Hemmell, S. L. Chippling, and W. J. Beall. The lectures of the session have been well attended. The attendance has averaged about double that of former years. The annual excursion was made in June to Chatsworth. Shortly after the last annual meeting, and as the result of a desire then expressed, the honorary secretary convened a meeting of associates and students to consider the best way of organising classes for the study of scientific subjects. After several meetings and very earnest deliberation with the Council of the Society, it was decided to endeavour to arrange for a series of class lectures by Mr. Hugh Stannus. The lectures comprised—Mouldings—origin, function, names, individual treatment, mouldings in groups, modifications and applications to features; the walls—proportion, thickness, and fenestration; the order—sub-divisions, application, and pediments. The last annual report referred to a competition for a police and fire brigade station for the Corporation of Sheffield, in which the assistance of three members of the Society, Mr. C. Hadfield, the then President, Mr. E. M. Gibbs, ex-President, and Mr. C. J. Innocent, Hon. secretary and past President, had been sought as assessors, and which was limited to members of the Society practising in Sheffield. The three assessors prepared the instructions to competitors, and made a careful examination of the designs submitted, and reported. The report was adopted by the City Council. There has also been a competition in connexion with the Woodfinch Trust, in which the Council of the Society were invited to revise the conditions and instructions, and their suggestions were adopted by the trustees. Two sets of buildings were required, viz., almshouses at Brocco bank, and a convalescent home at Whiteley Wood. The competition was limited to members of the Society, and Mr. E. M. Gibbs acted as assessor. The attention of the Council of the Society was drawn by some of its members to the difficulty of obtaining copies of the Corporation by-laws relating to buildings, and that inconvenience was caused thereby. A letter was addressed to the Town Clerk on this subject, asking that if any alterations or additions were likely to be made to the by-laws or regulations the Council of the Society might have the opportunity of perusing the draft, and making suggestions thereon. An acknowledgment to the letter was received. A communication has been received from the Royal Institute of British Architects upon the advisability of the adoption of one uniform size for bricks, and after considering the suggestion the Council replied that it was not practicable. The prize drawings of the Royal Institute of British Architects have been lent for exhibition in Sheffield this year, and have been visited by a considerable number of the members. Several individual members of the Society have received communications from the secretary of the Sheffield Master Builders' Association; the Council of the Society convened a meeting of members on January 25, 1898, to consider the questions raised, when the following resolutions were passed:—1. That the deposit of priced schedules or priced bills of quantities with each tender submitted is not usual or desired. That the successful contractor does, and should continue to, deposit with the architect or surveyor a priced schedule or priced quantities to be used by him for all the purposes of the contract, and for those purposes only." 2. "That as the execution of work within a stipulated time is of the essence of the contract, liquidated damages must be provided for in the agreement, subject to extension of time for bad weather, fire, and strikes of workmen." 3. "That the architect for the building is usually the arbitrator in the event of any dispute, and should continue so to be." On these being communicated to the master builders, the latter proposed that the Society should receive a deputation representing the Builders' Association. This the Society agreed to do, but the arrangements were left to the incoming Council.—The Hon. Treasurer (Mr. F. Fowler) read the balance-sheet, which showed 121l. 18s. 7d. in favour of the Society. The report and accounts were adopted on the motion of the President, seconded by Mr. C. Hadfield. On the motion of Mr. F. Fowler, seconded by Mr. J. Smith, it was decided to invest 100l. of the balance in hand as the nucleus of a reserve fund. On the motion of

the President, seconded by the Vice-President, and supported by Mr. Fenton, a cordial vote of thanks was passed to the Hon. Secretary (Mr. C. J. Innocent), who declined re-election. Mr. Fowler said when Mr. Innocent accepted the office, four years ago, there were sixty-nine members, and now there are 114; the balance in hand at that time was 41l. and now it is 121l. No one could have worked better for the Society than Mr. Innocent, and no one could have done so much honorary work, and his efforts had placed the Society in an exceptionally prosperous and influential position. In acknowledging the vote, Mr. Innocent said it had been a pleasure to him to work for the Society, and to see it prosper. Thanks were also passed to the other officers and the Council, and it was decided that in future some paid assistance should be provided for the Hon. Secretary. The ballot resulted in the following elections for the ensuing year:—President, Mr. R. W. Fowler; Vice-President, Mr. J. Smith; Hon. Secretary, Mr. W. C. Fenton; Council, Messrs. C. Hadfield, E. M. Gibbs, C. J. Innocent, T. Winder, A. Smith, Denton, J. R. Wigfall, and J. B. Mitchell-Withers.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, Mr. W. Worby Beaumont, President, in the chair, the discussion on the paper "On the Protection of Underground Water Supplies," read by Mr. John C. Thresh, D.Sc., M.D., at the last meeting, was resumed and completed.

ARCHÆOLOGICAL SOCIETIES.

NEWCASTLE SOCIETY OF ANTIQUARIES.—On the 27th ult. the monthly meeting of the Society of Antiquaries of Newcastle was held in the Castle, Mr. Cadwallader J. Bates in the chair. Mr. R. O. Heslop stated that a portion of the Town Wall had been discovered in excavating beneath the Exchange, on the Sandhill. The discovery had been made, in the first place, of three large balls of sandstone; secondly, of four more, and as the work proceeded, outside the Exchange, at a depth of between three and four feet, a complete set of fourteen balls was discovered. The curators had been able to secure the greater part of this find for the Castle, and they were now in the guard room. He thought that the balls were missiles fired from the keep of the Old Castle. Some of the balls which were got from the River Tyne were inscribed with the Roman numeral XII, and some of those now found had the corresponding numeral. They were of various sizes, the smallest measuring 12½ in. in circumference. They were of great weight, weighing from 3 to 4 cwt. Mr. Gibson (Hexham) suggested that the balls were cannon balls. Mr. Heslop did not think so, as many of them were too rough to be used in ordnance.—It was decided, on the recommendation of the Council, to hold day meetings at Bamborough, Staindrop, and Raby and a half-day meeting at Finchale during the summer. It was also agreed that the Society should take over the work of the Northumberland Excavation Committee, at the latter's request. Mr. Richard Welford read a paper, by Professor Terry, on the visits to Newcastle of Charles I. in 1633, 1639, and 1641. Dr. Hodgkin then read a short paper, by Mr. John Ventress, entitled "Notes on Merchants' Marks in the Church of St. Nicholas, Newcastle."

DURHAM AND NORTHUMBERLAND ARCHÆOLOGICAL AND ARCHITECTURAL SOCIETY.—The annual meeting of the Archaeological and Architectural Society of Durham and Northumberland was held on the 27th ult. in Bishop Cosin's Library, Palace Green, Durham. The President (the Rev. Wm. Greenwell) presided. The Treasurer (Mr. J. G. Gradon) presented the statement of accounts for 1897, which showed a credit balance of 154l. 10s. 11d. During the proceedings the places were selected for the outdoor meetings during the ensuing summer, the following being decided upon:—(1) Dunstanbro' Castle and Embleton; (2) Ryton, Newburn, and Heddon-on-the-Wall; (3) South Church, St. Helens, and Escomb; (4) Mount Grace Priory, and (5) two days' meeting, Furness Abbey and Cartmel. The President then delivered an address on the work of the year. In the course of his remarks he congratulated the committee on having published another volume of "The History of North-

umberland." It was said that they could complete the work in twelve quarto volumes, but he thought it would take fourteen volumes to complete it. In conclusion, the President referred to the collection of Roman memorial crosses in the Chapter Library. It had, he said, been brought together during the past thirty years, and formed a large and valuable collection of sculptured work of the pre-Conquest period.

Correspondence.

To the Editor of THE BUILDER.

WALTHAM ABBEY.

SIR,—Will you allow me to point out a few facts connected with Waltham Abbey, in answer to the letter from Mr. Francis Bond which you published last week?

It must be conceded at once that, by whomsoever the building as we find it was erected, it is what we know as a Norman design.

It is also perfectly evident, although Mr. Bond does not allude to the fact, that there is Norman work of three distinct dates in the building—the five western bays on each side of the nave being of one date, the two eastern bays on each side being of another date, and the western portion of the north clearstory being of a third date, the last of these three being manifestly the latest Norman work in the building.

With regard to the dates of the two remaining portions opinions have differed. Mr. Parker, I believe, following Professor Willis's theory that thick jointing denotes early work and thin jointing late work, thought that the eastern bays were the earlier, while Mr. W. Burges and Mr. E. A. Freeman, recognising by the style of the eastern bays that they could not have been rebuilt much later than 1100, and arguing that it is almost impossible to believe that either William the Conqueror or William Rufus would have taken the trouble entirely to rebuild Harold's Abbey, came to the conclusion that the western bays, as they stand, must form part of the building actually erected by him.

In 1875 I made careful ¼-in. scale drawings for Mr. Burges, showing every stone of the two bays between which the junction of dates takes place, and I believe I may venture to say that, as far as Mr. Burges was concerned, he considered that these drawings brought out conclusive evidence, derived from the building itself, that the views which he and Mr. Freeman had always held were correct. Allow me to put this evidence before your readers as shortly as possible.

A very serious settlement took place at some period in connexion with the second pier from the east end on the south side of the nave; this pier has, in fact, sunk bodily some 10 in. into the ground. But the strange fact is that, whereas all the arches which rest upon it on the western side are badly crippled, those on the eastern side have been carefully built as they stand; that is to say, they spring from a higher level on the eastern side than they do on the western, and a considerable amount of ingenuity has been displayed throughout this second bay from the east end, in order to adapt the whole of the reconstructed work to the two levels.

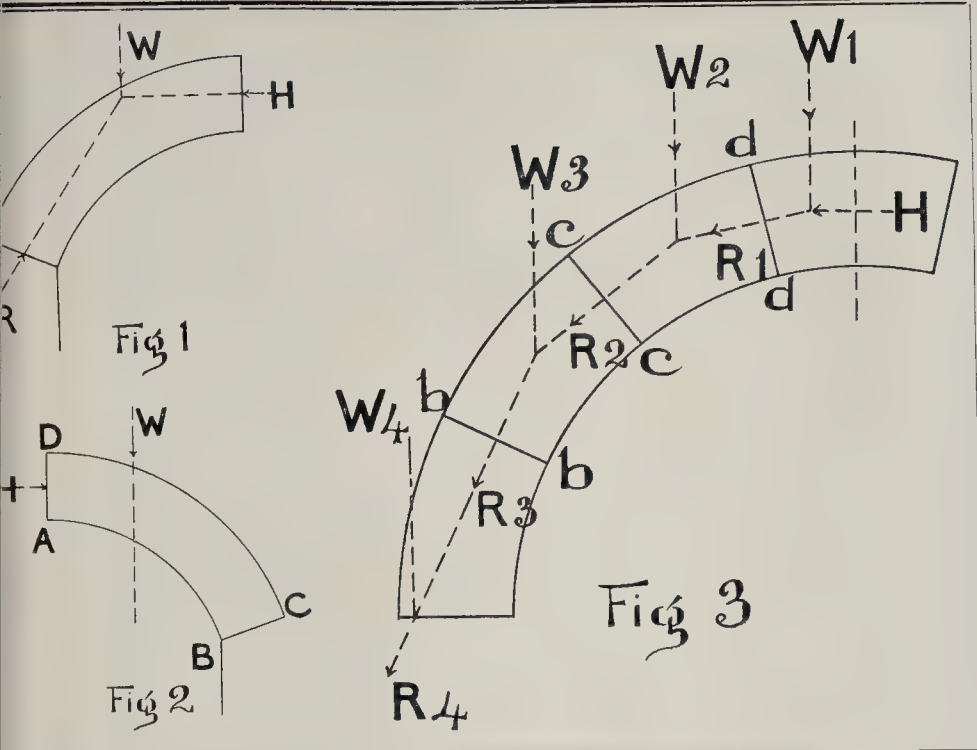
From this it seems clearly to follow that the third bay from the east end must have been built before the great settlement took place, and, similarly, that the second bay from the east end must have been rebuilt afterwards.

The remainder of the western part of the church is obviously of the same date as this third bay from the east end, while the easternmost bay is as clearly of the same date as the second bay.

The architecture itself also proves that the eastern bays are later than the western because, whereas in the western bays no fully-developed running mouldings occur, these eastern bays are assuming mouldings of the most distinct character, viz., in the arch at the east end of the south aisle, this arch clearly belongs to the same date as the two easternmost bays of the nave, as can be proved by a careful study of the jointing of the lower part of the great south-western pier of the crossing, and by a comparison of the cap and base mouldings of the piers of this arch, and of the eastern respond of the nave arcade. The blocked Norman window of the easternmost bay of the south aisle also possesses running mouldings of a well-developed character.

It can hardly be doubted that this reconstruction of a part of the nave took place under Henry I., who is known to have carried out large works in connexion with the choir. It follows, therefore, that unless the Abbey church was entirely rebuilt either by William the Conqueror or by William Rufus, the western part of the building, as far as it agrees with the third bay from the east end, must be the work of Harold.

That Harold should have erected a building of this description is, I readily admit, most remarkable; it is one more proof of the greatness of the man, but I cannot see that it was impossible for him to have done it; there is nothing distinctly late in any portion of the Norman work of the western part of



church, except in the northern clearstory and in the north door, both of which represent alterations; seems to me simply to denote that Harold had been much impressed with the buildings which he saw in Normandy, and that, being a wealthy and ambitious man, he brought men over to England from the Continent to carry out his new works at Waltham Abbey.

The argument which is so often brought forward, viz.: that the buildings erected by the early Normans in England are of a ruder character than Waltham Abbey, is not conclusive, because for the last twenty or thirty years the Normans must have thought much more about establishing their authority in the conquered country than about the production of good ecclesiastical architecture, and think the Abbaye aux Hommes at Caen is a standing proof of the fact that Norman architecture was more developed in Normandy before the Conquest of England than it was in England after the conquest.

With regard to the alterations to the nave of Waltham Abbey, which were taken in hand in the fourteenth century, of which I have made no mention above, there is little to be said except that they are very bad; but I should add that, while arguing with Mr. Bond that the aisles were originally vaulted, I am inclined to think that all the vaulting was taken down by Henry I., because in his two letters I cannot find any evidence that vaulting ever existed; probably the early vaulting had become dangerous by reason of the settlement described above, and the whole of it was removed as a measure of safety.

J. ARTHUR REEVE.

THE ARCHITECTURAL ASSOCIATION SOIRÉE.—The annual members' night of the Architectural Association took the form this year, as previously announced, of a smoking concert, and, as we expected, proved exceedingly attractive, the room being crowded with smokers and well filled with smoke, and the entertainment included a great deal that was very amusing. Perhaps the most humorous performance was the recitation of a parody on a sensation novel, "seven spasms," exceedingly well done by Mr. L. Ebsworth. All appeared to be enjoying themselves very much, and probably the smoking concert will henceforth be an annual event.

SALE OF A BUILDING ESTATE, STREATHAM.—At the Mart, Tokenhouse-yard, on the 12th inst., a freehold estate, extending to nearly fifty acres, is to be sold. It is situated between Streatham High Road, and the High Street of Streatham, and Tooting Common, and has frontages to Streatham High-road, Tooting Bec-road, Garrads-road, and Mount Ephraim lane. There are seven family residences on the estate.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XIX.

WE have seen that the position of the curve of pressure and the magnitude of the pressure are of very vital importance as affecting the stability of an arch. It is clearly, therefore, desirable to determine the direction of the curve and the amount of pressure at various points in the curve. If we consider the half section of an arch, as in fig. 1, we see that the arch and its load are kept in equilibrium by three forces—the weight of the arch and its load W acting vertically downwards through the centre of gravity, the horizontal pressure H of the other half of the arch and its load, and the resistance R of the abutment or support of the arch. Of these three forces at present we have not sufficient information. We know or can find the magnitude, direction, and point of application of W ; we know the direction of H , but not its magnitude or its precise point of application; whilst of R we know nothing except that it is one of the three forces keeping the arch in equilibrium, and, therefore, is equal in magnitude and opposite in direction to the resultant of the other two.

As it is not very easy to determine what we want to know about H in order to find R , and still less to determine R in order to find H , it is a common practice in working out graphically the curve of resistance to assume that H is equal to the load on the other half of the arch, and acts at the middle point of the vertical joint. This assumption, however, is very far removed from accuracy. If we suppose that the arch is a perfectly rigid body, we should then have, as in fig. 2, the solid $A B C D$ tending to turn about the point B , the force tending to produce motion downwards of this solid body being the weight of the arch and its load acting through their centre of gravity. It is, therefore, kept in equilibrium by H acting horizontally, and for the purposes of making a start, it may be assumed that H acts at the middle of the joint $A D$; then taking moments about B , and calling h the vertical distance from B in the direction of H , we the perpen-

dicular distance from B to the direction of W , we should have

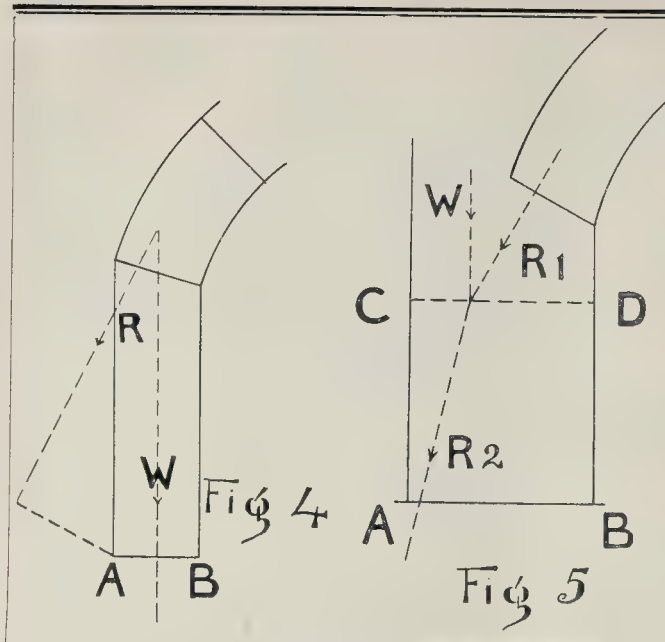
$$Hh - Ww = 0 \text{ and}$$

$$H = \frac{Ww}{h}.$$

If the point of application of H , instead of being as we have assumed at the middle of the joint $A D$, is below, h would, of course, become less. If, on the other hand, the point of application of H is above the point we have assumed, h will be greater, and from the value we have found of H , it is obvious that as h is greater, the value of H is less; and as h is less the value of H is greater. The permissible range of variation in the position of H , in order that the curve of pressure may start within the limit we have assumed, is one half the depth of the voussoir; that is, H may be one quarter of the depth of the voussoir from either the extrados or intrados. The true point of application of the force H is therefore between its greatest extremes of variation, and is that which gives the smallest value to h consistent with the curve of pressure being within the middle half of the arch; it is therefore a common practice, and sufficiently accurate, to take the point of application of H as being on the centre of the vertical line through the crown of the arch. Taking this, therefore, as our point of departure, we have as in the expression at which we arrived above

the value of $H = \frac{Ww}{h}$, and the magnitude,

direction, and point of application of H are therefore known. Those of W , we have already said, are also known, and from these data we can start to calculate graphically the curve of pressure within the arch. Let us suppose that our arch, as in fig. 3, is divided into a number of voussoirs, we will then proceed to find the curve of pressure geometrically, on one side of our arch. We will call our joints aa , bb , cc , and dd , as in the diagram. Taking first the load upon the half of the top voussoir or keystone, we have W_1 acting downwards meeting the force H . By the triangle or parallelogram of forces, we find the direction and magnitude of their resultant, R_1 , and draw this through the joint dd ; this then proceeds until it meets the direction of W_2 , the load on the voussoir cc , dd ;



the resultant of this is R_2 , which proceeds until it meets the direction of the load W_3 ; their resultant, R_3 , passes through the joint bb until it meets the direction of the load W_4 ; and their resultant passes through the joint aa and gives the direction and magnitude of the thrust of the arch upon the abutment.

For the sake of simplicity of illustration, we have divided our arch in fig. 3 into a small number of voussoirs compared to the size of the arch. Our continued line, therefore, made up of the directions of R_1, R_2, R_3, R_4 does not approximate very closely to a curve, but if we had taken a large number of voussoirs the lines would approximate more closely to a curve, and the larger the number of voussoirs the closer the approximation. In this way, therefore, we find graphically the curve of pressure on the initial assumption that H is acting at the centre of the vertical line through the crown or apex of the arch.

The stability of the abutment and its efficiency to resist overturning by the thrust of the arch can be very easily found.

It is clear that the direction of R_4 may pass either within or without the abutment, and also that it may pass either above or below the centre of gravity of the abutment and its load.

Let us suppose, in the first place, that our arch simply stands upon a support without a superincumbent load, as in the case of fig. 4. We should then have two forces concerned in the overturning or stability of the support, viz., the pressure or thrust of the arch, marked R in the fig. 4, and the weight of the support acting vertically downwards through the centre of gravity, marked W . Then, if AB represents the foot of the supporting pier, we should take the moments about the point A ; and when the pier is just on the point of being overturned, R multiplied by its perpendicular distance from A would equal W multiplied by its perpendicular distance from A . If the moment of R about A were greater than the moment of W about A , the pier would be overturned by the thrust of the arch; but if the moment of W were the greater, the pier and the arch would be in stable equilibrium.

Next, let us suppose that the abutting pier has a superincumbent weight as shown in fig. 5; here R_1 represents the thrust of the arch, W the load vertically downwards of the superincumbent weight on the pier or abutment; and R_2 the resultant of these two forces. If R_2 is within AB , the abutment is sufficient to resist the thrust of the arch. If, on the other hand, R_2 passed without the pier, above the line AB , we should then have to consider whether the weight of the abutment beneath the point where the directions of W and R_1 meet is

sufficient to prevent the overturning by R_2 . This would be a case similar to that in fig. 4, and to arrive at our conclusion we should, as before, take the moments about A of R_2 , and the weight of the lower portion of the abutting pier; the portion, that is, of the pier below the point where W and R_1 meet, as indicated by dotted line $C-D$.

In our consideration of the strength of the abutment, we have assumed that for the purposes of calculation the pier may be regarded as a homogeneous solid. And since piers are not usually built homogeneous, it is necessary to allow some margin of safety to compensate for the deficiency of the pier in this respect, as it may be liable to failure by some course of the masonry or brickwork being overturned about its edge; this would, however, seldom occur, as long as the amount of pressure were within the usual limits allowed in brickwork and masonry of the crushing strength of the material.

OBITUARY.

MR. PHILIP CALDERON, R.A.—Mr. Philip Hermogenes Calderon, whose death has just taken place, was born at Poitiers, in 1833, and studied art both in London and Paris. He first exhibited at the Royal Academy in 1852, was elected an Associate in 1864, and an Academician in 1867. In this year he exhibited at the Paris International Exposition, and obtained the first medal awarded in Paris for English art. A year later in Paris he received a gold medal and the knighthood of the Legion of Honour. Mr. Calderon was elected Keeper of the Royal Academy in 1887, and he died after a long illness, at his official residence, Burlington House. The funeral took place on Wednesday.

MR. W. S. CROOTE.—At Heavitree, Exeter, on the 27th ult., the funeral took place of Mr. W. S. Croote, architect, of Exeter, who died on the 24th ult., at the age of forty-four. The deceased was formerly surveyor to the Freehold Land Society, a position he resigned a few months ago in consequence of failing health. He was also hon. architect for the Horse Show Society.

SCAFFOLD ACCIDENT, WESTMINSTER.—On the 20th ult. a scaffold accident occurred in Monk-street, Great Peter-street, Westminster, whereby two men sustained serious injuries. Some building alterations were in progress in Monk-street, and two men were at work upon a platform some 40 ft. from the ground. The other employees heard a cry, and saw that the planking upon which the men had been standing had given way, or become shifted, with the result that the men had fallen to the ground. They were picked up, both in an insensible condition. The injured men were removed on the ambulance to the Westminster Hospital, where it was found both had sustained serious injuries, and they were detained.

GENERAL BUILDING NEWS.

RESTORATION OF BLEASDALE CHURCH, LANCA- SHIRE.—The ancient church of St. Eadmor, at Ap- marsh-in-Bleasdale, has just been opened after restoration. Mr. J. A. Seward, of Preston, was the architect, and Mr. Betham, also of Preston, has been the contractor. A new chancel has been added. Local stone was used in conjunction with Longridge dressings. The roof is formed of grey slates, and the floor is tiled. The main building has also been re-covered with grey slates, and the whole of the old pews removed and substituted by unvarnished pitch pine. Additional sitting accommodation has been provided, and stained glass windows inserted in the walls.

CHURCH RESTORATION, ASHILL, NORFOLK.—The timbers and stonework of the church tower have become very much decayed with age, and it has been decided to put the tower in a state of repair. The plans are by Messrs. Milne & Hall, architects, London. At the completion of the work to the tower the bells are to be rehung. The work is being carried out by Messrs. Waters & Son, builders, Walton.

PARISH CHURCH, LOCKERBIE, N.B.—The new Parish Church at Lockerbie was opened on the 22nd ult. The new building is of red freestone. A square tower rises to a height of 65 ft., and a miniature octagonal spire of stone rises to a further height of 30 ft. Sitting accommodation is provided for about 800 people, and the total cost was about 5,000l. The architect was Mr. F. J. C. Carruthers, Dumfries.

NEW CHURCH, DERBY.—The Bishop of Southwell, consecrated on the 25th ult. the new Church of St. Augustine, which is situated in the suburb of New- morton, Derby. The style is Early English, and the plans have been prepared by Messrs. Naylor & Sale, of Derby. The structure is built of red brick, with Coxbech stone dressings, and when completed will consist of two naves, two aisles, vestry, organ chamber, and chancel, but at present only the nave and north aisle have been erected. The cost of the present contract is 3,600l. The building is heated by low-pressure hot-water apparatus. The seats and fittings are of pitch pine and red deal, varnished.

COMPLETION OF ST. LUKE'S CHURCH, ROCHE- DALE.—On the 23rd ult. Archdeacon Wilson dedicated the Church of St. Luke's, Rochdale, which has just been completed. The portion now erected, at a cost of 4,000l., completing the church, consists of a nave, side aisles, etc., to be used as a passage only, and a baptistry at the west end. The principal entrance is through a porch on the south side, while another entrance is provided on the north. The aisles and baptistry are divided from the nave by an arcade, the baptistry floor being raised above the nave level. Externally and internally the church is faced with small pressed bricks, relieved with red Rainhill stone dressings. The roofs are covered with north country green slates, and the windows are filled with tinted cathedral glass in geometrical designs. The internal woodwork is of selected pitch pine, and the floors of the aisles and baptistry are tiled. The style is Early English, and the building provides accommodation for 474 worshippers. The works have been carried out from the designs, and under the supervision of Mr. R. Knill Freeman, of Bolton and Manchester, the architect for the formerly erected portion. The contractors for the work have been Messrs. Enderley & Match, of Rochdale.

ALTERATIONS TO LEEWOOD CHURCH, BER- WICK.—Alterations to this church have just been carried out from plans prepared by Messrs. Hardy & Wight, architects, Edinburgh.

RESTORATION OF BROMYARD CHURCH, HEREF- ORDSHIRE.—On the 28th ult. the reopening, after partial restoration, of the Parish Church of Brom- yard took place. The work done includes the build- ing of new parapets and battlements to the tower and turret, the renewal of the exterior of the roofs of the nave and aisles, also that of the tower, the restoration of the north transept, and the erection of nine new buttresses on the north and west sides, together with a new gable coping at the west front of the edifice. Improvements have also been made to the interior of the chancel, including the provision of a stained wood ceiling, and the laying of a floor of ornamental tiles. The architects were Messrs. Nicholson & Hartee, of Hereford.

CONSECRATION OF CHANCEL, ST. PETER'S, ARKLEY, MIDDLESEX.—The new chancel at St. Peter's Church, Arkley, has just been consecrated by the Bishop of St. Albans. It has been erected from designs by Mr. J. C. Traylen, of Stamford (architect and surveyor for the dioceses of Peter- borough and Lincoln). The style is Early English. The floor is of stone with marble in the sacrum. The chancel is 31 ft. by 17 ft., and the height 27 ft. to the ridge of the gabling; and the vestry is 20 ft. by 10 ft. 9 in. The chancel is lighted by four three- light pendants. Additional seating accommodation for nearly one hundred people is provided by means of a south transept and the additional length added to the church. The work has been carried out by Mr. Wade, of St. Neots.

CATHOLIC CHURCH, THORNTON, LANCASHIRE.—The foundation stone has just been laid of a new Catholic church at Thornton. The structure will be Gothic in style, and will have accommodation for about 500 worshippers. It measures 114 ft. in length and 60 ft. in width. A tower, some 80 ft. in

height, will be erected. The building is faced with Yorkshire parpents and red stone dressings. The windows will be mullioned and traciced and filled with cathedral glass, the main east window being circular in shape and filled with quatre-foils lights. The work is being carried out by Mr. J. Kirkbride, of Fleetwood, and the architects are Messrs. Pugin & Pugin, of London.

PRIMITIVE METHODIST CHURCH, CHESTER.—The memorial stone has just been laid in Hunter-street, Chester, of a new Primitive Methodist church. The building will be of red Ruabon bricks with buff terra-cotta dressings. The site of the building is given as 570, and the vestries afford accommodation for 60 more. Mr. Thos. Howdill and Mr. Chas. B. Howdill, of Leeds, are the architects, while the whole of the building contract has been let to Mr. Wm. Vernon, of Chester.

WESLEYAN CHURCH, CHESTERFIELD.—The Wesleyan Methodists of Chesterfield are building a mission church, which will serve the population of Spital. The building will be two stories high, and accommodation will be provided for 350 scholars at the Sunday school. There will be six classrooms on the ground floor, and over these will be a classroom. In the front of the building there will be a large hall with cathedral glass. Mr. Willis of Derby, is the architect, and the entire cost will be about 1,500.

BIBLE CHRISTIAN CHURCH, CARDIFF.—The memorial stones of a new edifice were laid on the 27th ult. in Cowbridge-road, Cardiff, under the auspices of the local branch of the Bible Christian Church. The building will cost 4,200, and the new church—adjoining which there will be a school-room—will give accommodation to some 600 people. It will be 41 ft. 6 in. wide and 62 ft. in length. The structure will also include a library, kitchen, church-parlour, organ-chamber, and minister's vestry, and will be heated by hot-water apparatus. The architects are Messrs. Knox & Wells.

SCHOOLS, PENZANCE.—The new schools in connexion with St. Mary's Church, Penzance, which have been built on land at the western end of the Promenade, were opened recently. The schools will accommodate 630 children. They have been planned on the classical plan. The building consists of three wings, the eastern one comprising four girls' class-rooms, cloak-rooms, and lavatory. The central wing comprises the central hall, in which all the children will assemble each morning prior to being dismissed to their respective classes. There are also two boys' class-rooms: these three rooms can be thrown into one room. The western wing comprises three boys' class-rooms, manager's room, cloak-rooms, and lavatories. In the rear of the respective departments are the lavatories, &c. There are playgrounds for boys and girls, each having its central shed for use in wet weather. The various contracts have been entrusted to the following:—Masonry, Mr. Edwards; Paving, carpentry and joinery, Mr. Thomas James; plumbing, Messrs. T. H. Stewart & Sons, under the direction of Mr. Harold Stewart; smithwork, &c., Messrs. Holman; painting and glazing, Messrs. Colenso & Son; and the whole of the work has been carried out from the designs and under the personal superintendence of Mr. Oliver Caldwell.

NEW SCHOOL, SANDFORD.—A new Board school has been erected in Sandford-village, in the Jesmond district, Newcastle. The buildings afford accommodation for 1,500 children, divided into seniors, juniors, and infants, the seniors and juniors (1,080) being arranged in a two-storied building, and the infants (480) in a one-storied building. The mixed school is situated on the north side of the site, and the infants' school on the east side. The playgrounds occupy the remainder of the space. The boys' entrance in the mixed school, for both seniors and juniors, is at the west end, and that for the girls at the east end; the juniors passing by a door into the ground-floor, and the seniors by another door to the upper floor. The ground-floor comprises eight class-rooms, arranged near to a central hall or larger class-room 40 ft. by 32 ft. 6 in., into which two of the class-rooms, 25 ft. by 24 ft., open by means of a folding partition, the rooms together forming a large hall for assembling the scholars, or for public use. The six other class-rooms, three on each side, are visible from the central hall. The upper floor of the mixed school is similar in plan to that below. The large hall is, however, higher, being open to the roof. It has hammer-beam principals, and exposed roof timbers. Cloak-rooms, lavatories, and teachers' room are placed near to the entrances previously mentioned. The infant school in its plan is somewhat similar to the mixed school, a large school-room and six class-rooms, three on each side, fitted with small galleries, &c., for the accommodation of young children. Mistress's and teachers' rooms and the usual cloak-rooms and lavatories are provided. In the roof of this block a cooking-room, scullery, and stores replete with ranges, stoves, sinks, &c., have been contrived and will be used as a cooking centre. There is also a spare room, which may be used for recreation purposes in bad weather. A caretaker's house of four rooms with scullery and bath-room is placed at the corner of Starbeck-avenue and Doncaster-road, and commands the girls' and infants' entrance gates and the playgrounds. The latter contain

covered sheds and offices, and the pavement is covered with asphalt. The whole of the school-rooms are divided from the corridors by glazed partitions. A glazed brick dado surrounds the various rooms, and the floors are of solid wood blocks. The warming is by steam, and the ventilation by mechanical means. The walls are of red brick and stone, and the roofs covered with green Westmorland slates. The red facing bricks used are from the Union Cement Company's Atlas Brickworks at Wallaseid. The glazed bricks have been supplied by Messrs. Carr & Sons, of North Shields. The works have been carried out from the designs and under the supervision of the architects, Messrs. Armstrong & Knowles, Newcastle. Mr. W. J. Walker being the clerk of works, Mr. Joseph Elliot, of Newcastle and North Shields, the contractor for the general works, and Messrs. Walker & Son for the heating apparatus.

SUNDAY SCHOOL, LEAMINGTON.—The stones of a new Sunday school in connexion with Ventnor-street Methodist New Connexion Chapel, Kirkstall-road, were laid on the 23rd ult. Mr. W. S. Braithwaite is the architect of the building. There are two stories. The ground floor will be used as an assembly room; the upper floor will provide a preaching-room and a school-room.

SUNDAY SCHOOL, PUDSEY.—Ten memorial-stones of a new Sunday school connected with the Mount Zion Methodist New Connexion Church at Fartown, Pudsey, were laid on the 23rd ult. The schools are being erected from designs prepared by Mr. H. Hodgson, architect, of Bradford and Pudsey, and will be in the English Georgian style. There will be a school-room measuring 66 ft. by 35 ft. and ten class-rooms—five on each side—each 11 ft. by 10 ft. 6 in., with a large infants' room and class-room, and a kitchen at the east end. Two store-rooms and a heating-chamber will be provided in the basement. The school-room will have a platform at the east end, and will be lighted from both ends and by side lights over the class-rooms. It will have an open timbered roof, and will accommodate about 600 children. It will be built of stone, and will be heated by hot water on the low-pressure system. The various works will be carried out principally by local contractors, and the total outlay is estimated at 2,000.

SUNDAY SCHOOLS, OLD HILL, BIRMINGHAM.—On the 25th ult., the new Victoria Sunday Schools, erected in connection with the Tabernacle Chapel, were opened. The schools have been erected by Messrs. H. Dorset & Son, of Cradley Heath, from designs by Mr. A. Ramsell, architect, of Dudley, at a cost of 2,000.

THEATRE, PERTH.—A new theatre is to be erected at Perth. The site selected for the new building is situated opposite the new Post Office, between Mill-street on the north, High-street on the south, and Cutlog Vennel on the west. The principal entrance will be from High-street. The architect is Mr. William Alexander, Dundee.

FREE LUNACY HOSPITAL, LINCOLNSHIRE.—The Free Lunacy Committee at Boston have instructed Mr. Rowell, architect, to prepare a plan for the conversion of the present poultry market and the room occupied by the keeper of the assembly rooms into a building for the purposes of a reading-room and library, and also for the erection of rooms for the keeper over the fish market.

PUBLIC BATHS, & PLAISTOW, ESSEX.—A Local Government Board inquiry was held at Stratford recently respecting the application of the Town Council for sanction to borrow 2,841l. for lighting the public buildings by electricity, 5,955l. for the purchase of land at Plaistow for highway purposes, 5,109l. for street improvements, and 10,000l. for the erection of public baths at Plaistow. Mr. Steinitz, electrical engineer, explained that the sum required for the lighting of public buildings by electricity included the Town-hall (777 lights), at a cost of 1,800l., forty-five lights in the police-court, 101 in the stables and stable-yard, thirty-two in the fire station, mortuary, and other offices at Canning Town, 5,955l. for the purchase of land at Plaistow to provide a gravel pit, the present pit being nearly worked out. The land was six acres in extent. In regard to the public baths for Plaistow, Mr. Saxon Snell, architect, explained the construction of the baths, which are to comprise two swimming baths, with slinger baths at the sides.

NEW WING, MAGDALEN HOME, BALLYNAFEIGH, BELFAST.—The foundation stone of a new wing in connexion with the Magdalen Home, Ballynafeigh, was laid on the 24th ult. The new wing will comprise a three-story building, 75 ft. long by 32 ft. wide, giving an additional dormitory and refectory in connexion with the Home, and a new packing-room and receiving-room for the laundry. The contractor is Mr. J. Fegan, and the architect is Mr. W. H. Byrne.

WORKSHOPS, NEAR ABERDEEN.—The finishing mill at Stoneywood Paper Works is to be rebuilt according to plans prepared by Messrs. Jenkins & Marr, architects, Aberdeen. The structure will be almost entirely of steel and glass, and the contract for the steel work has fallen to Messrs. W. McKinnon & Co., ironfounders, Aberdeen. The building will be in alternate sections of one story and four stories high, so as to give suitable light for the process. The mill will have a total length of 200 ft., and the breadth will be 300 ft.—Contracts

have been accepted for the erection at Inverarie of locomotive and other workshops for the Great North Railway system. The present contracts include carriage and wagon-shop, paint-shop, smithy and foundries, and boiler-fitting and erecting shops. The designs are by various officials of the company, and the contractors are:—Mason-work: Pringle & Slessor, Aberdeen; slater-work: G. Davidson, Aberdeen; plumber-work: J. Blaikie & Son, Aberdeen; carpenter: Mr. Buchan, Monymusk, Aberdeenshire; painter-work: J. Garvie & Sons, Aberdeen; steel and iron: A. Findlay & Co., Motherwell, Lanarkshire.

PUBLIC BATHS, WOLVERHAMPTON.—The front elevation of this building, which is now being erected, is to be faced with Kingswinford bricks, with terra-cotta dressings of a buff colour. Circular windows are to be formed in each gable. The back and sides of the buildings will be faced with picked common bricks, with arches over the door and window openings in Kingswinford pressed bricks. The interior of the building will be finished in coloured, enamelled, and plain red and buff bricks. The pond will be 8 ft. in length by 31 ft. in width, constructed of common brickwork in cement, and cement concrete foundation to floor. The walls and floor of the bath are to be covered with enamelled bricks. A scum channel will be fixed a little above the water level; this scum channel also forms a hand-rail. The tops of the walls of the pond are to be finished with a white Sicilian marble coping, and the floor of the promenade with small vitreous-coloured tiles laid in cement on a bed of concrete: 6 ft. 6 in. water depth is provided at diving end, and 3 ft. 6 in. at the shallow end. The dressing boxes will be removable, so as to give a clear space when the building is desired to be used for other purposes, such as assemblies, &c. A gallery is to be constructed along the two sides and end of the building. The roof is to be formed of wrought-iron trusses, and for a space of 8 ft. measured on each side of the ridge will be glazed with rough plate glass. Two staircases are provided for access to the gallery from the ground floor, and an emergency stair is fixed externally at the west end of the building. The building will be provided with a removable close-boarded floor, laid in narrow widths, so that in the winter the assemblies can be held. The principal contractors are Messrs. Wilcock & Co., Wolverhampton, and the Ruabon Terra-cotta Company. The building is being erected from the design and under the supervision of the Borough Engineer and Surveyor (Mr. J. W. Bradley).

CENTRAL HALL, REDCAR.—At a recent meeting of the Kirkcaldy Urban Council the plans of the new Central Hall for Redcar were considered. The site chosen is that now occupied by the present Central Hall and other buildings, and is bounded on the south by Queen-street, on the east by West-terrace, and on the north by Central-terrace, and on the west by Walker-street. Provision is made on the ground floor for an exhibition and concert-hall, 107 ft. long by 49 ft. in width, having at the Walker-street end a stage 93 ft. 3 in. across, with a depth of 28 ft. 6 in. from footlights to rear. There is an orchestra in front of the stage, and provision is made at the rear for gentlemen's dressing-rooms, ladies' cloak-rooms, and other apartments. Facing Queen-street there are to be eight shops on the ground floor, while other four will front into West-terrace. The main entrance to the hall is from Queen-street. Around three sides of the hall runs a balcony, backed on the Queen-street side by committee-rooms, dining-rooms, kitchen, caretaker's living-rooms, &c., which are situated above the shops. On the first floor there is also a smaller concert and lecture-room, provided with a small stage and with ladies' and gentlemen's dressing-rooms, having an entrance from West-terrace. It is estimated that the main hall will seat 1,500 people exclusive of the balcony accommodation, and the concert-hall, facing into West-terrace, 300 people on the floor and 100 in the gallery. The whole of the buildings will be lit up with the electric light and heated by water, special cellars for the engines and boilers being provided underneath the dressing-rooms and corridor behind the stage in the main building, with entrance from the street. Mr. Robert Moore, of Middlesbrough and Redcar, is architect for the scheme. The plans were approved subject to a footpath on one side being not less than 7 ft. wide.

THE NEW LIBRARY FOR BIRMINGHAM.—On the 20th ult. the committee of the Birmingham Library Association met, and the committee decided to open the tenders for the new building which is to be erected at the corner of Margaret-street and Cornwall-street. The tender accepted is that of Messrs. John Barnsley & Sons, and the building is to be completed in eleven months. The designs, by Messrs. Cossins, Peacock, & Bewlay, provide for a building of two stories, with an extra floor in the roof in the rear portion. The principal frontage, which will be in Margaret-street, will have a length of 81 ft., while along Cornwall-street the library will extend 87 ft. The Margaret-street front will be broken up into three sections, that at each end being gabled, while the middle section will be slightly recessed. The Cornwall-street frontage will be treated in a similar way. Each of the projecting portions of the frontage will be faced up to the first floor with white Hollington stone. The remainder of each facade will be made up of

bright red Ruabon facing bricks, with bands of white Hollington stone, the latter also being used for the other ornamental features. The portico and lobby will be faced with stone. Swing doors will give access to a hall, 23 ft. by 27 ft. Facing the entrance will be a counter shutting off the book distributing department. This will be in immediate communication with the clerks' office and the librarian's room and a committee room, these apartments occupying the whole of the Cornwall-street front. The entrance lobby will be on the right of the portico, and a little window on the left will light the telephone room. Immediately adjoining the hall and in direct communication with it and with the librarian's department will be the lending library, 54 ft. by 35 ft. This will occupy the rest of the Margaret-street front, and will contain adjustable shelving for some 25,000 volumes. The library will be laid with wood blocks, and the entrance hall with mosaic pavement. A stone staircase will lead to the upper floors. The principal room on the first floor will be the general reading-room. This will extend over the lending library and the entrance hall, and will be divided into corresponding portions by sliding-doors, so that on special occasions the whole may be used as an assembly-room. The reading-room will receive light not only from the large windows, but, by ceiling lights, from the partially-glazed roof. Adjoining the reading-room will be a small room for rare books, and the rest of the floor will be taken up with rooms for the proprietors. These will include a smoking-room, 32 ft. by 23 ft., and a lady proprietors' room, each with its own set of lavatories. The second floor, formed in the roof over the proprietors' department, will be devoted entirely to the storage of books. The portion of the basement under the lending-library will contain the books not in current demand, room being provided for 30,000 volumes. The rear portion of the basement will contain a work-repairing room, an assistants' mess-room, the caretaker's rooms, the heating-chamber, and the coal-store. Advantage will be taken of the slope of the ground to provide a yard on a level with the basement, so that the light from the area windows will be largely supplemented.

CONVENT, EDGEWORTHSTOWN, IRELAND.—The foundation stone has just been laid at Edgeworthstown of the Convent of St. Elizabeth. The new convent will be built from the plans of Mr. William Hague. The plan of the ground floor consists of an entrance hall with reception room on one side and a parlour on the other; a community room with the usual culinary appendances, and a corridor; a staircase will lead to the upper story, which will comprise an oratory and the community cells. One wing on the ground floor is to be devoted to the convent chapel. Attached to the residence of the community will be the schools, which will be capable of accommodating over 200 children. The entire cost of the construction of schools and convent will be 3,200l.

CO-OPERATIVE PREMISES, FIRVALE, SHEFFIELD.—A new branch for the Brightside and Carbrook Co-operative Society has just been opened in Overlane, Firvale. The architect was Mr. H. Webster, and the contractor was Mr. G. Torry, except for the plumbing and glazing work, which was executed by Messrs. Mellows & Co.

NEW POST OFFICE, STRANRAER, N.B.—The new building which has been erected for the use of the Post Office in Stranraer was opened recently. It is situated in Charlotte-street. The plans were prepared by Mr. James McLauchlan, jun., and received the approval of the Post Office authorities.

ALTERATIONS, JOHN KNOX PARISH CHURCH, ABERDEEN.—The alterations to this building have just been finished. The contractors for the work were:—Mason work, George Duguid; carpenter, Innes & Sons; plasterer and cement work, Scott & Sellar; plumber, John Worling; painter, Bain. Mr. G. H. Jolly was architect for the alterations.

CITY LUNATIC ASYLUM, NEWCASTLE.—Mr. W. A. Duat, Local Government Board Inspector, held an inquiry at the Town Hall, Newcastle, on the 27th ult., with respect to an application to the Board by the Newcastle City Council for sanction to borrow 2,140l. for public library purposes, and borrow 60,000l. for the extension of the City Lunatic Asylum. Mr. E. C. Sanders, on behalf of the Town Clerk, explained that the sum of 2,140l. was towards the installation of the electric light at the Central Library; getting of book-cases, &c., rendered necessary by alterations, &c. The 60,000l. required was an additional amount over and above that of the sum of 100,000l. which was borrowed on the sanction of the Local Government Board on August 4, 1894. Mr. Dyson, architect, stated that the amount of expenditure which the committee was committed to up to the present was 139,088l. The amount estimated for furnishing the whole of the building was 12,000l., and the balance to make up 100,000l. was 8,012l., which it was proposed to borrow to meet extras and other contingencies which might arise. The superstructure was commenced in July, 1895, of the foundation having been completed the previous Christmas.

NEW HOTEL, EDINBURGH.—The new Royal British Hotel in Princes-street, which has been in course of erection for the past two years, has now been completed. The building has a frontage of 50 ft. to Princes-street, and a depth, from front to back, of over 100 ft.; it is five stories in height above

the street level, exclusive of the attic floor, which will be occupied by the servants. In the basement floor a billiard-room, with four tables, is provided, with adjoining buffet, lavatories, &c.; on this floor also are the cellars. On the street floor is a buffet, restaurant and grill-room, smoking-room, and the hotel entrance hall. On the first floor is a large dining-room, 60 ft. by 35 ft., having two oriel windows to Princes-street. Behind the dining-room, and directly communicating with it, is the kitchen, with its various working apartments. On the upper floors are smaller dining-rooms, drawing-room, private parlours, and forty bedrooms. The work has cost over 15,000l., and the architect is Mr. J. Macintyre Henry, of Edinburgh. The same architect is engaged on alterations and additions to the Royal Hotel, Princes-street, which when completed will cost about 15,000l.

CHURCH TOWER, SS. CATTWG AND ILLTYD, NEATH VALLEY.—The old tower of SS. Cattwg and Illtyd's Church, Neath Valley, Glamorganshire, is about to be restored, under the supervision of Mr. C. E. Fowler, architect, of Cardiff. Mr. Wm. A. James of Cowbridge is the contractor who has been entrusted with the work.

SANITARY AND ENGINEERING NEWS.

MANCHESTER SEWAGE TREATMENT.—The Rivers Committee of the Manchester City Council met on the 28th ult. to decide what sum should be borrowed for treating the city sewage at the new works at the bacterial system. It was agreed to ask the sanction of the Local Government Board to the borrowing of 100,000l. This sum, it is estimated, will be required for 37 acres of bacteria beds and the purchase of the necessary land for aeration purposes.

THE STAINES RESERVOIRS.—On Saturday last Mr. Edmund Boulton, M.P., performed the ceremony of turning the first sod at the commencement of the Staines Reservoir Works. The scheme, which received the sanction of Parliament in 1865, is to draw a larger quantity of water from the Thames than at present and to store it in reservoirs. The companies who are putting this reservoir scheme into effect are the New River, the West Middlesex, and the Grand Junction Companies. Water will be taken from the river near Bell Weir, where sluices are to be constructed, and will be carried by conduits to a pumping station, from which it will be delivered to the reservoirs by five pumping engines through two rivetted steel mains. The reservoir, divided into two, will be one and a quarter mile in length, and have an average width of nearly a mile. From here the water will be conveyed by an aqueduct to the works of the New River Company near Hanworth, and to an additional and smaller reservoir near Kempton Park, from which the West Middlesex and Grand Junction Companies' works will be supplied. The works have been designed by Messrs. Walter Hunter & R. E. Middleton, and are being executed by Messrs. John Aird & Sons. It is estimated that they will be completed in about four years.

SEWERAGE SCHEME, DARTON, YORKSHIRE.—An inquiry has just been held by a Local Government Board's inspector into an application of the Darton Urban District Council to borrow 11,500l. for the purposes of a sewerage scheme for which plans had been prepared by Messrs. Radford, engineers, Nottingham. By the present scheme it is proposed to take the sewage of the town, favouring the drainage of several districts of Darton, Mappellwell, Barugh, Barugh Bridge, Barugh Green, Higham, and Kexborough, on land near Swallow Hill, Mappellwell.

VICTORIA BRIDGE, AYR.—The new bridge which has been built across the river Ayr has just been opened. It will effect a public improvement in the opening of a new roadway, three-quarters of a mile in length, between Dalmeilington and Whitteits Roads. The bridge, which was designed by Mr. John Eaglesham, Burgh Surveyor, is formed of three spans, and has a total length of 220 ft., with a width of 40 ft. between the parapets. Each span has four steel girders of arch form, with a rise of 9 ft. at the centre. The outside girders are covered with ornamental cast-iron. The cost of the bridge, with its approaches and other work, will amount to about 8,000l. Mr. W. Clarke was the contractor.

SEWERAGE SCHEME, ST. ANNES-ON-SEA, LAN-CASHIRE.—On the 28th ult. a Local Government Board inquiry was held at St. Annes-on-the-Sea, by Colonel Albert Smith, into an application by the Urban Council for powers to borrow 7,340l. for severing the north-western part of the district on the boundary of Blackpool. Mr. Fair, of the Clifton estate, said a direct road would be opened out from Blackpool across the volunteer field; the railway companies had taken three acres for a new station at Stoney Hill, between St. Annes and South Shore; large areas of land had been taken, and in one instance plans prepared for property to the value of 6,000l. or 7,000l. Other applications were under consideration. The engineer to the scheme, Mr. Bancroft, C.E., computed that the area proposed to be drained would provide for 4,484 houses, or a population of 20,000.

STREET IMPROVEMENTS, &c., WAKEFIELD.—On the 26th ult. Colonel W. Langton Coke, one of the Local Government Board's inspectors, held an enquiry at the Wakefield Town Hall, with reference to an application by the Wakefield City Council for

sanction to borrow 14,776l. for purposes of street improvement, and 1,224l. for works of sewerage.

LOCAL SEWERS IN LONDON.—The Main Drainage Committee of the London County Council have sanctioned, subject to conditions recommended by the engineer, the construction of local sewers as follows:—Battersea—1,125 ft. and 635 ft. of 12-in. pipe and concrete sewer in Brassell-road and Coltness-road respectively. Camberwell—630 ft. of 12-in. pipe and concrete sewer in Summer-road, East Dulwich-road, Peckham Rye. Fulham—70 ft. and 316 ft. of 12-in. pipe sewer in Fulham-road, by Burlington-road, and Farm-lane respectively. Lewisham—142 ft. and 840 ft. of 12-in. pipe sewer in Loampit-hill, and a new road to be called Undercliff-road, Hilly-fields Park Estate, respectively. Plumstead—630 ft. of 9-in. pipe sewer in Wernbrook-road, Plumstead Common-road. St. Saviour's, Southwark—180 ft. of 18-in., and 565 ft. of 12-in. pipe and concrete sewer in Brunswick-street; and 280 ft. and 250 ft. of 9-in. pipe and concrete sewer in Isabella-street and Jane-street respectively. Wandsworth—520 ft. of 12-in. pipe and concrete sewer in proposed new road between Hydehorpe-road and Grove-road, Streatham; 570 ft. ditto in Blegborough-road, Streatham (in substitution of plan approved on February 17); 760 ft. ditto in Huntley-road; and 890 ft. ditto in Farnell-road and new roads, Avenue Estate, Tooting.

STAINED GLASS AND DECORATION.

WINDOWS, ST. PAUL'S EPISCOPAL CHURCH, EDINBURGH.—On the 24th ult. two memorial windows, which have been placed in St. Paul's Episcopal Church, York-place, Edinburgh—one in the chancel and another in the south aisle—were dedicated. The Dean Montgomery memorial window contains figures of six of the early Scots saints, viz., central figures of St. Columba and St. Adamnan, with figures on either side of St. Ninian, St. Kentigern, St. Ternan, and St. Serf. The other window forms one of the series of side windows, and contains in the three under compartments the subject of "The Annunciation," and in the corresponding upper ones "The Epiphany." The work of both windows was carried out by Messrs. A. Ballantine & Gardiner.

WINDOW, PARISH CHURCH, HOLBEACH.—A memorial window has been placed in the parish church at Holbeach, Lincolnshire, by Miss Rippin, of Spalding, as a memorial to her parents. The window has been designed by Mr. E. M. Smith, of Spalding.

SHRINE, SS. AUGUSTINE AND JOHN'S CHURCH, DUBLIN.—The new shrine which has just been erected at this church was opened on the 26th ult. The work has been carried out from the designs and under the supervision of Mr. G. C. Ashlin, R.H.A., of Dublin. To Mr. Sharpe, of Dublin, was entrusted the erection of the Carrara marble altar. The decoration was carried out by Mr. I. Early, and the screen-work, together with the frame in which the picture is enclosed, was carried out by Messrs. M'Goughlin & Sons. The cost of the work was 2,400l.

FOREIGN.

FRANCE.—M. Constant Moyaux, a Government architect, has been commissioned to carry out the construction of the new Cour des Capucines in Rue Carbone. M. Puech, the sculptor, has just finished the monument in honour of Sainte-Beuve which is shortly to be inaugurated in the garden of the Luxembourg, near the Watteau monument. An interesting exhibition of etchings by M. Bessard, the painter, has been organised at the Goupil Gallery, Boulevard des Capucines. It will be open till the 14th.—There is to be opened shortly at Chantilly a large hospital intended specially for the benefit of jockeys and others connected with stable and horse training work. M. Sanson is the architect.—A new tramway is to be laid in the valley of Chevreuse in the environs of Paris, starting from the Saint-Rémy Station, and traversing the valley of Vaux-de-Cernay, and ending at Rambouillet. It will be a considerable convenience in a neighbourhood much visited by tourists.—The buildings for the future exhibition at Boulogne-sur-Mer are in progress. The central dome is to be decorated with panels executed by M. Bonnet, of Bordeaux. The sculptured decoration of the façade is to be in artificial stone with applied ceramic ornament executed by M. Lagrange, of Bordeaux. The entrance to the Fine Arts building has been entrusted to MM. Weber & Bacharach, of Paris. The exhibition, which is International, and both artistic and industrial, will be opened on the 29th.

—The new Préfecture Hôtel for St. Etienne will shortly be completed. MM. Huguet & Delorme are the architects.—The death is announced of two artists, M. Lemaître, and Georges Michel, both members of the Société Centrale.—We learn also of the death of M. Adolphe Appian, painter, but who was known chiefly by his masterly charcoal drawings. He was a pupil of Corot and of Daubigny. He obtained a medal in the Salon of 1868 and the cross of the Legion of Honour in 1892. He was a fine artist, remarkable for his bold and broad style, and although only twenty-two years of age, had contributed to this year's Salon

good landscape, under the title "Brouillard Octobre."—AUSTRIA.—The "Allgemeine holländisch-österreichische Baugesellschaft" (General Building Company of Holland and Austria), has opened its offices, and will probably be shortly undertaking some large works. A new iron bridge is to be built on the Danube Canal at Vienna, at the proposed site the canal is 50 metres broad.—The price of bricks has fallen in Vienna.—A sum of 10,000 florins has been voted by the authorities at Weikersdorf, near Baden, for the erection of a parish church to commemorate the Imperial Jubilee.—In the new district of Graz, that is, the portion lying between the Graz stream and the southern boundary of the town, a new church is to be built; it is to be dedicated to St. Joseph, patron of Styria. The district has hitherto been very badly provided with church accommodation.—The Municipal Council at Feldbach has purchased a house with garden and business premises for the sum of 11,500 florins, on the site of which the completion of the Rathaus is to be erected.—Dr. von Ruber, Minister of Justice, has communicated with the Mayor of Brünn, relative to the appropriation of a site at present devoted to military purposes for the proposed law court at Brünn.—A new barracks will be erected at Kremser for the reception of two battalions of the 1st and 2nd regiments of the Imperial Austrian Infantry. The work must be finished at latest on June 1, 1899.—The plans for a new theatre of varieties at Buda-Pesth (Herr Julius Schweiger, Révaygasse, architect) have just been submitted for approval.—Herr Julius Ullmann has been selected as architect for the new Stock Exchange buildings to be erected at Buda-Pesth.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. H. T. Hare, architect, has removed from 1, York Buildings, Adelphi, W.C., to 13, Hart-street, Bloomsbury-square, W.C.

ARCHITECTURAL ASSOCIATION.—SCHOOL OF DESIGN AND HANDICRAFT.—The Committee of Visitors met on the 26th ult. to adjudicate upon the drawings which had been made during the past session by the members of the Elementary Class of Design. The work consisted of the preparation of a complete set of drawings for a draper's shop in a first-class London street. A plan, showing the adjoining buildings upon a corner site, was supplied to each student. Since October last, meetings of the class have been held once a month for the criticism by one of the Visitors of the drawings which were submitted in the various stages of completeness, i.e., a sketch general design in ink, scale 1/4 in. scale; a completed sketch design, details of masonry, brickwork, and plasterwork to 1/2 in. scale; details of steel construction; details of internal woodwork fittings to 1/2 in. scale; details of lighting and internal decoration; a completed design including 1/2 in. scale details. In several sets submitted the conditions had been fully carried out, and reflected great credit upon the students, and that in each of the selected designs the shop fronts consisted of an arch treatment, constructional and self-supporting. At the conclusion of the meeting, Mr. E. W. Mountford, on behalf of the committee, briefly explained to the class the reasons that had governed the Visitors in making their awards.

EXHIBITION OF PLUMBERS' WORK, MANCHESTER.—An exhibition of plumbers' work, the result of a prize competition organised by the Council for Manchester and District of the National Registration of Plumbers, was opened on the 25th ult. by Mr. Alderman Hoy, in one of the rooms of the City Art Gallery. From a statement made by Mr. J. W. Hurst, the secretary, it appeared that the scheme for the competition was devised in August, 1894. It remained in abeyance until the beginning of 1897, owing to the fact that the Council had responded to an invitation to organise a section of the Health Exhibition held in Manchester in 1895-6, in connexion with the conference on sanitary progress and reform. In December, 1896, a preliminary exhibition was held in the Royal Technical Institution, Salford, with the view of affording intending competitors some practical information with regard to the work required from them. A deputation from the Council, supported by other bodies, waited upon the Technical Instruction Committee of the Manchester Corporation, and the Committee consented to receive the prize work from the competition, in order that it might form the nucleus of a permanent sanitary museum, and to provide room for it in the new Technical School in Whitworth-street. The Council regretted that they had been able to offer only about 750. in prizes, but it was believed that the quality of the work had not suffered on that account, and as a matter of fact there had been 241 entries in seven classes. The exhibition, therefore, preceded the handing over the prize work to the Technical Instruction Committee. Mr. John Ely, who presided at the opening ceremony, alluded to

the advantages of registration. He was glad to observe that the exhibition afforded proof that under the organisation of the Registration Council the knowledge of the practical details of sanitary work was greatly extended.

NEWCASTLE, GATESHEAD, AND TYNE DISTRICT MASTER BUILDERS' ASSOCIATION.—The annual general meeting of this Association was held at the Royal Exchange Hotel, Grey-street. The President of the Association, Mr. Walter Lowry, occupied the chair. The Secretary (Mr. Wilton A. Rycroft) read a report referring to the business that had been done by the Association during the past year. Mr. D. N. Britts (hon. Treasurer) submitted the accounts for the year, which were unanimously passed. On the motion of Mr. Alex. Pringle, seconded by Mr. Weatheritt, Mr. Walter Lowry was re-elected President for the ensuing year. Mr. Lowry thanked the members for the honour they had again conferred upon him in re-electing him President. During last year, the Association had held a large number of meetings owing to disputes with some of the trades, but taking the year's working on the whole he thought it might be considered very satisfactory. One matter of very great importance to the building trade had been accomplished. He referred to the formation of the Northern Counties' Federation of Master Builders' Employers. The first general meeting of which would be held in a fortnight, when this federation would be in working order. Great success had attended its formation, as the whole of the Master Builders' Associations in Northumberland, Durham, Westmorland, and Cumberland (with the exception of one with whom negotiations were pending) had assented to join. He might mention that federations of a similar nature were being formed in most of the other counties in England, with the intention eventually of all joining together and forming a National Federation of the Building Trade Employers in England. That there were great benefits to be derived from a combination like this it did not require any words of his to explain, but he wished it to be clearly understood that the objects of this Federation were conciliatory to the operatives, and that it would in all cases of dispute with them do its utmost, by arbitration or otherwise, to avoid strikes and lock-outs.—The election of officers was then proceeded with.—The notices for advances in wages received from the Operative Stonemasons and the Carpenters and Joiners' Societies were then considered. In both cases, after considerable discussion, it was decided to make a counter offer of 3d. per hour advance from 9d. to 9½d. in place of the 1d. requested; the offer to the stonemasons to be subject to their reverting to the nine-hours day.

REFUSE DESTROYER, ST. HELENS.—Colonel J. T. Marsh, R.E., an Inspector of the Local Government Board, sat at St. Helens Town Hall on the 28th ult. to hear an application by the Corporation for sanction to borrow 13,000l. for the provision of refuse-destroyer works at the Boundary-road depot. Mr. G. J. C. Broom, Borough Engineer, explained the scheme.

GALASHIELS BUILDERS AND THE WORKMEN'S COMPENSATION ACT.—A meeting of master builders and others connected with the building trade was held at Galashiels on the 22nd ult., to consider the question of forming a local insurance company to meet the claims against employers engaged in the building trades in the Border district for compensation in respect of workmen being injured or killed while in their employment under the Workmen's Compensation Act, 1897, the Employers' Liability Act, 1880, and at common law up to a stated limit, and of covering the expenses of settling these claims. A report was submitted by a committee, who recommended that a company be formed with a capital of 2,000l. in 1,000 shares of 1l. each, and that each share carry with it a guarantee of 10l., each guarantee to be called upon for the purpose of meeting claims for which the premium, income, reserve, and issued capital was insufficient. The uniform rate of premium for insurance for all trades embraced under the term "building trades" was fixed at 25s. per 100l. of wages paid annually, which, it was estimated, would realise 300l. a year in Galashiels. It was understood that this rate was lower than that quoted by existing companies, but it was expected to meet the claims arising from accidents in the district, which, so far as could be ascertained, were comparatively rare. After considerable discussion it was agreed to circulate the Border district, and endeavour to get the co-operation of the trades in the matter, and to hold a further meeting representative of the Border district to finally decide whether to proceed with the formation of a local company or not.—*Scotsman.*

PUBLIC IMPROVEMENTS, MORLEY.—Colonel W. Langton Coke held an inquiry at the Town Hall, Morley, on the 28th ult., with respect to an application by the Town Council to the Local Government Board for sanction to borrow 40,000l. for purposes of street improvements, 2,600l. for the erection of artisans' dwellings, and 400l. for works of sewerage. Plans of the various works were explained by Mr. M. H. Sykes, Borough Surveyor of Stockton-on-Tees, but formerly of Morley, under whose supervision most of the works had been carried out.

BRICK MANUFACTURERS' ASSOCIATION.—The North of England Brick Manufacturers' Association has been formed, and has secured offices in New-

castle. It includes manufacturers in Northumberland and Durham. The objects of the Association are:—(1) To maintain a fair selling price; (2) to combine for the purpose of taking joint action with regard to disputes with workmen, and the proper regulation of wages; and (3) to protect its members in any other manner which may arise. Meetings are to be held monthly.

THE LONDON AND NORTH-WESTERN RAILWAY IN WEST ST. PANCRAS.—The St. Pancras Vestry have addressed a petition to the House of Lords against the Railway Company's Bill, now pending, under which certain lands will be taken for rolling stock. The property scheduled extends over eleven acres, lying along both sides of the railway main line, which runs in a deep cutting between Hampstead-road and Park-street, near Gloucester-gate, Regent's Park. The Company propose to acquire on the south-west side nearly all of Park-village East along the Regent's Canal collateral cut, serpentine-road, and part of Stanhope-street; and on the north-east side the land as far as Mornington-road, with a triangular piece between Stanhope-street and Mornington-place, and other lands adjoining their line and between Delancey-street and Serpentine-road. They propose, also, to stop up all of Augustus-square, Park-village East, and Augustus-street for a length of about 1,350 ft. Serpentine-road (with the bridge over the railway) for about 640 ft., and part of Stanhope-street (including the bridge over the railway) for about 400 ft., thus taking a street area of about 9,000 square yards, in lieu whereof they will make a new road, with an area of only about 7,200 square yards, from the junction of Granby and Stanhope streets to a point 165 yards distant from the north-western end of Park-village East. It is intended, too, to make additional archways or openings under Granby and Harrington streets adjoining the present archways which carry the former over the line. The Vestry represent, and their views are warmly supported by the residents, that by stopping the portions of public street we describe and the bridges over the railway will be a serious severance of the communication, and will cause great public inconvenience, as necessitating a detour of half a mile between points on either side of the railway. They point out, further, that the proposed works involve a temporary stoppage of Granby and Harrington streets whilst the archways or openings are being constructed beneath the former thoroughfare, and the severance and destruction of many important sewers, with the construction of new sewers and connections, and that as the rateable value of the inhabited property is upwards of 8,000l., its acquisition by the company, and the consequent injury to property adjacent, would result in a very considerable loss of rates to the parish, in respect whereof, as well as of the net area absorbed, the company should make compensation.

COVENTRY AND DISTRICT BUILDERS' ASSOCIATION.—A dinner in connection with the Coventry and District Builders' Association took place at the Queen's Hotel recently. Councillor Haywood presided. The Vice-Chairman, Mr. J. Worwood, proposed the toast of the "City Authorities." The Chairman, in replying to the toast, said that some five or six years ago a gentleman was appointed to carry out the new by-laws. Some of the builders thought those by-laws operated rather hard upon them—that they went too far—but eventually they began to see things in a different light. Since then the Council had appointed a Borough Engineer, and the by-laws were put into his hands to carry them out, but some of the builders thought that he had put a wrong construction upon them. Some of the builders lately felt so annoyed—they felt there was a great injustice being done to them—that they passed a resolution stating that they considered representations should be sent to the Council. These were cordially received, and referred to the Engineer to report upon. His report was under the consideration of a sub-committee, who, he had no doubt, would be able to throw a different light upon the matter altogether.—Alderman Bowen proposed the toast of "The Coventry and District Building Trades' Federation," and spoke of the necessity of trade combination.—Mr. W. O. Ivens and Mr. Harper responded. Mr. T. G. Golby then gave the toast of the "Architects, Surveyors, and Engineers." He was glad to see Mr. Surridge, the Borough Engineer, present. He (the speaker) said that it certain by-laws had been carried out in a certain way, and then all at once they were interpreted in another form, it was rather hard upon builders. He mentioned a case of his own in which he had been required to spend an additional 70l. upon houses, none of which he would get back, as the work was contract. The Borough Engineer, in replying to the toast, said an architect was sometimes placed in a difficult position. He acted as a kind of intermediary between the builder on the one hand, who perhaps wanted to get all he could, and his client on the other hand, who wanted a good deal also. But if an architect in ordinary private practice had a difficult position, how much more difficult was that of a public officer, who was supposed to stand between the builder on the one hand, and the general public on the other. A great deal had been said with regard to the interpretation of the by-laws. Well, the by-laws were perfectly plain, and had been in use in Coventry for a number of years. The by-laws as laid down were

the by-laws framed by the Local Government Board. That being so, they could scarcely hold the Corporation responsible for them—they emanated from a higher authority. But as long as they were the by-laws of the city they must be obeyed. If the by-laws were not equitable and proper, then the proper thing to do was to get them amended in such a way as to make them proper by-laws. He believed that when the thing was properly sifted it would be seen that there was not much between them; as a matter of fact, he thought it would be seen that the differences were small and infinitesimal. Other toasts followed. During the evening a presentation was made to Mr. Garlick, jun., in acknowledgment of his services as hon. sec.

THE GEOLOGICAL MUSEUM, JERMYN-STREET.—The Science and Art Department Committee have recommended in their interim report to the House of Commons, the removal of this museum to South Kensington as part of the science collections. It was established in 1835, on the recommendation of Sir H. De la Beche, for the collection of geological and mineralogical specimens during the progress of the Geological Survey of the United Kingdom. The earlier specimens were first shown in a house in Craig-court, Charing Cross. The present museum, which contains a large number of exhibits relating to mining, metallurgy, and the plastic arts, was erected, with a frontage in Piccadilly, from Sir James Pennethorne's plans and designs, fifty years ago.

BOUVERIE-STREET.—We are informed that Mr. Henry Christian, of Messrs. Christian & Purday, is the architect of the new premises for which a site is now being cleared on the west side of Bouverie-street, between Essex and Playdell streets. Of the former houses that which stood at the corner of Essex-street is worthy of notice for it has been during many years the editorial headquarters of *Punch*, and the place of gathering for the weekly dinner of members of the staff.

THE LOWTHER ARCADE.—By order of trustees under the will of the late William Bird, the Crown lease of Lowther Arcade, Nos. 437-40, West Strand, and 5, 6, Adelaide-street, will be offered for sale on the 9th inst. The Arcade has twenty-five shops, with six in West Strand and Adelaide-street, covering a total of about 16,000 ft. superficial, and held under one lease, of which $3\frac{1}{2}$ years are unexpired, at a ground rent of 1,700l. per annum. It was built as a part of the extensive improvements made in that quarter in 1820-31, in pursuance of 7 Geo. IV. c. 77, and was named after Lord Lowther, the then Chief Commissioner of Woods and Forests.

CAPITAL AND LABOUR.

SWANSEA MASONS' WAGES.—Six months ago the Swansea masons gave notice to their employers to increase contracts at the end of April unless an increase of 1d. per hour was conceded. At a meeting held recently it was decided to adhere to this notice.

THE BRICKLAYERS' STRIKE AT SOUTH SHIELDS.—On the 27th ult. a conference took place between the master builders of South Shields and the men's representatives relative to the strike which is now in progress. The masters offered to concede the demand for an increase of wages from 9d. to 10d. per hour on condition that the bricklayers consented to come to an agreement with the plasterers, with whom they have had a long-standing dispute on the question of which branch is entitled to the work of cementing back-yards, &c. Both bricklayers and plasterers claim this class of work, but the latter are willing to leave it an open question. In offering to concede the bricklayers their advance in wages, the masters asked them to take a similar view, and leave the question open. This, however, the bricklayers refused to do, and the strike therefore continues.

LEGAL.

LOCAL AUTHORITIES AND SEWAGE DISPOSAL.

A judgment of general interest to local authorities throughout the country was given by the House of Lords on the 28th ult. The owners of a paper mill at Oswaldtwistle applied for a *mandamus* to compel the local authority to provide sewage accommodation by means of which they could run liquid from their works. This claim was made under the Public Health Act. The local authority denied that the plaintiffs could proceed under the Act, and maintained that if they had any remedy at all, it must be by application to the Local Government Board, who, if it thought a good case had been made out, could compel the local authority to carry out the work they had neglected. A *mandamus* was granted by the court of first instance, but this decision was reversed on appeal.

The Lord Chancellor, with whom the other members of the House concurred, took the view of the Court of Appeal, Lord Halsbury remarking that it would be unreasonable to permit a man to go into a small district and require the local authority to reconstruct its sewage system for his benefit.

The appeal was accordingly dismissed with costs. —*Liverpool Post*.

EMPLOYERS' LIABILITY CASE AT BIRKENHEAD.

At the Birkenhead County Court, on the 27th ult., his honour Judge Wynne Foulkes resumed the hearing of a case in which Mary Elizabeth Creighton, of Birkenhead, sued Richard Allen, contractor, Birkenhead, under the Employers' Liability Act, 1880, for 195l., the amount of three years' wages and overtime, as damages for the loss of her husband, Abraham Creighton, who died on January 11, 1898, from injuries received by falling from a scaffolding while in the employ of the defendant in the erection of a mill at the East Float, Birkenhead. The plaintiff's claim alleged that the injuries were caused by defects in the building plant, arising from the negligence of the defendant or his servants. In opening the case for the plaintiff Mr. Tobin said the deceased was wheeling a barrow along a scaffold which was only 2 ft. 3 in. wide, and in a rickety condition, when he fell 42 ft. to the ground, and died soon afterwards from the injuries then received. Evidence was given as to the construction of the scaffold, and particular attention was directed to the absence of "chocks" or inclined pieces of wood to facilitate the passage of wheelbarrows from one part of the stage to another where the planks overlapped. For the defendant it was submitted that no person actually saw the cause of the deceased's fall; there was no evidence of the misplacement of planks, and the whole case of the plaintiff had been one of conjecture as to how deceased met his death, and not proof that it was through defendant's negligence. The scaffold upon which the deceased was working remained intact, so that whatever caused the accident it must have been something done by the man himself. However painfully the accident might be for the plaintiff, they could not decide these cases on conjecture. Mr. Allen, the defendant, stated in examination that the deceased had been working for him as a labourer for six months. The scaffold from which he fell was an ordinary scaffold. Witness had been on it frequently, and it was perfectly right for workmen at that height or greater. After the accident the chocks were missing from one part of the scaffold. They ought to have been there, but men could work with barrows easily and safely without them. Evidence was also given by two of the defendant's foremen, who admitted in cross-examination that there had been complaints from workmen about the scaffold being narrow, and about the absence of chocks.—His Honour, in giving judgment, said that although negligence on the part of the defendant had been established, he was not entitled to infer that the cause of death was a direct result of that negligence. The verdict was therefore for the defendant, whose costs, however, on the point of negligence, were disallowed.—*Liverpool Mercury*.

LIVERPOOL CORPORATION BUILDING REGULATIONS.

At the Liverpool Police-court, on the 27th ult., Mr. Kinghorn, deputy stipendiary magistrate, heard two informations against the owner and occupier of the premises 250 and 252, Walton-road, charging them with default in complying with notice to remove certain additions to the front of the said premises, which additions, it was alleged, projected so far beyond the front main wall of the buildings on either side as to interfere with the uniformity of the building lines, and with the freedom of light and air.

Mr. Hope, for the Corporation, explained that the case was one of some importance, because similar circumstances governed a number of other cases. The evidence adduced by the prosecution showed that the addition to the building was in the nature of a "lean-to" roof, or verandah, projecting for 25 ft. 6 in. beyond the building line, and used for the exhibition of greengroceries.

For the defence, it was shown that the verandah was not of a permanent character, was partially removed at night, and did not come within the provisions of the Act under which the information had been laid.

The case was, after a lengthy hearing, dismissed.

NEGLECT TO GIVE NOTICE.

At the Southwark Police-court, on the 28th ult., James Carmichael, builder, of Wandsworth, was summoned for beginning the foundations of a new building without having given seven days' notice to the Bermondsey vestry. The magistrate fined the defendant 34l., with further penalties of 10s. a day for fifty-six days, and the costs of the summons, making 33l. 2s. in all.—*Daily News*.

MEETINGS.

FRIDAY, MAY 6.

Architectural Association.—(1) Mr. W. Eckstein, C.E., on "Interior Lighting (Reflected Lights, &c.);" (2) Mr. Tom Ekin on "Electric Lighting as Applied to Architecture," 7-30 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Mr. H. Fraser on "Evaporative Condensers and Independent Air-Pumps for same," 8 p.m.

SATURDAY, MAY 7.

Architectural Association.—Visit to the Crown Theatre, High-street, Beckham, by permission of the Architect, Mr. Ernest A. Runtz, 3 p.m. at the building.

Sanitary Inspectors' Association.—Mr. W. Wilkinson on "Dangers to Health arising from Defective Sanitation," 6 p.m.

British Institute of Certified Carpenters.—Visit to St. Paul's Cathedral, 3 p.m. Meeting at Carpenters' Hall at 5 p.m., when Mr. T. M. G. Lloyd will read a paper entitled "Some East Anglian Churches."

Edinburgh Architectural Association.—Visit to (1) Craigiehall; (2) Camo.

MONDAY, MAY 9.

Carpenters' Company, Carpenters' Hall, London Wall (Free Lectures on Carpentry and Joinery).—Professor T. Hudson Beare on "Strength and Strains in Wood," 7-30 p.m.

Society of Arts (Lecture).—Professor Caras Wilson on "Electric Traction," 11. 8 p.m.

Bristol Society of Architects.—Mr. G. Tuckey on "Plumbing," 8 p.m.

TUESDAY, MAY 11.

Society of Arts (Applied Art Section).—Mr. F. S. Ellis on "The Art of William Morris," 4.30 p.m.

WEDNESDAY, MAY 11.

Society of Arts.—Professor William B. Lewis on "Water Gases and its Applications," 8 p.m.

THURSDAY, MAY 12.

Society of Antiquaries.—8.30 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until June 13.

11,897. 10,479.—SHOWER TRAPS FOR WASTE PIPES AND THE LIKE: *W. Godfrey*.—The sewer-trap or drain-valve is a non-exhaustible valve seat secured to the inlet section in such a way that its joint is enclosed within the joint uniting the inlet and discharge sections, and the valve is loosely pivoted to a removable support detachably connected with the discharge chamber.

11,189.—WOOD PLANING AND MOULDING MACHINES: *G. Pickles*.—The improvements relate to the methods of (a) driving the feed rollers by an endless chain, and allowing the chain to adjust to the thickness of the timber, and (b) combining with the machines adapted to operate on two boards at once draw boxes and stationary plane irons or knives. For (a) are employed a driving chain gearing on the top feed rollers to sprocket or chain wheels on each side of the feed rollers, a carrier or guide wheel conveying the chain from the top to the bottom rollers, and means for moving the guide wheel coincident with the adjustment of the top feed rollers to the thickness of the timber, and for taking up the slack of the chain; and for (b) knives or planes set at an angle with their cutting edges directed upwards, and secured in a table or bracket that slides into and out of position in the machine's bed.

11,530.—WEATHER-PROOF METAL LINKAGE AND SIMILAR JOINTS: *C. T. Crowden*.—A tapered socket upon one portion of the joint receives a tapered pin, carrying, on its bottom portion, a leather or other washer to be inserted in the recessed portion of the bottom of the socket; at the pin's top is another washer, outside of which may be screwed an enveloping cap held in position by a split pin.—This joint thus described is more particularly applicable to the steering-gear of self-propelled vehicles, but the invention relates generally to metal joints exposed to weather and rain.

11,591.—DETERMINING THE DIRECTION OF TRUE NORTH AND OTHER POINTS OF THE COMPASS WHEN THE TIME OF DAY IS KNOWN: *A. H. Maurer*.—It is known, as the inventor says, that if a timepiece be held with the face horizontal and its hour hand pointing to the sun, a line drawn through the dial's centre from a point midway between the hour hand and point "XII" on the dial lies north and south, its commencement being to the left of the dial's centre, and its end being to the right, marked with the points of the compass and the other with the divisions of a clock-face, arranged upon a central pivot, and an index finger adapted to be turned to indicate the true solar time upon the clock disc and then pointed towards the sun, the compass disc being then turned with its south point midway between the index finger and "XII," so that the compass disc will indicate the points of the compass. (Conversely, if the numerals "XII" and "VI" of a watch be laid on the meridian of any place, the true solar time at that place may be calculated by observation of the divisions on its dial.)

12,577.—HINGES FOR DOORS, WINDOWS, AND THE LIKE: *F. H. Collins*.—The hinges are single-jointed, in each end of the single joint a recess receives a steel cup in which a ring of steel balls can revolve, in the corresponding end of the two outer joints are steel pins whose ends are shaped to fit inside the ring of balls; or the hinge may be made with one short joint on each flap and a recess in one joint for the balls with a pin fitted in the other joint.

13,573.—SUPPLY OF DISINFECTANTS TO STREET, ROAD, AND OTHER SIMILAR SURFACES: *W. H. Hovey*.—The disinfectants are distributed by means of a water-cart, and a vessel containing the material in crystal or solid form within the cart, so arranged as to dissolve a certain quantity of the material and supply it automatically to each cart.

14,054.—FLUSHING APPARATUS FOR WATER-CLOSETS: *P. Liebig*.—The contrivance is spherical in shape, the clearing valve of the flushing recipient is formed with a flexible ball resting in a conical box and raised by a spike or peg; the ball rises freely between a guide, so that by a single pull of the lever a complete emptying of the recipient is effected.

24,179.—MANUFACTURE OF CEMENT: *C. E. Lee and C. F. Lawton*.—The cement (for cementing one article to another) is composed of tetrasilicate of sodium, with calcium carbonate, powdered quartz, silicate and aluminate of lime, soda, or silicate and aluminate of lime, soda, and iron, and anhydrous antimonite oxide; sodium tetrasilicate (Na₂Si₂O₆) is prepared by fusing together 180 parts of white sand and powdered quartz, 100 of calcined soda ash, and 40 of charcoal; when cool the hard mass is reduced to a fine powder and boiled in water, to three gallons thereof, containing, say, 17 per cent. of sodium

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Schools	Wrexham County Schools.....	6d. ; 20s.	No date

CONTRACTS

Nature of Work or Materials.	By whom Required.	Forms of Tender, Ac. Supplied by	Tenders to be delivered
Offices, & Southampton Docks	L. & S. W. Ry. Co.....	John Dixon, Docks, Southampton.....	May 10
Painting Work, &c. New Road, Hampton, N.W.	J. W. Fern, 27, High Street, London.....	H. Hensdale.....	do.
Laying Cast Iron Water Pipes	Chester-le-Street R.R.C.	R. W. Smith, 15, Ramsey at Chester-le-Street.....	do.
Offices and Additions to Town Hall	Lowestoft T.C.	G. B. Heslop, C.E. Town Hall, Lowestoft.....	do.
Alterations to Wesleyan Chapel, Citherowick, Hull.....	.....	F. Freeman & Co. Archt. 11, Carlisle, Hull.....	do.
Steel Girder Bridge, Platt's Brook, Llaman.....	.....	P. Fulton, Offices Preston.....	do.
*Washing Machinery	Barrow Green Guardians	James G. McNeill, Wellington-st., Barrow	do.
Sewerage Works	Bedlingtonshire U.D.C.	G. D. Foster, 54, Grindall at West, Newcastle on-Tyne	May 11
Engins H use, &c. Melling Pumping station	Sr. Helen's (Lancs.) Corp.	J. J. Leland, C.S. Town Hall	do.
Re-sewing Roads	Wokingham T.C.	Surveyor, Town Hall	do.
New Girder Piers and Shupe, Ship- bow, &c. Durham .....	.....	N. Bailey, Durham.....	do.
Road Works, Warrington	Croydon Corp.	Whitney Engr. Town Hall, Croydon.....	do.
Two Shops, Stricklandgate	Lancaster Bank'ng Co.	C. L. Hogarth, Archt. 69, Highgate, Kendal.....	May 12
Additions to Hospital, Boston	Warwick Union	I. Bewell, Archt. Borough Offices, Boston, Lincs.....	do.
*Laundry Buildings	Llangefelw County Schools	P. J. Rogers, Archt. B. Jury-st. Warwick	do.
*H Deal Seat Boxes	Fulham Union	Headmaster, Nassi Villa, Langfeldt.....	do.
Additions to Police Station, Bargate	Southampton Corp.	The Master at Workhouse, Borough, Southampton.....	do.
*Painting	St. George in the East Guardians	W. B. G. Bennett, Boro' Office, Southampton.....	May 13
Paving Works	Bathgate Burgh Com- missioners	A. G. Wilson, Vestry Hall, Calcutta	do.
Schools and House, Athlone .....	.....	F. W. Mackay, Town Office, Bathgate, N.B.....	May 11
Church, Tallomere, King's county.....	.....	Northgate street, Athlone W. Hague, Archt. 50, Daw- son-st., Dublin.....	do.
Fire Station, A.C. High Union	Wednesbury Corp.	E. M. Scott, Borough Engineer, Town Hall.....	May 15
Church Spire, Weston Point	Weaver Navigation Trustees	J. A. Cresswell, C.F. Weaver Navigation Engineer's Offices, Northwich.....	May 16
Lodging House, St. Michael's-square	Southampton Corp.	W. G. Bennett, Borough Engr. Municipal Offices at S. W.	do.
Aqueduct (Contract No. 11)	Birmingham Corp.	Victoria-terrace, Westmin- ster, S. W.	do.
*Asphalt Paving	Islington Vestry	J. F. Barber, Vestry Hall, Upper-st. N.	do.
At-home Buildings, Pavett-street, Sunderland.....	County Boro, Croydon	J. Kirrieham Archt. 83, John-street, Sunderland.....	May 17
*Store and Workshop Building	do.	A. Broad, 24, Gloucester-st., Croydon.....	do.
*Repairing Street	do.	Road Surveyor, Town Hall	do.
*Underground Conduits	Corporation of London	The Engineer, Guildhall, London.....	do.
*Sewers, &c.	Wimslow U.D.C.	Officers, Wash-street, Wim- slow.....	do.
*Kerbing, Channelling, &c. Higher Green-lane	Lewisham B. of W.	Surveyors, Dept. of Public Works, Catford, S.E.....	do.
*Kerbing, Channelling, &c. Padmore Green-lane	do.	do.	do.
Waterworks, Malling	West Launce. R.D.C.	J. J. Lackland, C.E. Town Hall, Exeter.....	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	To be delivered
Destructor Shed, &c.	St. Helen's (Lancs.) Corp.	G. J. C. Broom, G.E. Town Hall	May 1
Additions to Royal Albert Asylum, Lancaster	Bethnal Green Vestry	W. J. Barratt, Vestry Hall, Church-ro, Bethnal Green	May 1
*Drain Pipes.			
*Drill Hall and Gymnasium, Bantess	Kenington & Chelsea School District Council	W. J. Barratt, Vestry Hall, Church-ro, Bethnal Green	May 1
Interior Repairs and Painting.	City of London	W. S. Cross & Kewick, 18, Upper St. Mark, Finsbury, E.C. 2	May 1
Five Store Warehouses, Grass-street	Bainbridge & Co. Ltd.	T. Winn, Archt., 25, Albion-st., E.C. 4	May 1
*Offices, Teachers' Court, Furnivall, and Stores	East Ham S.R.	E. L. Curtis, 120, London Wall, E.C. 4	do.
*Painting Rochester Bridge	The Bridge Wardens	Alfred Adams, 10, The Precinct, B. Chester	do.
*Reconstruction of Buildings at Asylum	A. & M. S. Lough, Asylum	G. O. Miles, 35, Parliament Street, W. 8	May 3
*Repairing and Repointing Wall, &c.	Corporation of London	The Engineer, Guildhall	May 3
Workhouse Infirmary	Farnham Union	Friedl & Lloyd, Archt., Drayman of Aldershot	May 3
*New Buildings and Alterations at Workhouse	Newport (Wales) Union	B. Lawrence & Son, Dock-street, Newport	May 3
Refectory, Nurses		J. P. Key, Archt., 31, Prudential Buildings, Leeds	May 3
*Removal of Chimney	Edinburgh and Leith Gas Co. Ltd.	W. R. Herring, Gas Works, Leith	May 3
Shed Yards, &c.	Senner et County Agr. Co. Ltd.	A. B. Coatham, Shore Yard	June 1
*Unalder Tank.	Eska Bourne Gas Works	H. E. J. Ness, Harford-st., Stepney	June 1
Buildings, Station-terrace, Cardiff	W. M. C. Acock	John G. Cochrane, 18, St. Mary's, Cardiff	No date
Warehouses	Yongestrand & Malvern Laundry Co.	Carlisle	do.
Chimney, Abberly Mills, Kirkstall, near Leeds		G. E. Arundel, 24, Aldon-st., Leeds	do.
Sheds and Residences, King's Cross	Dobbin & Co.	A. Hill, At. wt. 22, George's-st., London	do.
Five Houses, Evesham-road, Cork	Miss Falconer	Settle & Palmer, Archt. Co., 10, St. George's-st., Dublin	do.
Farm Buildings, Urewick, Lancs.		F. R. Kempeny, Archt. 19, High-st., Cardiff	do.
Church (St. John's), Newport Mon.		W. J. Wood, Archt., 29, Alexandra-st., Southend	do.
Buildings, Marine-parade, Southend	Warwick's Revolving Tower	E. Wright, Archt., Southend-on-sea	do.
Three Houses and Shops, Huddersfield	G. A. Pithie	W. J. Wood, Archt., 29, Alexandra-st., Southend	do.
Extension of School, Greengate, &c.	Eschelsall Sch. Bd.	W. J. Wood, Archt., 29, Alexandra-st., Southend	do.
Bus new Premises, High-st. Evesham		Victorians, Quare, Leeds	do.
Two Houses, Jubilee-street, Hove	J. C. Eddershaw	Jones & Rowlands, Archt. Co., 10, St. George's-st., Dublin	do.
Laying Cast Iron Main	Belper R.D.C.	M. Hall, Archt., 29, North-gate, Halifax	do.
Concert Hall, Free Trade Hall, Manchester		J. B. Mason, Eng. Duf., 24, New Bank, Derby	do.
Eight Shops, &c. Commercial-street and Fountain-street, Halifax		W. C. Williams, At. wt. 22, George's-st., London	do.
Cottages Baking, Walton, Norfolk		H. J. Green, Archt., 31, Leslie-st., London	do.
*Two Double Kitchen Ovens	London County	Resident Engineer, at	do.

PUBLIC APPOINTMENTS

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Resident Electrical Engineer	Poplar E. of W. ....	.....	May 1
*Deputy City Surveyor	Carlisle Corp.	1262, rising to \$2000.	May 2
*Surveyor	Bentley U.D.C.	\$2004 per annum	May 2
*General Foreman	We thamshaw U.D.C.	\$4 10s per week	May 2
*City Engineer	Corp. of City of Cape	\$6001. per annum to con-	

Those marked with an asterisk (*) are advertised in this Number. Competitions on iv. Contracts on iv & vi. Public Appointments on xviii & xv.

Hammersmith—165, The Grove, u.t. 78 yrs., g.t. 121, r. 55 <i>l</i> .	£500	Clapton—77 and 73, London-rd., u.t. 61 <i>l</i> yrs., g.t. 161, r. 56 <i>l</i> .	£620
By DARRAH, T. & CO., LTD.		By SEDGWICK & WEALL (at Watford).	
Hersham, Surrey—1 The Burvale Estate, comprising 81 a. 3 f. 7 p., a freehold estate, comprising 88 a.	12,000	Watford, Herts.—Bushy Hall-rd., 1 Moresby, f., e.t. 60 <i>l</i> .	780
By T. R. P. & SONS	6,000	By PROTHERO & MORRIS (at Watford)	
"Woodlake Farm," area, u.t. 99 p., f. 1, r. 17 p., f. 18 p.	2,000	Halstead, Essex—High-st., "Bridge House" 1, also 1, 2, and 3, Old Tan-yard, f., 36 <i>l</i> . 6 <i>l</i> . 5 <i>l</i> .	530
41 <i>l</i> . 18 <i>l</i> .		1 and 2, Paragon-square, f., r. 12 <i>l</i> . 2 <i>l</i> .	130
Bakerie-land, a copyhold cottage and orchard, 1 a. 0 f. 25 p., f. 2 <i>l</i> .	350	9, 10, 11, 12, 13, 58, 59, 60, and 61, Trinity-sq., f., r. 8 <i>l</i> .	955
Thrupp's lane, two enclosed plots, g.t. 1 p., f. 1 p., f. 1 p.	775	By J. H. HIBBARD & SONS	
"Pleasant Place" and 17 a. 0 f. 21 p., f. 1, r. 8 <i>l</i> . 0 <i>l</i> .	1,450	Hendon—1 and 2, Milton-rd., u.t. 84 yrs., g.t. 10 <i>l</i> .	280
Green-land, two freehold cottages and 1 r. 19 p.		Wandswoth—44, Riverhall-st., u.t. 34 yrs., g.t. 41	215
By BROOK, T. & SONS		10 f., 39 <i>l</i> .	
Burwood-rd., "Vine Cottage," and 1 r. 37 p., f. 1, r. 35 <i>l</i> .	730	Willesden Green—200, 204, and 206, High-rd., u.t. 60 <i>l</i> yrs., g.t. 15 <i>l</i> . r. 36 <i>l</i> . 8 <i>l</i> .	2,205
Burwood-rd., two freehold cottages and 34 p.	455	Hamstead—26 <i>l</i> , 28, and 30, Kingdon-rd., u.t. 82 <i>l</i> yrs., g.t. 25 <i>l</i> , e.t. 60 <i>l</i> .	1,750
By BROOK, T. & SONS		By E. TIERNEY & SONS	
Sevenoaks, Kent—London-rd. and two freehold building sites	985	Hackney—125, Downs-rd., e.t. 55 <i>l</i> .	750
Manor-pl., an enclosure of land, f., r. 10 <i>l</i> .	370	Brixton—1 to 9, Ridgway-rd., u.t. 63 <i>l</i> yrs., g.t. 14 <i>l</i> . 10 <i>l</i> .	1,590
Hamstead—1 a. 0 f. 2, Fairfax-yd., and 52 and 52 <i>l</i> , Airstair-mews, u.t. 56 yrs., g.t. 65 <i>l</i> , r. 56 <i>l</i> .	1,480	Edmonton—20, The Crescent, f., r. 26 <i>l</i> .	355
By TUCKETT & SON		By PORTER & CO.	
Winchmore-hill—Green-lands, part of "Godard's Field," comprising 2 a. 2 f. 27 p., f. 1, r. 1 p.	2,000	Southend-on-Sea—4, Warrior-sq., f., r. 65 <i>l</i> .	1,210
By R. H. F. & SONS	3,000	St. Leonard's-rd., "Ilfracombe," f., r. 28 <i>l</i> .	40
39 p.		Woodgrange-drive, a plot of building land, f. 1, r. 16 <i>l</i> .	162
By J. W. TRUMAN (at Masons' Hall Tavern).		By PROTHERO & MORRIS (at Watford)	
Acton—37, Churchfield-rd., with goodwill, and office-licences attached, u.t. 20 yrs., r. 70 <i>l</i> .	1,400	Braintree, Essex—59 to 73 (odd), Manor-st., f., r. 68 <i>l</i> .	1,120
By C. W. DAVIES		By ALFRED SILVERST (at Tottenham)	
Hastocks Gate, Sussex—1 The Bungalow" and nearly 4 a., f.		Edmonton—60, Silver-st., f., r. 52 <i>l</i> . 10 <i>l</i> .	900
Dalston—79, 81, and 83, St. John's-lane, u.t. 51 yrs., g.t. 61 <i>l</i> , r. 51 <i>l</i> .	1,000	<i>Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u. for unexpired term; p.a. for per annum; y.s. for years; st. for street; rd. for road; sq. for square; p. for place; t. for terrace; cres. for crescent.</i>	
Islington—66, Arlington-sq., u.t. 29 yrs., g.t. 61 <i>l</i> . 6 <i>l</i> . 8 <i>l</i> . 40 <i>l</i> .			
141, Packerington-st., u.t. 36 <i>l</i> yrs., g.t. 74 <i>l</i> , r. 74 <i>l</i> .	400		

PRICES CURRENT OF MATERIALS

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ILLUSTRATIONS.

Aberdeen Architecture:—	Double-Page Ink-Photo.
The Town House. (Messrs. Peddie & Kinnear)	Double-Page Ink-Photo.
Additions to Marischal College. (Mr. A. M. Mackenzie, A.R.S.A.)	Double-Page Ink-Photo.
Colonnade and Monument (the late John Smith); Music Hall (the late A. Simpson); Union Bank (Barn of Haddington)	Double-Page Ink-Photo.
Buildings in King-street (the late John Smith); Free South Church (Mr. A. M. Mackenzie, A.R.S.A.)	Double-Page Ink-Photo.
Art Gallery (Mr. A. M. Mackenzie, A.R.S.A.); Savings Bank (Mr. Wm. Kelly); School Board and Parish Council Offices	Double-Page Ink-Photo.
(Mr. A. M. Mackenzie, A.R.S.A.); Northern Assurance Offices (Mr. A. M. Mackenzie, A.R.S.A.)	Double-Page Ink-Photo.
Free Hallom Church (Messrs. Brown & Watt); Queen's Cross Free Church (Messrs. Pirie & Clyne), United Presbyterian Church (Messrs. Ellis & Wilson); St. Peter's (Messrs. Kinross & Tarbolton); St. James's Episcopal Church (Mr. A. Clyne); Free High Church	Double-Page Ink-Photo.

Blocks in Text.

Aberdeen Architecture	Aberdeen Architecture (continued):—
Frieze, Part of Market Cross	Lodging House near King-street
Commercial Bank	King's College
Doorway of Savings Bank, Union-terrace	Lead Frieze, King's College
The Gordon College	The Chapel of the Sisters' Hospice of St. Margaret of Scotland
Free Public Library	Victoria Lodging House
West End of West Church	Old Lead
Bon Accord Free Church	The Market
Elevation of Marischal College as Proposed to be Modified in order to Preserve Greyfriars Church	Custom House
County Hotel, King-street	Cable in Shiprow
Fire Station	The Dee Bridge
East Window, Greyfriars	Fountains in the Green
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The Architecture of our Large Provincial Towns.

XV.—ABERDEEN.



ALTHOUGH Aberdeen is by no means one of the largest towns in Great Britain, its population being only about 110,000, there are few which are so interesting and effective in an architectural sense. This is partly owing to the extensive use of granite, which may be said to be the building stone of the district; a material which not only ensures a monumental and dignified effect in street architecture, even when used in the plainest and most unadorned form, but which also exercises an indirect effect on architectural design, as it lends itself so exceedingly well to design of a broad, classic, and monumental character, while at the same time its hard and stubborn quality is a natural check against that over-exuberance of detail which is one of the most frequent sins of modern street architecture. It is not easy to produce gimcrack detail in granite, since the cost of such work would be practically prohibitive.

The name of the city is variously written in old documents as Aberdaen, Aberdeen (which suggests a connexion with the Don river), Abirden, Aberdaene, or Abyrdene, and many derivations have been offered of the name, none of them very convincing, and with which therefore we need not trouble ourselves. The city has a very long history; its motto of "Bon-Accord" is said to have accompanied the armorial bearings bestowed on it by Bruce in recognition of the successful rising of the citizens against the English in 1298, when "Bon-Accord" was the watchword. In 1336 the city was burned and almost entirely destroyed by Edward III. on

his march southward; and being rebuilt a few years afterwards, is supposed to have then got the name of "New Aberdeen," though in reality the history of the city dates further back than that of the adjoining hamlet known as "Old Aberdeen." It should be observed that the name of Old Aberdeen does not refer, as the visitor might naturally suppose, to the older portions of the main city as distinguished from the modern quarter; Old Aberdeen, though now closely associated with Aberdeen proper, is a distinct place, a mile and a half or so from Aberdeen Town House and the neighbouring streets which form portions of the old town of Aberdeen. To it appertained St. Machar's Cathedral, of which we gave an account and illustrations in our series of the Scottish Cathedrals (see *Builder*, Sept. 2, 1893), and also King's College, which still stands out in the fields near the end of King-street.

Aberdeen proper may be described as being roughly an irregular quadrilateral, bounded at the eastern and narrower end by the sea-shore and the links, and on the south by the river Dee; Union-street, running nearly east and west, forming the central line or backbone of the principal portion of the town. The centre of Aberdeen, not geographically (for it is near the south-east corner of the town site), but in the sense of being the point from which things in general radiate, is Castle-street, so-called; it is in fact more like a square or what the French call a *place*, than a street, and on its central axis stands the characteristic Jacobean market cross, a hexagonal erection with a small order of ionic columns, bunches of flatly-carved foliage rather awkwardly placed in the spandrels of the arcade, and a thin tapering stone shaft rising from the centre of the roof, with a heraldic unicorn as terminal. The cross formerly stood higher up the *place*, opposite the old Tolbooth Tower (now incorporated in the modern Town Hall), and is said to have been then a closed erection, the interior of which was put to practical use as a coach-

office; when it was rebuilt in its present situation in 1842, the arches were left open and it became (more suitably) a merely ornamental and historical erection. It dates from the end of the seventeenth century. The half-length portraits of various Scottish and English kings, in the panels of the balustrade, are of very fair execution, and probably by French hands; the band of carved ornament, forming the frieze of the order beneath, shows a curious mingling of Renaissance and Mediaeval feeling; we give a sketch of one length of it. The whole is a curiously exotic-looking production to be met with in the streets of a Scotch town. At the east or lower end of Castle-street the Salvation Army has taken up a remarkably assertive portion with a large granite building occupying the whole end of the place, and facing the line of Union-street, called their "citadel," and designed in a combination of castellated and ecclesiastical Gothic; a tower with corbelled-out turrets of weak and lanky appearance over the entrance, while more to the right are large pointed windows of two lights each, with a circular opening over them cutting down very awkwardly close into the extrados of the lower lights. Altogether, the building is much more pretentious than powerful. It is faced at the upper end of the *place* by the small neat-looking building which once was the Athenæum, and now is the Athenæum Hotel; in the centre of the principal face appears a row of four half-engaged ionic columns carrying an entablature, and looking as if stuck on to the face of the wall; an interesting memorial of the days when some such detail was necessary to stamp a building as the "Athenæum." At the north-west corner of the *place* is an important and dignified building, the Union Bank of Scotland, by the late Mr. Burn, at the angle of King-street; of somewhat stern and bare architecture, with a modillion cornice and attic, its general flatness relieved by the effect of a quadrant colonnade at the angle

(see lithograph), forming an entrance porch, a feature decidedly effective both in itself and from its prominent position. Castle-street contains one or two examples of the older houses of the town, but nothing else of any special interest.

The Town Hall, or Town House as it is called here, by Messrs. Peddie & Kinnear, the first erection on the north side of Union-street, partly faces Castle-street, but belongs more to Union-street. In regard to its principal façade and tower this building (of which we give double-page plate taken from a large water-colour drawing lent by the present Mr. Peddie) takes a high place among provincial Town Halls, being above the average in vigour and originality of treatment. The ground story shows a series of elliptical arches springing from sturdy columns with plain moulded capitals, and above these a long line of small arcaded windows gives a horizontal train to the lines of the building, and binds the whole together. The line of the front is broken rather happily by two small semi-circular projections, which, developing from large wall shafts in the basement, culminate in circular turrets when they rise above the roof-line. Some finish of the kind seems wanting to the massive corbelled-out blocks at the eastern angle of the front, which are cut square off at the top as if the architect, having carried them up so far, had been at a loss what to do with them. The tower and the upper portion of the building generally repeat the now rather too familiar characteristics of Scottish castellated architecture, in a tolerably effective manner. The mouldings and other details are rather coarse in scale and profile, which is no doubt to some extent due to the intractable nature of the material used. Of course the criticism may be made that a style of detail should be employed to which granite more thoroughly lends itself, and in some others of the new buildings this has been very conscientiously done, better than in the Town House; which is nevertheless a fine building and merits the local appreciation which it receives. The small tower seen on the right of the view, and a little way back from the line of frontage, is the old Tolbooth tower, before referred to as incorporated in the modern building.

Union-street, running nearly east and west, is the principal street in Aberdeen, the backbone of the town, and a very important factor in the general character of modern Aberdeen, as it forms a bridge crossing the valley in which the railway now runs, and connecting by a level roadway the central and older portion of the town with the western extension; Aberdeen following the usual rule with modern cities of extending its residential portion mainly in a westerly direction. Union-street, like Holborn-viaduct, is therefore for part of its progress a high-level street bridging over the older streets on the declivity and in the valley, and is carried over the railway and the narrow portion of the valley by a boldly-designed bridge in one large arch. Part of the low ground at this point, adjoining the line of railway, is laid out as a public garden, skirted on the west side by Union-terrace, at right-angles with Union-street and carried on a kind of rampart of stone rising above the garden, from which it is reached by long flights of steps. As some of the best buildings of new Aberdeen are being raised along this terrace, it has a fine effect, with the gardens at its foot and the view of the older portion of the town beyond, and is the most picturesque portion of the city. Union-street itself produces a dignified effect as a whole, from its long straight line and the clean solid appearance of the granite fronts, though in reality it does not contain many buildings which are of much interest or effect when taken singly, and the habit of keeping the reveals of the windows shallow gives a flat character to the buildings lining the street, only relieved here and there by the more powerful details of some of the principal buildings. Next above the Town House, on the same side, the *Free Press Office*



Part of Frieze, Market Cross (see last page).



Commercial Bank. (S. Mitchell & Wilson.)



Doorway of Savings Bank, Union-terrace. (Mr. Kelly.)



The Gordon College.

building, by Messrs. Ellis & Wilson, shows a certain degree of originality and finish in detail; the cornice in particular is not an imitation of any form of classic cornice; its main portion is of segmental or elliptical section decorated with circular rosettes and a triglyph-like feature alternating. The only objection to the design is, perhaps, that the detail reminds one a little too much of cabinet-making on a large scale. The new block of shops and offices next to it, by Mr. Wilson, shows a sturdy granite treatment, with mullions and transoms of absolutely plain square section; the cornice is a little coarse in detail (again the result of the

limitations of the material). The line of the piers between the shops on the ground floor is carried up by chamfered buttress-like projections with the cornice above breaking round them; the effect would have been better if the ground floor piers had been wider and heavier. The boldest portion of the building is in fact the back elevation, looking on some inferior streets, which is treated in three great arched bays rising the whole height of the structure, with narrow granite piers, the intervening spaces filled in with glass and iron. The Town and County Bank, a little higher up, is a medley; the middle portion treated very academically

with a large pilaster order running through two stories, while the circular-headed windows in the wings seem to belong to another class of design, and the decorative detail is of a very conventional type. On the other side of the street, a little higher up, the granite front of the North British Insurance Office shows a very plain and much less pretentious treatment—a rusticated arched ground floor with an order of very plain pilasters of little projection above; it has the merit however of complete unity of design, and of introducing no detail unsuitable for the material employed. Nearly opposite, the Commercial Bank of Scotland (see sketch) breaks the routine of classic or "plain wall" fronts by a narrow façade in a variety of late Gothic, carried out in granite of two tints, reddish for the main face and grey for the dressings; it is a pretty bit of work but hardly suggests a bank, and moreover looks curiously out of place amid its surroundings. The architects are Messrs. Mitchell & Wilson, of Edinburgh.

Proceeding further westward along Union-street, we come to one of the most characteristic bits of Aberdeen architecture, the columned screen which forms the street boundary of the principal churchyard, that of the "East and West Churches." This is a very good piece of classic work of its type, designed by the late John Smith, an Aberdeen architect of considerable note in the earlier part of the century. One of our lithographs shows a part of the screen as seen from the inside of the churchyard, grouped with a large Doric tomb by the same architect, and a portion of the very solid-looking angle building immediately westward of the churchyard. The whole group gives a good idea of the severe style of Classic architecture in vogue in Aberdeen at the time Union-street was made, and to which granite lends itself so well. The screen has a large gateway in the centre, the colonnade being repeated symmetrically on each side; the massive gilt iron grille is a good specimen of cast iron design of its date. The "East and West Churches," as they are called, form architecturally one building standing due east and west and therefore at a slightly oblique angle with the Union-street screen, which is rather an advantage to the general effect, as it separates the building from the classic scheme of the screen and the street architecture, with which it has nothing in common. The building has the appearance of a very large parish church with a central tower and spire, and in fact stands on the site of a great mediæval church, of which the nave, dating from the eleventh century, is said to have occupied the site of the present west church, and the choir, not built till the fifteenth century, that of the present east church; a very unusual instance, if this history is correct, of the nave of a mediæval church being built before the choir. At present, the west church is an eighteenth-century erection by Gibbs (who, it may be remembered, was a native of Aberdeen), on the site of the ancient nave, while the transept and the east church form a piece of cast-iron modern Gothic built after the old choir was pulled down early in the present century. We give a sketch of the west end of Gibbs's church (p. 458). The central spire, built about five and twenty years ago from the design of Messrs. W. & J. Smith, is a rather effective one, though the two horizontal bands of moulding and corbels round it are rather too strongly pronounced. Beneath the new east church there still exists the ancient crypt, now called St. Mary's Chapel, which includes the only mediæval vault now existing in Aberdeen. This we did not see; as usual in Scotland, the places of worship are all religiously (or irreligious?) locked up during the week, and whatever there may be worth seeing in their interiors is not to be discovered without a greater expenditure of time than it is possible to give in making a comprehensive survey of a town.

Before going further up Union-street we may diverge for a moment to Union-terrace,



Free Public Library (Messrs. Brown & Watt.)

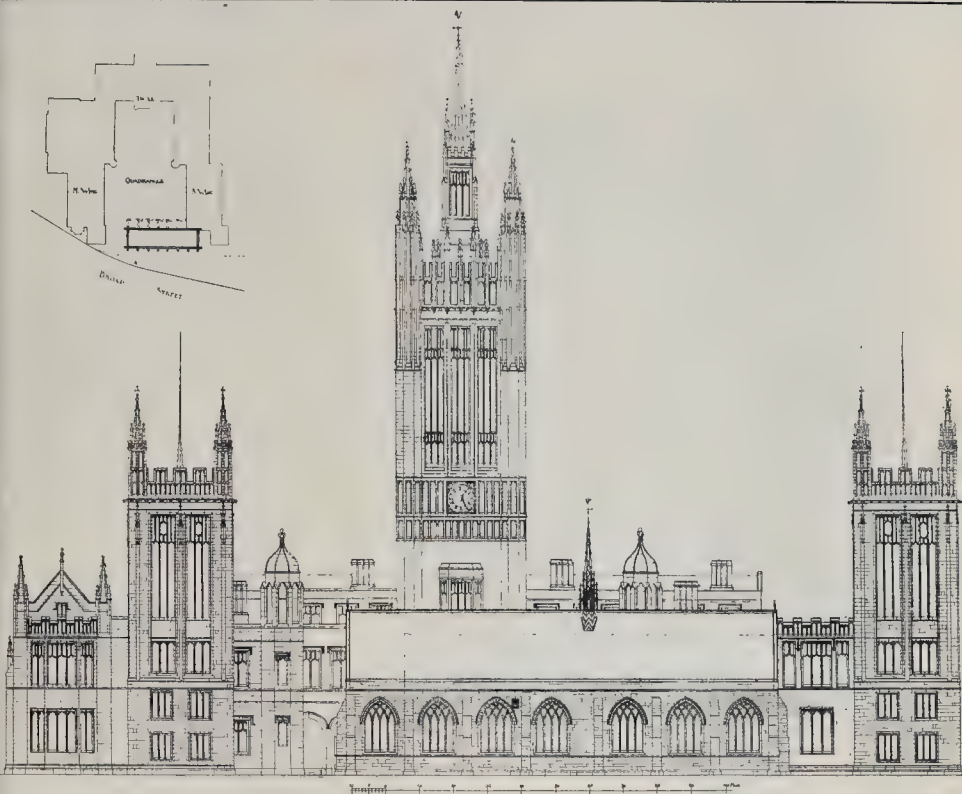
WEST END OF WEST CHURCH, BY GREEN.



the site of a row of some of the best modern buildings in the city, which are shown in three views on one of our lithograph sheets. At the angle with Union-street is the very refined and well-considered building for the Northern Assurance Company (Mr. Mackenzie), giving another example of the quadrant portico at the angle which seems rather a favourite incident in Aberdeen; the design suits very well the clean surface and clear-cut lines of the granite; the ground and upper story are well contrasted in character. It may certainly be urged that the coupled columns carry nothing but a console setting back to the wall line; but it cannot be denied that they look very pleasant to the eye. Passing the



Bon Accord Free Church.



Elevation of Marischal College as Proposed to be Modified in order to Preserve Greyfriars Church (See Page 460).

front of the Grand Hotel (Mr. Mackenzie) which has at least the merit of avoiding the commonplace ornament generally considered proper to hotels, we come on three new buildings in a row; the Savings Bank (Mr. Kelly), the Parish Council Offices and the School Board Offices (Mr. Mackenzie), the two latter still unfinished internally. The Council Offices, the centre of the three, is a striking design, as will be seen from the lithograph, with its bold rustication for two stories, the lofty doorway, and the graceful columnar order in the upper story; only the effect of the window sill course carried square round the circular columns is a little awkward. The treatment of the School Board offices can be sufficiently seen from the illustration; it is original, with its classic buttresses (as they may be called) going up between the pedimented windows, though the cornices round these projections, the upper member only of which is connected with the rest of the design, seem rather a gratuitous assumption. Of the first of the three buildings, the Savings Bank, we give a separate illustration; though very simple, it is an admirable specimen of a front designed for granite, especially in the bold and effective rustication of the first floor windows. We give also an illustration (p. 457) of the entrance doorway. Then if we proceed to the end of Union-terrace we find ourselves opposite two buildings grouped together and forming an effective contrast; the Free Library (Messrs. Brown & Watt) and the Free South Church, a view of which is given on the same sheet with the Union-street screen. The lower portion seems rather bald, but the dome is very graceful in design. It does not, however, show as an internal feature in the church, which is to be regretted. The Free Library (see cut) is a suitable-looking building with refined details and a good general

effect, but the treatment of setting back the ends slightly seems rather a weak one, especially as the doors are in those portions; we should have preferred to see the ends brought forward and the centre set back. At the right of the sketch is seen Mr. Stevenson's Wallace statue, a good deal over life size, and mounted on an artificial rock to give greater sublimity; there is a certain amount of energy in the figure, but on the whole it is rather a tawdry work. The centre of Union-terrace boasts a statue of Burns, a somewhat weak affair—indeed, Burns is much more a subject for painting than sculpture, since his personal attraction lay entirely in his vivacious expression and dark eyes—and at the Union-street end is a still weaker one of the Prince Consort; one of Marochetti's courtly productions. Open air sculpture does not fare better in Scotland than in England.

Returning to Union-street, we find higher up the massive colonnaded front of the Music Hall (see lithograph) formerly called the County Hall; nothing could be plainer or more academical than this square block with the pilasters at the angles and the orthodox Ionic columns to the portico; and yet it looks so massive and strong in the hard granite, and the capitals are such excellent pieces of conscientious workmanship, that there is a satisfaction about the building nevertheless. It is a pity that people are allowed to disfigure the colonnade (as shown in the illustration) by using the columns as supports for advertisement boards. Careful workmanship, we may observe, seems to be one characteristic of Aberdeen architecture, and here again we may trace the influence of the prevalent materials; if you have to work detail in granite, it takes so much working to do it at all that it is worth while to do it well.

The interior lobby of the music hall, with its columned screen at each end, and elliptical dome, is a graceful piece of interior treatment. The architect was Mr. Simpson, the designer of what we called the cast-iron Gothic of the East Church; his sympathies and capabilities seem to have been more in the direction of classic design.

If, after going to the end of Union-terrace, instead of returning we turn westward up Rosemount Viaduct, we come on two of the more modern quasi-classic churches, St. Paul's U.P. church, a kind of mixture of Renaissance and Scotch castellated Gothic, and opposite to it the Bon-Accord Free Church, of which we give an illustration. Further westward, up Skene-street, is the Grammar School, standing in an effective position a long way back from the road, with a wide open space in front of it. We have no illustration of this building, which is a very successful application of castellated Gothic to a modern building, picturesque and well grouped. Returning eastward again, we find some little way in the rear of the Free Library the square solid classic block of the Royal Infirmary, its centre formed by a low plain semicircular dome just seen above the façade when viewed from a higher position. In fact the building, standing rather low, seems to have been specially designed to be seen from the higher ground. Almost sternly plain, it is nevertheless an exceedingly dignified and important-looking building. In its rear a large addition has been made by Mr. Saxon Snell (in collaboration with the City Architects—Messrs. W. & J. Smith) on the modern system of hospital planning; this portion of the building represents the utilitarian element, modestly shrouded behind the more dignified and impressive mass of the older building. Coming down



County Hotel, King-street. (Mr. Clyne.)



Fire Station, King-street. (Mr. A. H. L. Mackinnon.)

eastward again, we come on the long low façade of the Museum and Art School; the front being however a mere screen wall, as we see at the end the thickness of the wall without any return but an older wall which butts against it at right angles in a rather odd manner. The front (see lithograph) is plainly but suitably treated, the entrances to the Museum and Art School being marked, on each side of the centre, by an order of columns and a pediment which break the long low line of the façade. The central entrance with its elliptical arch gives access to the grounds of the Gordon College; the entrance is effe c

tively treated externally, but when we turn round after entering the college grounds, the back of the *fronton*, in rough masonry, has a very unfortunate effect, as if it were designed for outside show only. The Gordon College (see cut, p. 457) standing at the back of its spacious grounds, is an interesting old building, the centre portion a piece of sober eighteenth century architecture by Adam (the father of Robert Adam), the return wings at the sides, with a colonnaded loggia, having been added subsequently by John Smith good work enough in themselves, but quite out of keeping with the unpretending character of the centre block, which they seem to overweight.

Passing eastwards again in front of the Art Gallery, we arrive at the end of Upper Kirk-gate, one of the old narrow streets of the town, ascending which we come on the finest modern piece of architecture in Aberdeen, and one of the finest in the kingdom, the Marischal College as in process of being remodelled by Mr. Mackenzie. The Marischal College originally was a building in a weak Late Gothic style, occupying three sides of a quadrangle, with a tower in the centre of one side and a ground floor arcade on each side of the tower. Mr. Mackenzie's scheme, as far as the quadrangle is concerned, has been to entirely remodel the upper portion of the central tower, and to extend the two wings forward to Broad-street, setting them back somewhat from the line of the old part of the wings, so as to keep them wider apart, and planting at the end of each a subordinate but still a large tower in the same style of treatment as the new central tower, and forming a kind of echo to it on a smaller scale. The centre tower, and the left hand extension of the quadrangle with its tower, have now been completed. On one of the lithographs we show a reproduction of a photograph of the upper portion of the central tower as completed; unfortunately the photograph was not a very sharply defined one, and the illustration does not convey fully the brilliant sparkle of the tower as seen on a clear day, with the detail all in bright new granite, but it shows what a fine composition it is. The effect, seen in combination with the lesser tower in front of the return wing, is really splendid, and when the whole scheme is completed it will be one of the finest and most striking architectural conceptions to be seen within the compass of the British Islands. At present, however, the completion of the design in its original form is under debate. The old Greyfriars church stands, unsymmetrically, across the opening of the quadrangle, and the tower on the southern wing cannot be built without removing the church. We presume that when the design was made it was assumed that the church would be removed; now there seems to be a great desire (in which we understand the architect shares) to preserve it. Mr. Mackenzie's elevation, which we reproduce (p. 459), shows how he proposes to solve the difficulty, by breaking the symmetry of the composition and planting the remaining tower further to the right, so as to avoid the church, the side of which is shown in the elevation.* This alteration will unquestionably spoil the effect of the scheme, and the church will in any case shut out a general view of the quadrangle, and stands awkwardly in front of it, not being central with anything. The interior of the church has no interest of any kind but in its historical associations; it has been entirely "churchwardened." The exterior retains its mediæval face for the most part, it is not of the highest value in that sense; we give a sketch of one end of it. Whatever may be one's reluctance to interfere with ancient buildings, it appears at least a question whether the church is of so great value that its retention should be allowed to spoil so fine a conception as the new Marischal College design.

But we have not done with the Marischal

* The small plan in the corner of this elevation will also be useful in explaining the whole scheme.



WEST WINDOW, GREYFRIARS.

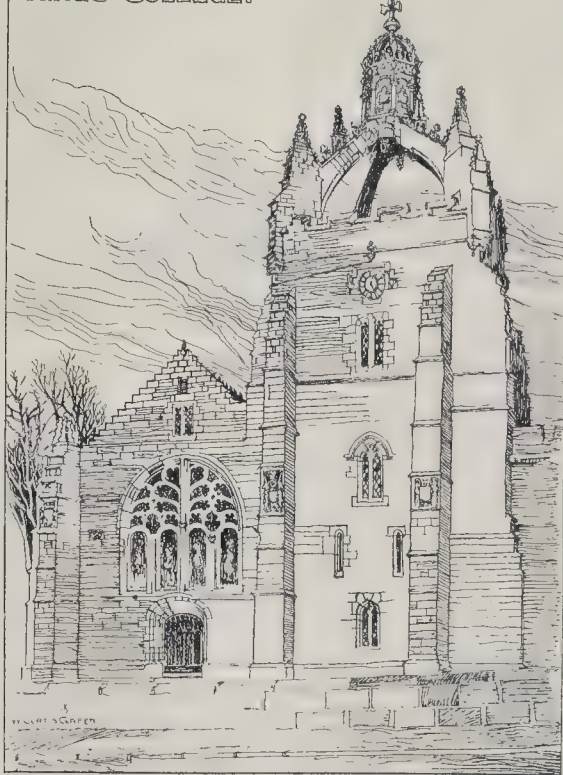
age yet, for at the back, facing towards North-street, is the great mass of King, the Mitchell Hall, added on behind tower and at right angles to the central. The lithograph from Mr. Mackenzie's shows the general appearance of this building, with the central tower rising at the top. As the ground falls low in West North-street, this lofty and very solid mass of building, with its admirably designed and proportioned angle turrets, and the lofty masses and masses of plain wall at the top, is relieved by the row of traceried windows at the top, is seen with all the more effect, and is perhaps in itself the best portion of the new work, only the *coup d'œil* is so effective as in front, where we see two towers in combination.

we are now near the neighbourhood of North-street again, we may go back there to take a new line up King-street, due west. At the commencement of King-street, on the west side, is a rather remarkable range of the old classical granite architecture of Aberdeen, a view of which is given in the lithographs. Starting from the North Bank at the angle, before mentioned, we have the Surgeons Hall, a severe classic building with a colonnade and pediment, granite-fronted houses, and the large massive North Church with its square tower and circular Greek-looking lantern; the whole range by the late John Smith is referred to, the designer of the North-street Screen. Although the details are cold and uninteresting, the whole of the buildings has an impressive appearance, and the façade of the North Church, as seen from the end of North-street, is a fine and striking example in an old-fashioned taste. Further along the road Mr. Clyne's County Hotel is a specimen of simple and characteristic treatment of a granite front. In the neighbourhood of King-street also are to be found the new Fire Brigade Station (Mr. Mackenzie) and a block of lodging houses by Messrs. Marshall & Dick, of Newcastle, a good specimen of simple treatment of a building of this class: of both these we give illustrations. King-street brings us usually to King's College, properly speaking to Old Aberdeen, but the chapel, which, with its thickset boldly designed and "crown" roof, is the best piece of mediæval work in Aberdeen. We give a sketch of the tower and west end of the chapel, the interior of which is chiefly remarkable for the splendid carved woodwork over the stalls, of the date of about 1505 (is the precise assigned date), in which work panels between mimic buttresses, of panel of different design. We give also a sketch of the lead *fêche* and the head of the buttresses (p. 462), with its sundial



Lodging House near King-street. (Messrs. Marshall & Dick, Newcastle.)

KING'S COLLEGE.

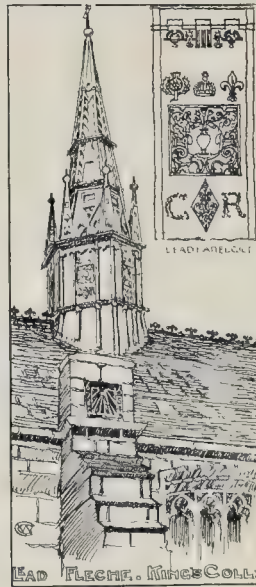


The decoration of the chapel, carried out a few years ago by Dr. Rowand Anderson, is a little too much of the stencilled pattern order, and hardly seems in keeping with the ancient work. On the way back, a little west of King-street, we may see on an eminence the exceedingly characteristic octagonal chapel of the sisterhood of St. Margaret (see p. 462), looking at a distance much more like a piece of mediæval than modern work, and which

from its elevated position is a conspicuous object for a considerable distance round.

On the south side of Union-street and Castle-street we get into the region of the old mercantile and shipping quarter of Aberdeen. The market, facing towards Market-street, has a rather bold though perfectly plain granite front (see sketch). On the principal quay bounding the docks is the Custom House, a seventeenth century building; we give a sketch of the entrance doorway with its plain pediment and keystone. Along the Dee, to the south of the Docks, runs the road called The Esplanade, which however has none of the character which goes with such a name at a watering-place, but it is merely a banked-up and rather dreary-looking road skirting the river. Coming back to the Market-street quarter, we may notice the narrow steep winding lane called Ship-row as a characteristic specimen of the older streets, flanked by grim and dirty but solid-looking small stone or granite houses. Behind the market, westward of it, is the stone-paved open space still called "The Green," though every trace of green has long ago fled from it; but in the middle of it is a very curious old fountain (see p. 463), a square erection with an oggee roof, grotesque masks at the angles, and a rather pretty statue of a boy on the top. In this quarter too, oddly enough, and near The Green, is what is reckoned the principal hotel in Aberdeen, the Imperial, the foundation of which dates from a good while back, and which still keeps its reputation, though a more unpromising position for a first-class hotel, in a narrow street in the lower part of the town, could hardly be imagined. Probably it was founded at a time when the position was reckoned a better and more central one than it is now. It has been enlarged and modernised, but the modern front presents nothing of architectural interest or attraction. The oldest street houses in the town, or some of them, are to be found in the long, narrow, and evil-smelling street called the Gallowgate, running northwards from the end of Upper Kirk-gate. Here we can probably see examples of what were the dwelling-houses of Aberdeen some two hundred years ago; low but very solidly built granite walls with square windows; and in one part of the street is an old Jacobean arched gateway with rusticated pilasters, which now leads into a deserted open space at the back of a church, but has very much the appearance of having been formerly a gate into the courtyard of a house, somewhat like those which give access to the courtyards of houses in Paris. Then, in Netherkirkgate, a little way to the south, and amid some narrow lanes, is one of the curiosities of Aberdeen; a small round tower with a flatly carved figure of an armed man in a niche, and a coat of arms in a panel on the other side. The statue is of course said to represent Wallace, though this is rather doubtful. It was in Netherkirkgate that one of the old "ports" or town gateways was formerly situated; possibly this tower was a flanking tower to the gateway. At all events it is a curious object, rather difficult to find (we stumbled on it quite by accident), but one which a visitor should not omit to see. Among the objects of interest in the shape of old remains we give sketches of a house in Ship-row, an interesting old house called the Victoria Lodging-house, near the Gallowgate, and some old lead spoutheads and ornaments, of which there are some curious and interesting examples in the town.

We have devoted one sheet of our lithographs to illustrations of various churches, in addition to those already mentioned. On the whole, churches are not the strong point of Aberdeen architecture. All those represented on the lithograph are modern and comparatively new ones, except the Free High Church, which is in fact two churches, the portion shown in the foreground of the view being the Free High Church, the portion on the further side of the tower

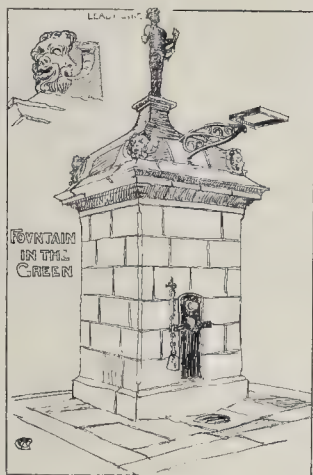




The Dee Bridge.

Free East Church. The interesting in the building is the brick spire (designed by A. Simpson); not only tower and spire, in spite of bad are very pleasing in general line and proportion, but because the spire is a capital piece of brickwork; again, what we have observed as a meritorious tendency to good workmanship noticeable in Aberdeen. Most ambitious of the new churches is St. John's Cross Free Church, a West-end of which we regret that we had not a photograph, for though all the is is not what we should admire, it is a very spirited attempt at originality in the treatment of a granite building, is an exceedingly powerful appearance, is a battering ground story to the tower, long accentuation of the angles, and a heavy corbelled-out balcony above. It is admitted that the details do not altogether very well; the short thick columns with rather French Gothic capitals on the west entrance are in appearance and seem to belong to the building, and it was a great deal to mount the upper part of the on small columns with no other connection with the substructure; the result is then seen against the sunlight the portion looks quite cut off from the rest. Close to it (not illustrated) is an ancient stone church of rather French detail, somewhat too exuberant, but which has a good outline and groups with the rest. There seems a tendency in Aberdeen to make church towers somewhat lean and thin in proportion, a fault is apparent both in the Holburn Free Church and the Carden-place U.P. Church, which will be the same with the St. James's Free Church at the top of Union-street, where ever gets finished. The church of St. Peter's, by Messrs. Kinross & Tait, of which a small illustration is in this series of the best of modern churches, since it shows a feeling for Gothic work; it is not yet completed. It is built of granite with free-dressings and tracery. In general, it is said that Gothic churches in Aberdeen are not very good; the local taste seems to be more in sympathy with the forms. There is a large church of which we should call the Rickman date of Gothic on the south side of Union-street and up Hunter-street (out of Union-street) is the Roman Catholic Cathedral, a very poor affair, with weak fluted columns and a thin and starved tower and

best residences of the town are in the place and Queen's-road; wide roads, which the latter runs to the extreme west of the city, and indeed at the western end of the road the houses are still in course of construction. It is only here, among the houses, that we find a little of character and originality in the residential architecture; the houses in this quarter are what are comfortable residences, no doubt, but little interest or character in architectural treatment.



Aberdeen can boast of two great advantages in her surroundings; a fine sea beach, extending from the docks to the mouth of the Don, and a most beautiful wide rapid river in the Dee, above the tidal portion. On the beach is a bathing station, where also a very large salt-water swimming bath is now in course of construction. The Dee is easily reached by the tramway to Dee Bridge, which is in itself a beautiful bridge, and may reckon among the architectural attractions of the neighbourhood (see sketch). The arches are formed with nine chamfered ribs or groins with the wall face deeply recessed between them, giving a fine and powerful effect of light and shade. The bridge dates from the sixteenth century, but it has been very largely refaced and restored, and in 1842 was widened; so that it has not the interest of an untouched structure. The original design, however, seems to have been in no way interfered with, and it is still a very fine and picturesque structure, which has not lost under modern repairs all the appearance of antiquity.

We may sum up with the conclusion, for which we think we have shown evidence to carry our readers with us, that Aberdeen is a town possessed of a great deal of architectural interest and vitality. If it cannot be compared with some of our largest cities, it may be pretty safely said that there is no town in the kingdom of the same size in which so many fine buildings can be found.*

SOUTHEAST-ON-SEA COMPETITION. — Mr. F. T. Baggeley writes that the design marked U, which was attributed to Mr. Mountford in the review of this competition in our last issue, appears from the description to be his design. Mr. Mountford, we have since ascertained, was not a competitor.

* This series of illustrated articles was begun in our issue of September 26, 1896. A list of those towns already dealt with, and particulars of future arrangements, will be found on page 1.

NOTES.

We think it is to be regretted that the House of Commons last week threw out the Bill of the London County Council for the construction of a tramway over Westminster Bridge and along the Embankment to Blackfriars. We cannot doubt that such a tramway would be a great public convenience. Westminster Bridge and the Embankment are so broad that a tramway would be less inconvenient to vehicular traffic than in narrower streets. The objection that a tramway would disfigure the Embankment is absurd; it would be as reasonable to object to covered vans and costermongers' carts. The Bill was in truth thrown out partly by those who would keep the streets of London for those who ride in carriages and cabs, and partly by those who have an old-fashioned prejudice against tramways in streets. We quite admit that tramcars so large or so alarming to horses as some of those to be seen on the continent should not be allowed. This was a matter which could have been settled in committee, and did not justify the throwing out of the Bill on its second reading.

THE arbitrator's award in the case of the Corporation of Manchester v. Perkins, Graham & Co., to which we referred briefly in a Note in our issue of April 16 (page 367), is a judgment in favour of the plaintiffs as far as the main point is concerned, that of making the contractors responsible for the cost incurred in doing a great part of the work over again. The contractors are specifically exonerated from any charge of fraud except in so far as they were technically liable for the dishonest conduct of their workmen; but Mr. Perkins, the head of the firm, who had the work in hand, does not escape the charge of negligence in not finding out and preventing the scamping of the work by the workmen. It appeared to us that some of the evidence suggested something more than negligence, and that the judgment is rather more favourable to Mr. Perkins than might have been expected from the evidence. What are we to make of this statement of the bricklayer Dean?

"Did he [Mr. Perkins] not say that he had looked after you for a long time, and that you ought to look after him a bit?—Yes; but that was referring to some bad blue bricks that I was told to get up early in the morning to use.

Those were bricks that had been condemned, were they not?—Yes.

And did you get up early and use them?—Yes.

Did you not say also that the fallman at the top of the shaft gave you a signal when the inspector was coming?—Yes, so that in a short time we could run up a course of red brick round the blue for the inspector to see."

The latter answer does not inculpate the contractors, it only shows what a barefaced system of deceit was going on under their very noses. But the first question and answer amounts to a charge by the witness that his employer was in collusion with him, and it is rather strange that in Mr. Perkins's evidence some days afterwards no reference was made to this. It may be difficult to apportion the blame exactly between the contractors and their workmen, but it is evident there is a great deal to be shared between them, and that it has been a very discreditable affair.

Representations as to Sanitary State of Houses. THE case of *Burrell v. Brown*, which was decided last week, will, we hope, be a warning to house owners against making reckless representations as to the sanitary state of houses. The plaintiff stated in evidence, and was supported by several witnesses, that the defendant was asked if the sanitary state of the house was good, and he said that it was. It proved to be quite the reverse, and judgment was therefore given against him. The result is that the defendant is now in a worse position than if he had either put the drains into a good condition before he sought for a tenant, or had frankly said that they required work done upon them. We fear that there always will be money-grabbing house owners who will endeavour to let their premises without putting them into proper order. We must point out, however, that the plaintiff in the present instance was in some senses fortunate; for, as we have over and over again said, every prudent purchaser or tenant will always have premises examined, and not trust to mere representations. An examination by a competent person is the only safe course.

The Charley Bazaar Monument, Paris. M. GUIBERT, the architect commissioned to carry out the monumental building on the site of the dreadful fire in Paris last year, has commenced the work on the ground. The designs show a square form of plan, slightly recessed from the street line of Rue Goujon, with a façade of something over 60 ft. in width. The building will have a podium with doors at each side giving access to the living rooms, on the ground floor, of the Sisters who will have charge of the building. The main building will include a portico with an arched entrance flanked by columns, and approached by a flight of steps. Above will be a pediment with a commemorative shield or cartouche supported by allegorical figures; a cross surmounting the whole. The chapel itself will be circular, with porticos on each face and roofed with a dome crowned by a statue of Faith. In the interior a colonnade of eight columns will carry the base of the dome. To right and left will be two side chapels in which will be engraved the names of the victims of the catastrophe. In the rear of the building will be a garden surrounded by an arcaded cloister, with a vaulted crypt under it. The total cost will be about a million francs. The monument is all very well, but one cannot help reflecting that the expenditure of a comparatively small proportion of that sum on the original bazaar building would have been sufficient to render it secure from sudden conflagration, and thus to have avoided the catastrophe.

Glasgow International Exhibition Competition. If the terms of the competition for the building for the Glasgow International Exhibition are correctly stated in the advertisement of the Council of the Exhibition, which appears in our advertising columns this week, we think they will have to revise it if they want any architects of standing to compete. The premiums offered are liberal enough, and it is stated that the architect whose design is placed first in order of merit by the Executive Council will be employed to carry out the building "unless some obstacle (of which the Executive Council shall be sole judge) prevents such employment." This we take

to be only a safe-guarding clause for exceptional circumstances. But the next announcement is that the architect chosen will be paid a commission of three per cent. on the cost of the building, "which commission shall include the premium to which he may be entitled." As we have often pointed out, even with the ordinary commission of 5 per cent. the premium ought never to be merged in the commission, as it generally barely remunerates a competing architect for making the competition design; but here three per cent. is offered as the commission. The "3" is given as a numeral and not as a word, and therefore it is just possible it may be a mistake for "5;" but if not, it is no use the Council expecting that any architect of good standing will compete, and they had better alter it at once. Nothing is said of an assessor; possibly in this case the Executive Council includes artists and architects; in that case there is no need for a professional assessor; but that point also needs explanation, as well as the "3 per cent."

Architects Touting for Commissions. THE Hon. Secretary of the Leicester Society of Architects sends us the following circular letter, which had been received by a solicitor practising in Leicester, and forwarded by him to the Leicester Society of Architects:—"RE ESTATES, ECCLESIASTICAL, PUBLIC, OR RESIDENTIAL BUILDINGS, WAREHOUSE AND BUSINESS PREMISES, VILLAS, FARM BUILDINGS, &c. SIR,—Believing that you have at times, either directly or within your influence, work requiring the services of an architect and surveyor, I should esteem it a favour if you would afford me, when the opportunity occurs, a preliminary consultation thereon. From my experience of over thirty years in all branches of the profession, and from my having carried out most varied and important works (see annexed list), I am able to guarantee that all building, surveying, or other work entrusted to my care, shall be carried out with close personal attention to all details, at a minimum of cost, with sound work, and avoidance of extras; and in all cases with the best design."

We will not assist the writer's advertisement by giving his name, but he dates from an address in London. This seems about as gross a case as we have ever come across. To add the last touch to it there is the following postscript:—

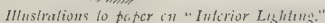
"P.S.—For introduction of business I shall be happy to pay 20 per cent. of my commission as soon as received."

Electric Light Fuses. THE paper read by Mr. Andrews to the Institution of Electrical Engineers on the 5th inst. dealt with "The Prevention of Interruptions to Electricity Supply." There were many excellent things in this paper which will be appreciated by electricians. We may mention a highly ingenious magnetic cut-out, designed by the author, which can tell whether an alternator is running as a motor or a generator, and in the former case promptly cuts it out of the circuit. This device ought to prove useful wherever alternators are being run in parallel, as it is preferable to the ordinary fuse. His method also of arranging a duplicate set of mains to sub-stations and putting his magnetic cut-outs in the circuits reduces the danger to be apprehended from burst water pipes, gas explosions, pick-holes, &c., to a minimum. Mr. Andrews, who is engineer to the Hastings Company, has

found that underground substations are a source of constant worry and anxiety, and so he has abandoned them in favour of those above ground. We are sorry to differ entirely from Mr. Andrews on the question of the size of the main fuses in consumers' houses. As we pointed out some months ago, when the question of increasing the size of the main fuses was first seriously discussed by electrical engineers, the remedy is not to double their size and thereby increase the fire risk, but simply to insist on proper clip fuses being used. It would be well if central station engineers remembered that their clients are easily frightened, and that they are not accustomed to the smell of hot insulating material or getting burnt from the over-heating of their metal switches.

Mr. Mark Fisher's Exhibition. It is a pleasure to study a small group of pictures by a landscape-painter who really has a style, which is what can be said of Mr. Mark Fisher more decisively than perhaps any other English landscape-painter of the day. His work is somewhat restricted in range, but he has a system and a definite aim, and his art has a good deal of affinity with that of some of the best French landscape-artists of the day, in its broad method and absence of mere realism. Some of his pictures at present on view at 14, Broad street exemplify Mr. Fisher's best quality as a landscape-painter, and all have something in them worth attention and study. The three finest are perhaps the small one entitled "A Shady Spot" (2), a landscape with cattle scene; the large one under the title "The Farm Pond" (12), and the one next under the title "Autumn" (10). In the last named the main elements are the same: water seen in the foreground under the shade of trees through which broken light glances, and a brightly lighted distance in the middle distance beyond. In "Autumn" the ripple and coolness of the water are beautifully conveyed. In "The Farm Pond" we learn an incident of the picture; and it is worth while to notice how Mr. Fisher treats cattle, conveying the form and character of the colouring of the animals without separating them from the total effect of the composition. The bright effect of the sunlit bank beyond is also an admirable incident; but no incident interferes with the conception as a whole. The same with the ducks in the picture of "Autumn"; they are not (in the words of the Royal Academy regulations) "mere transcripts of objects of Natural History;" their forms are sufficiently defined (for people who do not want to look at pictures with their eyes only to the canvas), but their essential object is to form lights in the shadowed portion of the picture, and to enhance the effect of the rippling blue water. Among others of his exhibits we may mention "Algiers" (1), "Mustapha Superior" (8), "A Breezy Day" (1), "Cows" (5), and "Summer Evening" (28), one of the larger works. The room is unfortunately too small to show paintings of this type to the best advantage; they require a certain space and distance; but the collection is well worth a visit. It will be open to the end of the present month.

The late Gustave Moreau. THE terms of the will of the eminent painter Moreau not yet published, but it is understood that he has left to the State house in the Rue la Rochefoucault, with



A useful rule for the size of windows is, that

not less than one square foot for every 85 ft. of cubic space, and not less than one square foot for each lineal foot between the window and opposite wall inside should be given. Of course, all such rules would be varied by circumstances, as to whether on the ground, first, or any other floor, and also from what direction the light can be obtained. And generally the height of a window may be half the depth of a room less 2 ft., and the width of a window one-third the width of a room. Good, pleasant daylight is of the first importance, and there is a general difference of opinion as to the proper aspect for this. Some hold that only the north light is good, while others that no building is well planned that is not so arranged that there is a little sun in each room during a part of the day. The latter opinion is certainly the best; and, although this is a difficult problem when the irregularity of the streets and frontages in most towns, and the height of adjacent buildings near are so very variable, under all circumstances it is better to lay down what is the best direction for the daylight to reach the windows on any site, and this of course can be more readily arranged on a fairly rectangular site.

The first point to decide is the best axis for the open areas or well openings. Take the average day, and suppose the sun rises at six (see diagram, p. 465), 6 E. will equal 6 a.m., and 6 W. will be 6 p.m. The usual hours of business are, say, from 9 to 5, and then the angle, 509, if bisected, will divide the hours of sunlight equally, and it is this line which should rule the direction of the greater length that open areas and well holes should have. This will be found to be 15 deg. east of north. The open area or court should be made rectangular, not square, and lengthways, north and south. If the line O O be taken as 15 deg. east of north, a well hole should be formed as A B C D. A portion of sunlight (every day that the sun is visible at all) would go into all the windows in the walls, A B, B C, C D, during each day, and in some seasons reach the bottom of the well hole, and, at any rate, it would reach the maximum distance at all times.

If you have followed this proposition carefully you will at once see that if in any town the roads have this direction of 15 deg. east of north, and the cross roads at right angles to them, then will be a great advantage. This is not often to be gained, but it has been noted that this happens to be near the prevailing direction in New York City, and the advantage must be considerable, although it will not be apparent to many.

Following up the proposition of the proper axis for open areas for obtaining the best and most useful daylight to buildings, I have taken the two sets of drawings and following remarks from the *Architectural Record*, December, 1893, and June, 1894.

The conditions for a successful building for use as offices are:—

- I. Ease of access.
- II. Good light.
- III. Good service.
- IV. Pleasing environment and approaches.
- V. Maximum rentable area consistent with economy.
- VI. Ease of rearrangement to suit tenants.
- VII. Minimum cost with true economy.

The plans A and A show two buildings as erected, and B and B B as it is suggested they should be.

For good light, experience confirms the statement that courts should have their long axis north and south. In the plan A it will be seen that the court is of irregular shape, but with the long axis east and west, and while the court area embraces 150 square ft. more than in the plan B (as we say it should be) yet its service in lightings is decidedly less. The rentable area in B is apparent, and the fact that it is possible to have fourteen different tenants on each floor, instead of five as in A, is a consideration which would enhance the value of the building, if erected as suggested. The arrangement in the plan B gives an area of 220 square ft., or about 10 per cent. more than in A. The other illustrations in comparison are made on the drawings A A and B B.

As to the arrangement for good light, it is generally accepted that the requirement is that every portion of the office should be within 20 to 25 ft. of a window, and that that window should not open directly to the south. It is to be hoped that the disadvantages due to the direct south light to an office will soon be appreciated, and the advantage of a court or

open area, with its long axis north and south, more fully understood. Offices, on a bright day, facing to the south have to have the blinds partially closed in order to reduce the glare from the sun, the consequence being the back portion of the office has to be lighted, possibly by gas or other means. The corridors in the plan B B, as suggested, would be sufficiently light with glass in the doors, and fanlights over.

The comparison of these two sets of plans, showing buildings as erected and suggested, are presented as having a considerable bearing on the matter under discussion, and is also a subject which architects in particular are so greatly interested.

Upon valuable sites where the amount of available daylight is very limited, it is necessary that the least possible space be appropriated as mere open areas for light. To show the difference of opinions on this matter, Mr. Boulton, of Liverpool, compiled the accompanying table, which speaks for itself, comparing the different areas so appropriated in five different competitive drawings submitted for the new Stock Exchange, Liverpool, about fifteen years since.

The plot was 49 ft. to Dale-street, depth 197 ft., back width 36 ft., and the total area 9,195 ft., the only street outlet being Dale-street.

COMPARISON OF SPACE SACRIFICED FOR LIGHT.

Designs.	Basement.	Ground Floor.	First Floor.	Second Floor.
Argus	321 ft. 1 in 28'4	570 ft. 1 in 16'0	1,030 ft. 1 in 8'0	1,950 ft. 1 in 4'7
Grand Trunks	None.	4,121 ft. 1 in 2'2	4,121 ft. 1 in 2'2	4,121 ft. 1 in 2'2
Shamrock	45 ft. 1 in 20'4	260 ft. 1 in 15'1	1,822 ft. 1 in 5'0	3,097 ft. 1 in 3'0
Coupon	None.	590 ft. 1 in 21'5	2,283 ft. 1 in 4'0	2,213 ft. 1 in 4'0
1877	None.	1,186 ft. 1 in 7'5	1,380 ft. 1 in 6'6	2,859 ft. 1 in 3'4

It may also be useful to compare the rent-producing area shown:—

RATIO OF SPACE YIELDING RENT TO THE WHOLE AREA OF SITE.

Designs.	Basement.	Ground Floor.	First Floor.	Second Floor.
Argus	1 in 3'9	1 in 2'3	1 in 2'8	1 in 2'4
Grand Trunks	1 in 1'6	1 in 1'6	1 in 2'3	1 in 1'7
Shamrock	1 in 2'4	1 in 3'0	1 in 1'9	1 in 2'6
Coupon	1 in 1'7	1 in 2'3	1 in 1'7	1 in 2'3
1877	1 in 1'9	1 in 2'9	1 in 1'6	1 in 1'5

Notwithstanding the proper arrangement of well-holes and light openings in the lower floors, it is necessary often to assist the daylight by reflectors. These are so generally known, and their good effect so considerable, that it is only advisable to point out that where possible the reflectors should be fixed at the sill instead of half-way up the window, and be exposed directly under the sky, and the light should be thrown up to the ceiling of the apartment, and if this is polished in hard plaster it will greatly assist to distribute the light throughout the room. Where volume of light is required direct, light should be admitted vertically. The light passing through a skylight is very much greater than that through any vertical window, and consequently the light received from the horizontal pavement light is much stronger than from a vertical stall-board.

It is hardly necessary to dwell on the difference of reflection and refraction, but it should not be overlooked. All rays of light move in straight lines, and when they strike upon any object they glance off its surface are wholly or partially absorbed, or pass through the object as in a sheet of glass or a body of water. In the first place, the light is said to be reflected, and in the others refracted, because its course is partially diverted from the right line in which it left the luminous body, and its direction bent or broken back according to the difference in density between the two media. A common illustration of this is the contortion of a stick partially immersed in water, or a coin placed at the bottom of a bowl, so that it is partially seen over the edge, and when the bowl is filled up with water the coin will come into full view from the same point.

The direction in which light is reflected depends upon that from which it proceeds; it is always such that a perpendicular to the surface at the place of impact bisects the angle formed by the arrival and departure of the ray. Each half of the angle represents the angle of incidence or the angle of reflection; those angles are always equal, and always in the same plane, one being known, the other is readily ascertained.

The perpendicular is termed the axis of incidence, the first ray the incident ray, the other the reflected ray. It is by the reflection of the rays impinging upon them that objects become

visible, and the reflective powers of the objects are very variable. At a perpendicular incidence, water reflects only eighteen rays out of every 1,000, and glass only twenty-five, while Mercury reflects 666. When the rays strike the surface obliquely, the reflection is augmented; at an incidence of 40 deg. water reflects twenty-two rays, at 60 deg. sixty-five rays, at 80 deg. 333 rays; while at an incidence of 89½ deg., where the light almost grazes the surface, it reflects 721 rays out of every 1,000.

Thus, as the obliquity increases, the reflection of water approaches and finally overtakes the reflection from mercury, but at no incidence, however great, is the reflection from water, mercury, or any other substance total.

Any beam of light meeting any refracting surface obliquely, it is obvious that one part of the beam will meet it before another; it is thus hindered in its motion by it as wind is hindered, but not stopped, by the trees. Trace a ray A B (fig. 41) to the refracting surface C D, marking off the assumed length of its waves by the transverse lines. The front will be retarded at E before it is retarded at F, and we may assume the retardation is such that the wave in the denser medium is only propagated to G, while in the rarer medium it reaches H. It is plain that the beam must swing round, but when the side F also reaches the denser medium at H, the whole will be

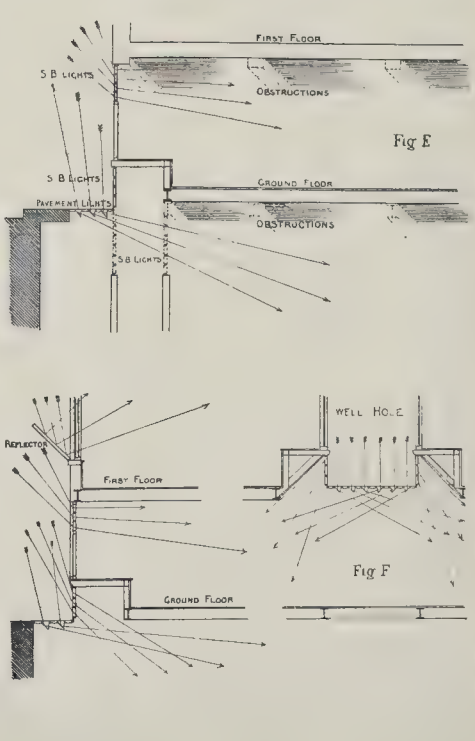
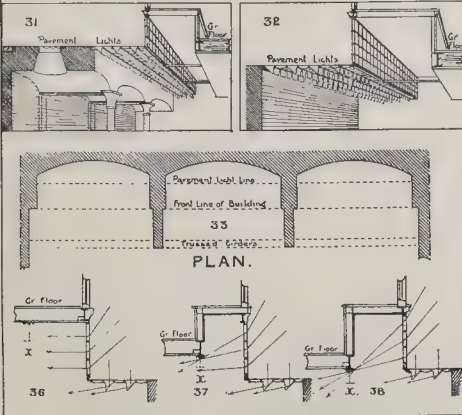
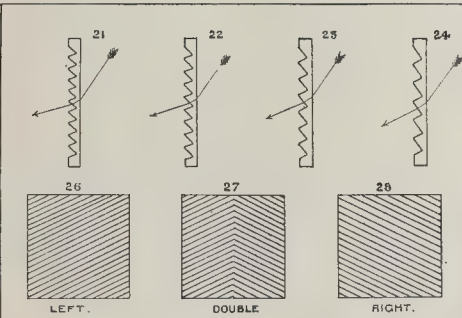
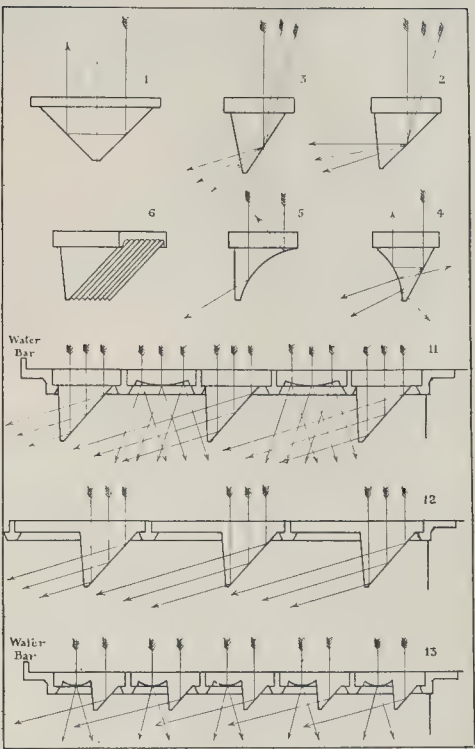
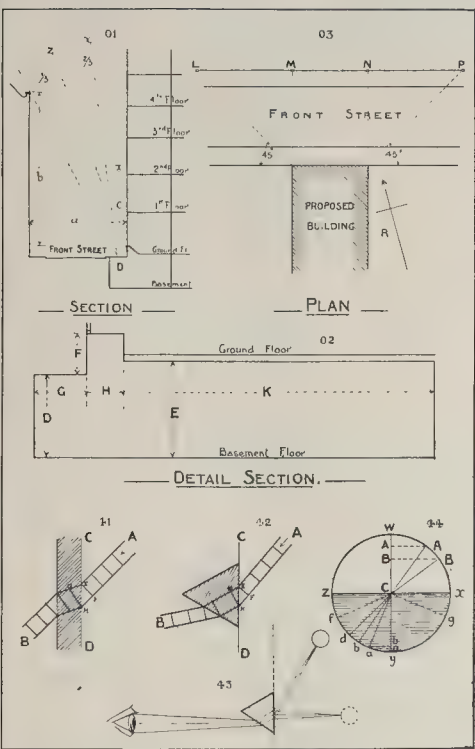
retarded alike, and the beam will proceed as before, only slower and in a different direction. As the beam emerges from the denser medium, the reverse of what has been described occurs, and, provided the refracting medium is of uniform density and thickness, the beam of light proceeds in a path parallel with its former course. In lenses and prisms the emergent beam takes an oblique path, and in the case of lenses either convergent or divergent (according to the kind of lens), and the position of the lens relative to the object.

In fig. 42 the upper side of the beam of light is still further retarded, and therefore the beam must swing round again and pass out in quite a different direction to that of entry, so that a beam of light passing through a prism is permanently deflected. For example (fig. 43), the sun viewed through a prism, as shown, will appear to the observer in a lower position; the light in this case is twice refracted—once on entering the glass and again on leaving it.

The principle on which the measurements of refraction are based was discovered by Willebrod Snell, and is explained as follows:—

Let W X Y Z (fig. 44) represent the outline of a circular vessel containing water, and X Z the surface of the water. When the ray is incident along W C, perpendicular to X Z, it is not refracted, but reflected on the same line; when it is incident along A C, it is refracted at C, and strikes the circle at a; when it is incident at B C, it is refracted to b. From the ends of the incident rays let A A and B B be drawn perpendicular upon W Y, and from the ends of the refracted beams let the perpendiculars a a and b b be drawn. Measure the lengths of A A and a a, and divide the one by the other, and there is a certain quotient. Divide B B by b b and they give the same quotient—that is the ratio between the sines of the angles of incident, and the sines of the angles of refraction is constant. Snell found this quotient to be a constant quantity for each particular substance, though it varied in amount from substance to substance. He called the quotient the index of refraction. According to Brewster, the index of refraction is—

For glass, two of lead to one of flint	1'830
Plate glass.....from 1'514 to 1'542	
Crown glass.....from 1'525 to 1'534	
Water.....	1'336



Illustrations to Paper on "Interior Lighting."

In comparing the lenses used in pavement lights I assume the index to be 1.5; therefore the angle of refraction, on entering glass from the atmosphere, is two-thirds of the angle of incidence, and on leaving the glass it is half as large again.

Referring now to the lenses and prisms that are most useful in pavement lights and stall boards, shop fronts, offices, windows, &c., the first kind of glass probably used in decks or floors was undoubtedly the common "ship's deck light," which is a solid mass of glass with a flange all round to support it in the adjoining floor, and with a heavy drop or triangular wedge on the under side. Whether this drop was originally intended for strength, or for increasing and distributing the light, is doubtful; there is no doubt about the strength, but if you look at the lens on the diagram (fig. 1) it will be seen that all the vertical rays are reflected outward again from the sloping faces on either side.

We now take practically the same block of glass (which for our purpose is cut in two) and open it outwards, and you will at once see the marvellous result, and it is this principle which has been the foundation of "Haywards' patent semi-prism pavement lights," figs. 2 and 3. It will be seen that the vertical, or nearly vertical, ray is thrown out through the upright, or nearly upright, front of the lens at an angle a little below the horizontal, and the rays falling on the top of the lens at various angles (fig. 2) are thrown out in a fan shape, and the steeper the back slope, with the nearly upright face a little more inclined (as in fig. 3) projects the light lower than in fig. 2. Of course, such an important result, which can be obtained from a series of prisms grouped in a frame as a pavement-light and protected by a patent, has been attempted by various other devices or sections of lenses, as in figs. 4, 5, 6, and 7. These are lying on the table, and the average result can be got by holding them in the hand and comparing one with the other. The result is generally bad, and that the makers of such lenses should have been given a certain amount of encouragement by architects using them shows to a certain extent the comparative neglect in deciding such an important matter as to which is the best kind of pavement-light for producing the best illuminating effect in any building. It will be seen, too, from sec. 11 that some thought is required in assembling the lenses in a properly-constructed frame, so as to produce a satisfactory result.

Section 12 is an attempted improvement on sec. 11, but unfortunately there is a great difficulty in making such irregular shaped lenses perfect, when one part is so bulky and another so thin, on account of the inequality of the glass and tension in the lens, therefore this lens in practice is a failure. This tension also limits the size that can be safely made.

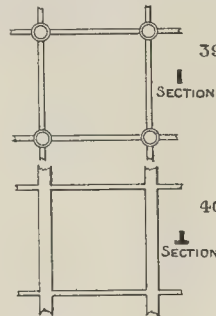
Fig. 13 is a neat arrangement of a small prism in each pocket, and may be often of use when the area of pavement light can be large.

Now, coming to the vertical lights used in stall boards, or applicable to shop fronts, windows, &c. The lenses used are "Haywards' reflecting lens" (as in figs. 21, 22, 23, 24), which are made at different angles to suit different circumstances. Such lenses are usually employed under the shop or office front, and the application is better explained in figs. 36, 37, 38.

In plan fig. 33 and section 31 and 32, the combined arrangement of pavement lights and stall boards will be clearly understood. It should be noted that if any girder be introduced (as shown in dotted lines x, x, x in figs. 36, 37, 38) a very considerable portion of the light would be lost, and a heavy shadow would be cast along the ceiling. Pavement light should be supported by bearers transversely, and as little obstruction or thickness of metal be introduced at the junction of the vertical stall board with the horizontal pavement light, and this is easily arranged by turning up the back edge of flange as shown in secs. 11 and 13, which is generally called a "water bar."

Fifteen years ago Messrs. Hayward Bros. fixed in two fronts of the ground floor premises, used as offices, &c., Haywards' reflecting stall board lights. The result is very effective, and the light often too strong; in fact, it is necessary to place the desks so that the clerks do not face the front light. These lenses can be applied in various other positions, as in lean-to or sloping roofs, &c. The frames of the upright or stall board lights are sometimes made with rebates to the horizontal bars only

or vertical bars only, and in others with a perfectly plain sectional bar without any rebate, with a small button at the intersections to retain the glasses in their position. See figs. 39, 40.



Diagrams E and F are general sections of a basement and front, in which it will be seen that a combination of several devices, as already more or less explained, can be introduced to such an extent, either single or combined, as may be desired. It will be seen that the upper portion of the windows can be glazed with the reflecting stall board lenses, to throw the light to the back portion of the ground floor in almost a horizontal direction, or to throw the light slightly upwards on to the ceiling and thereby illuminate the back portion of the office. In the diagram (E) it will again be seen the great disadvantage of running any transverse girders or beams below the level of the ceiling across the direct line of light, these girders or beams would throw heavy and objectionable shadows, so that the ceiling, instead of being light and bright, would be shadowed and the major portion of the reflected light lost. Under the stall plate stall board lights can be fixed vertically as in the window above, and in the pavement light "Haywards' Semiprism Lenses," fixed horizontally, and these pavement lights could throw the light on to a stall board light, fixed as shown when a partition is advisable to divide off the front part of basement, and this would throw a volume of light into the basement.

In the other sectional drawing F, the ordinary daylight reflector is introduced at window-sill on first floor, and near the middle of the depth in well-hole a series of pavement lights and stall board lights to throw the light all round same are introduced; the arrangement of lenses throwing reverse ways should be noted. It will be seen that one or two of these plans can be adopted with more or less advantage.

Many modifications suggest themselves to architects and others, and with the information called for in diagrams 01, 02, 03, the best arrangement can readily be worked out.

It will be noted that when light is obtained from definite sources, it must be taken to act in some line of greatest volume, and referring to the diagram 01, the best light falling on the pavement light at "D" will be at about one-third of the angle made by the front of the building, and the line of light from the coping of the opposite building, or in the direction "x," and from the stall board lights at about two-thirds, or as direction "z."

Again, if the street is very narrow and a high building directly opposite, the light can be usefully assisted by such lenses as figures 26, 27, and 28.

In all cases, the tops of the lenses of pavement lights and front of stall board lenses should be plain flat surfaces and kept clean. However, ornamental effects can be given, but this is generally done with a proportionate reduction or waste of light. Also, a more ornamental appearance can be given by tile inlays between the lenses of pavement lights, or a good foothold by a non-slipping material, such as lead, cement, facing, &c.

Specimens and samples of such lights are numerous and difficult to show to advantage away from the factory, on account of their weight, and also because they cannot be seen in position.

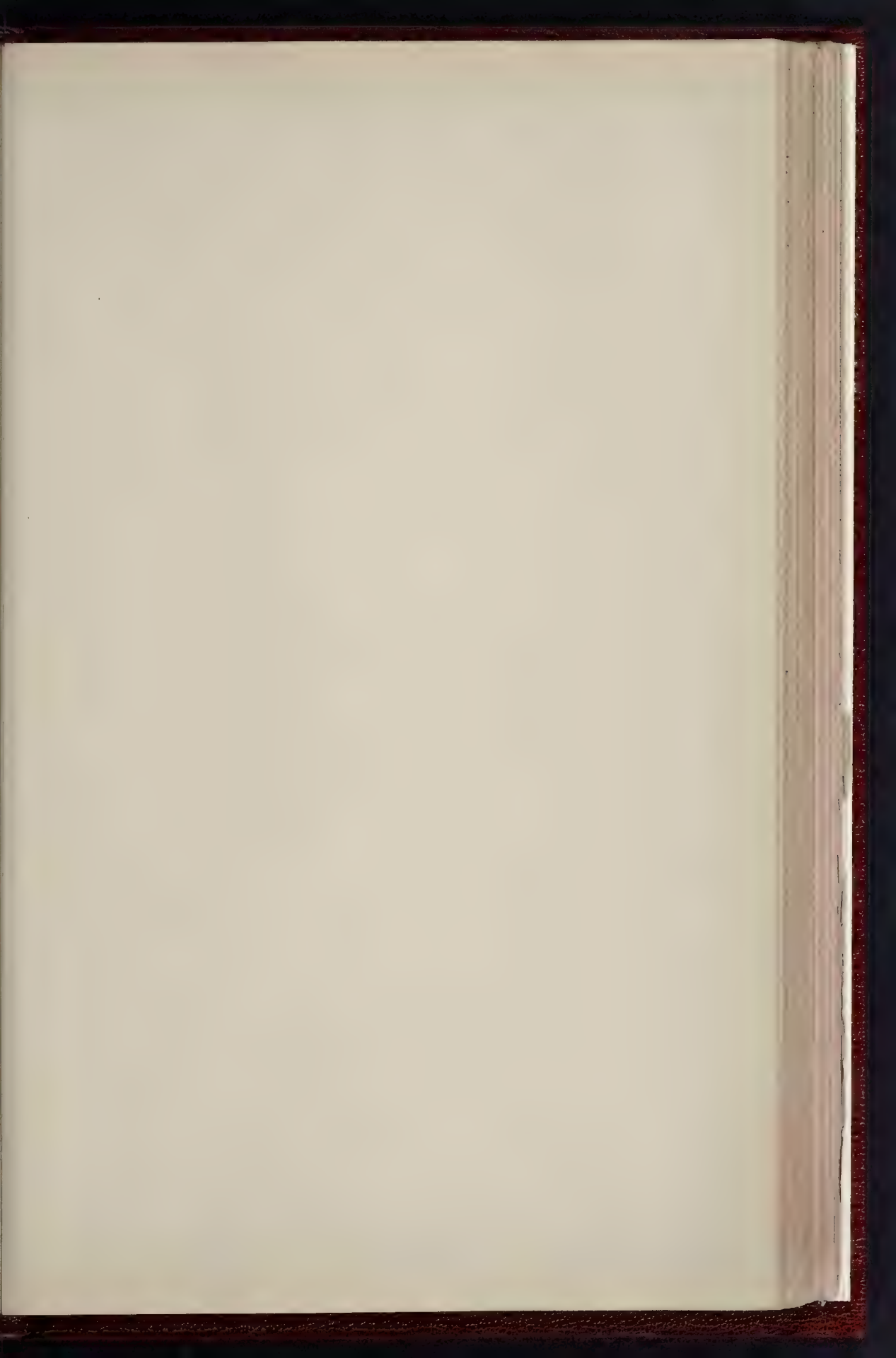
In conclusion, I would add that an effective result can only be produced with the fullest information being supplied, as in the diagrams 01, 02, and 03. They should be carefully

examined, so that every advantage may be taken to fulfil the particular result desired.

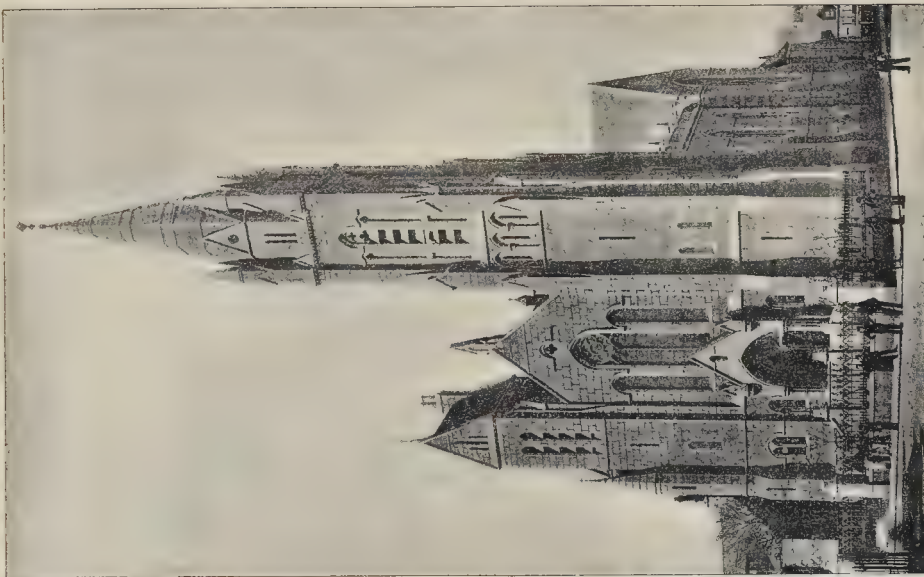
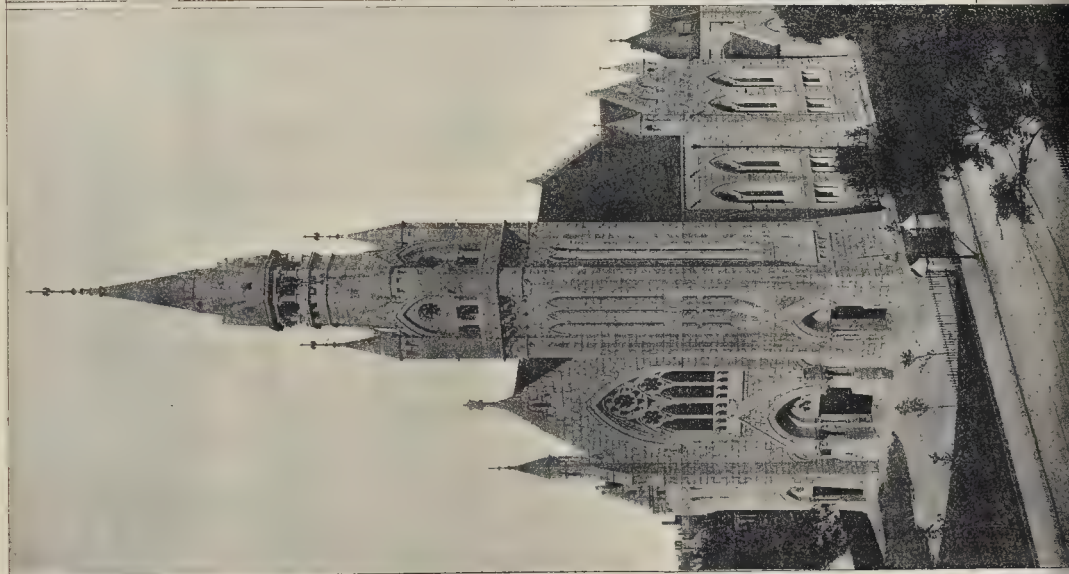
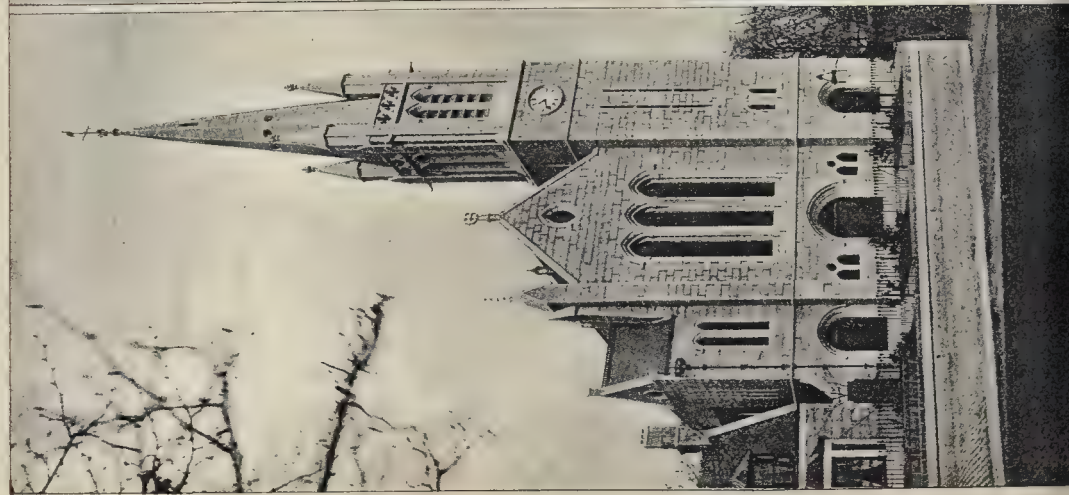
The Chairman, in opening the discussion, said that Mr. Eckstein had suffered under the disadvantage of describing work to prove the utility of which ocular demonstration was needed; and no doubt the author would have preferred to have read his paper in a basement lighted up by the many devices which he had described. The question of reflected light in connexion with lighting was an important one, and there was no doubt that it had not been developed to anything like the extent which was possible. The subject was of special interest to architects practising in large cities like London, and some such method of lighting was of more value in a large town than in the country. It was on account of the value of light in narrow thoroughfares in a large town that reflected lights were used, and it was rather surprising that more had not been done in this direction—not only in providing the light, but in directing and conveying it to different parts. The subject was a scientific one, and a great deal of ingenuity was necessary in order to get the best results from lenses.

In narrow thoroughfares, and in cities particularly, warehouses and places of business were constructed with small areas and shafts for light, and these, as had been seen in the recent great fire, were a source of great danger; and if proper light could be obtained by reflectors such dangerous areas and shafts could be done away with. He had been very much interested in a visit which he had just made to Hill-street, Finsbury, where he saw the use of reflected lights on a scale he had never seen before. Not only was the light brought through the prism, but it was conducted and directed in a remarkable manner. Mr. Eckstein had referred to the question of the vertical stallboard light being made use of to reflect the light either horizontally or at any desired angle in the basement, but at Hill-street, by means of dropped vertical lights, a tremendous lighting power was obtained. It was astonishing the distance that light could be conveyed by reflectors without taking up the floor space which was so valuable in a basement. At Hill-street, where the work was being shown by an American firm, the Luxfer Prism Company, prisms similar to those which Mr. Eckstein had shown were to be seen, but there were others which were an improvement. The company claimed another advantage for their lights; they could not only be used in the basement, but on other floors, &c. These were matters of a practical character. The system had been carried out to a large extent in Chicago, where reflected light was used in a way that English people would be surprised at. For instance, reflectors were used in such a way as to form a canopy. The material which the Americans used was a clear and permanent one, whereas silvered reflectors, used in this country, soon got dirty and cracked. The Americans also fitted the squares of glass together by a process of electro-glazing, which did away with the usual framework, which was an obstruction to the light; the result was practically one sheet of glass, and there was undoubtedly a great future for this wonderful process.

Mr. Banister F. Fletcher, in proposing a vote of thanks to the lecturer, said that the paper had really amounted, to a large extent, to a somewhat practical treatment of the law of optics as affecting architecture, and it was of special importance to an architect whose practice was in a city where every available inch of light was necessary. The lecturer had said that a useful rule for the size of windows was not less than 1 sq. foot for every 85 ft. of cubic space, and not less than 1 sq. ft. for each lineal foot between the window and the opposite wall inside. That seemed a larger percentage than Gwilt allowed, but no doubt it errs on the side of light. The lecturer also exhibited two plans of buildings where two methods of giving light were adopted. He, the speaker, could not agree that the scheme which had been suggested was better than the one carried out. In the suggested scheme the area was shown north and south; that was an excellent way where it could be done, but in practice they had to deal with the areas as best they could, and when they had two rather fine streets, as in the case in point—the building at Chicago—and light practically more than half the rooms from an internal court when they could be lighted from a wide street was not the sort of thing any architect would do. It seemed to



THE BUILDER, MAY 14, 1898.



UNITED PRESBYTERIAN CHURCH, CARDEN PLACE
(MESSRS. ELLIS & WILSON).

FREE HOLBURN CHURCH (Messrs. Brown & Watt).

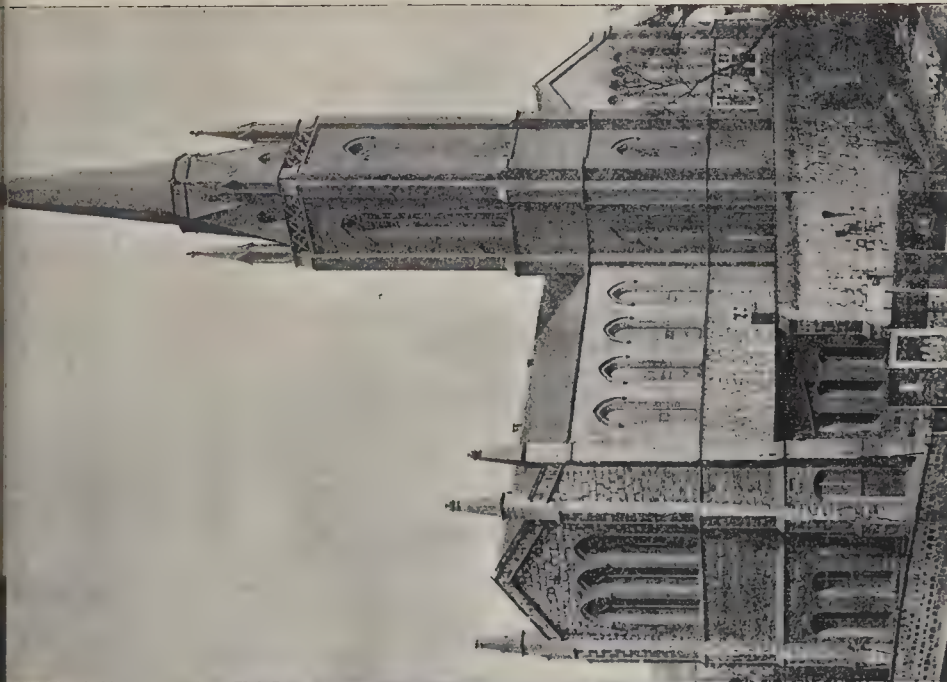


ST PETER'S (Messrs Kinnross & TARBOLTON)

QUEEN'S CROSS, FREE CHURCH (Messrs. Pirie & Clyde).

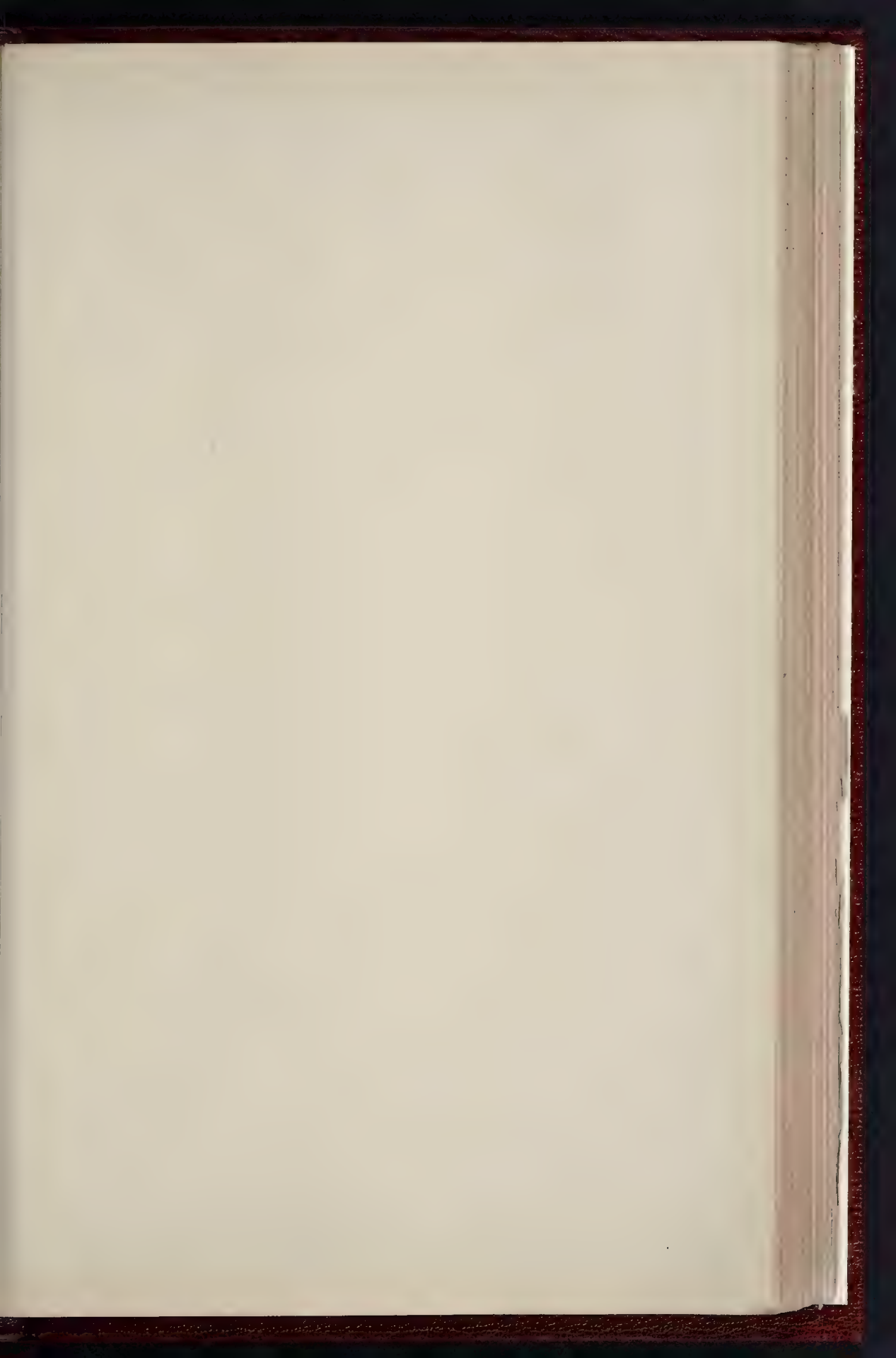


ST JAMES'S EPISCOPAL CHURCH (MR A CLARKE)



FREE HIGH CHURCH

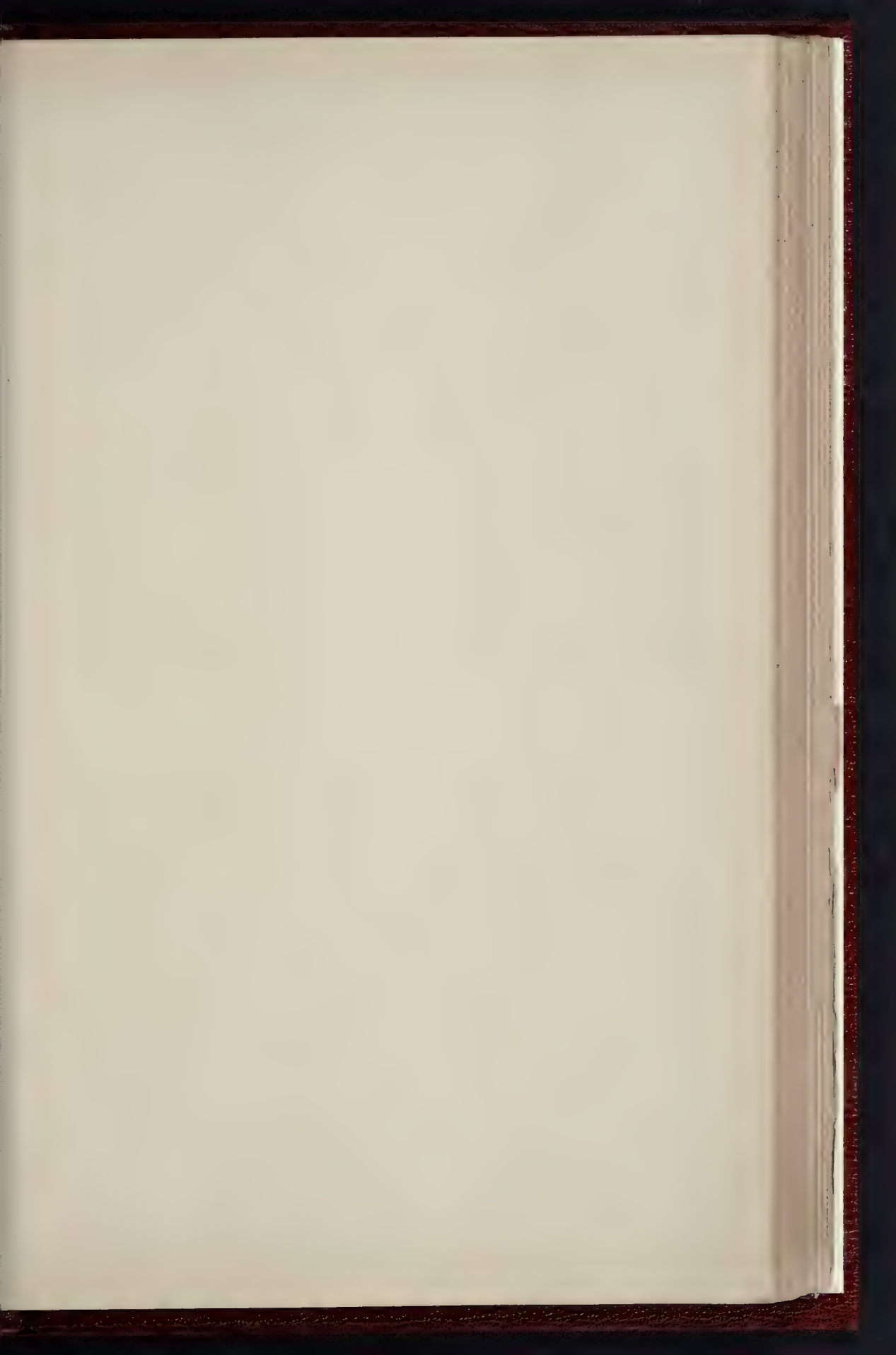
ABERDEEN ARCHITECTURE: CHURCHES.



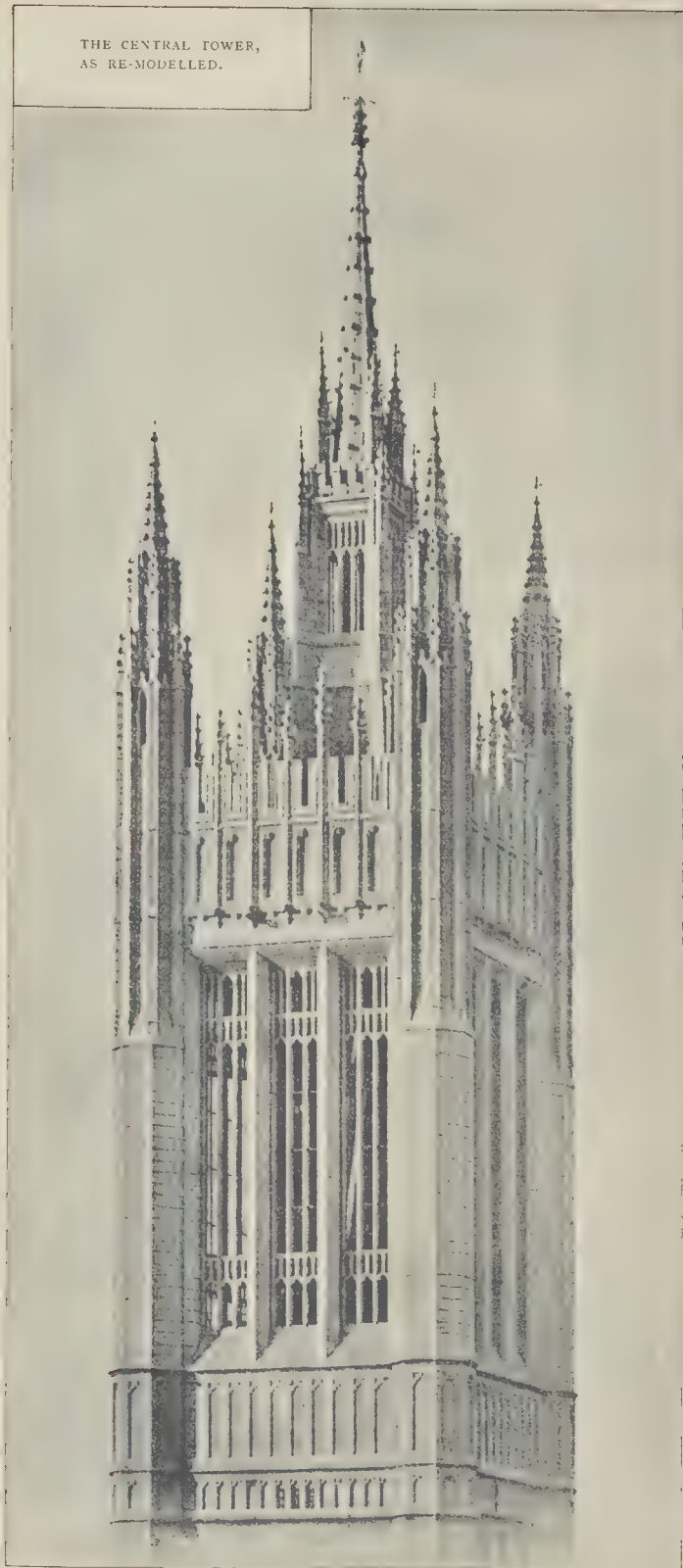




HOUSE (MESSRS. PEDDIE & KINNAR).



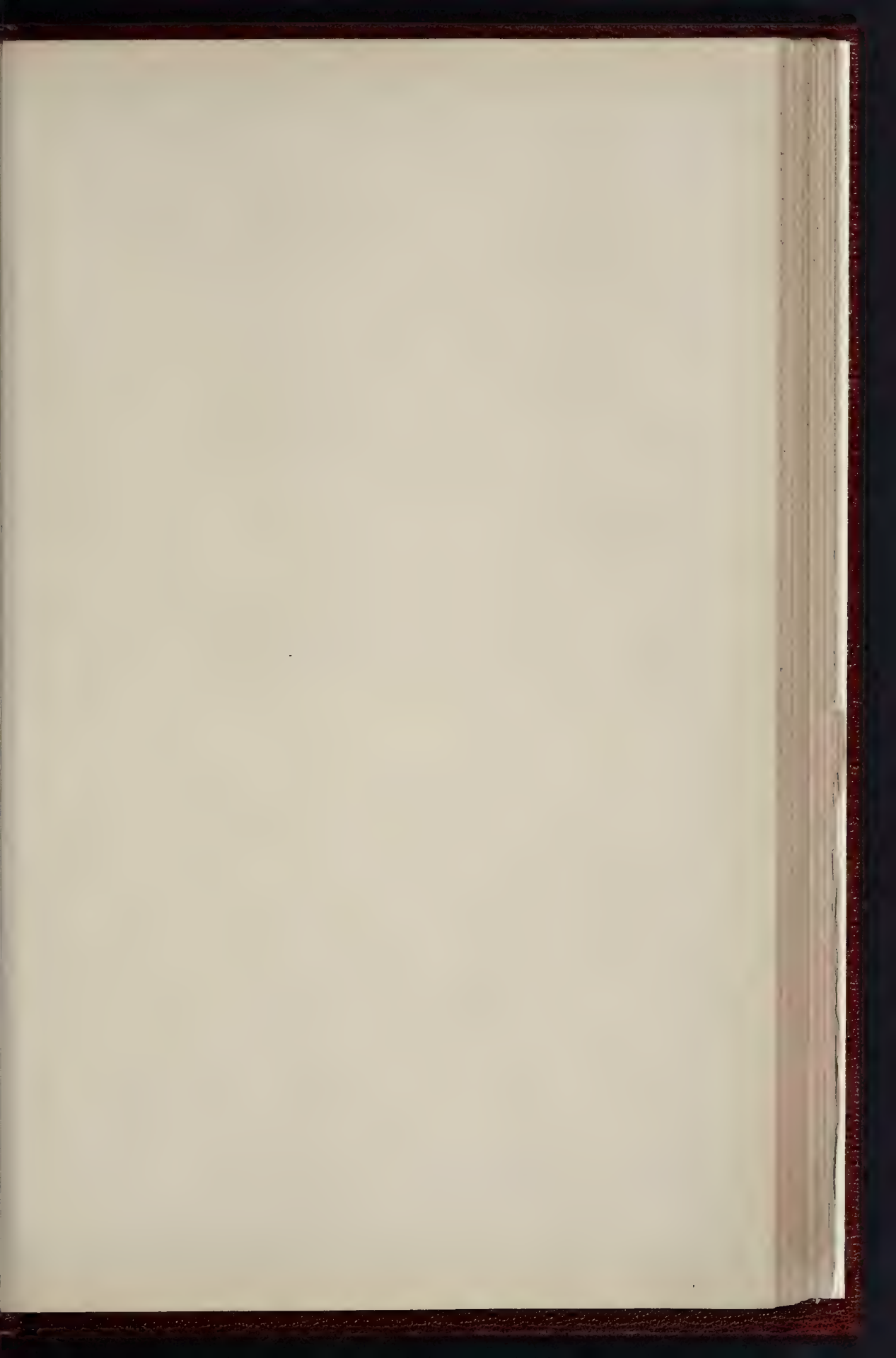
THE CENTRAL TOWER,
AS RE-MODELLED.



THE MITCHELL HALL, A
CENTRAL TOWER IN THE
BACKGROUND.



44 WEST SPRING ST. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.





COLONNADE AND MONUMENT (THE LATE JOHN SMITH).



MUSIC HALL (THE LATE A. SIMPSON).

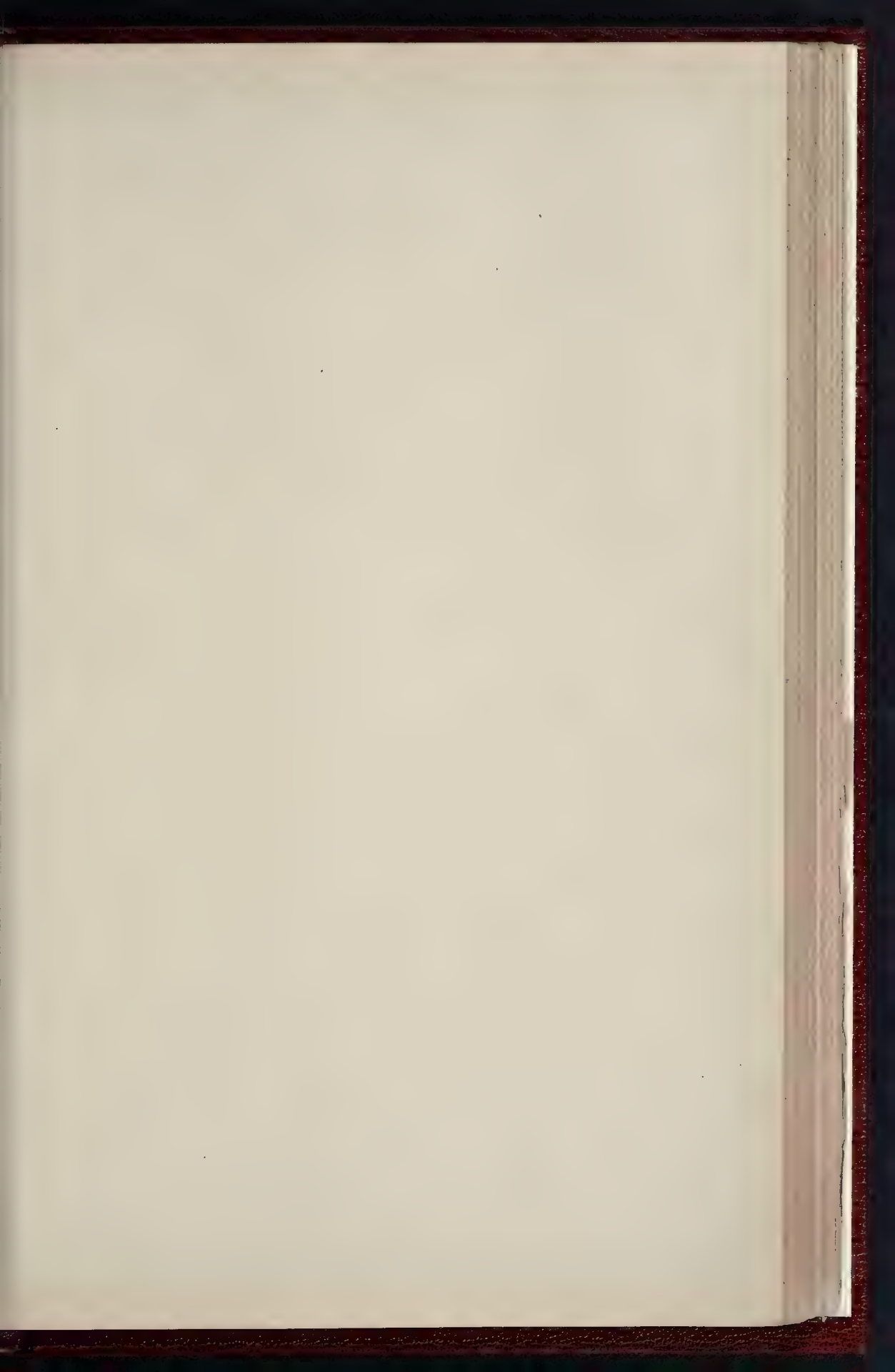


UNION BANK (BURN OF HADDINGTON). BUILDINGS IN KING STREET (THE LATE JOHN SMITH).



FREE SOUTH CHURCH (MR. A. M. MACKENZIE, A.R.S.A.).

PHOTO SPRADLE & CO. 4 & 5 EAST HADDINGTON STREET FETTER LANE E.C.





ART GALLERY (MR A. M. MACKENZIE, A.R.S.A.)



SAVINGS BANK (MR. WM. KELLY)



SAVINGS BANK (MR. WM. KELLY). SCHOOL BOARD AND PARISH COUNCIL OFFICES (MR. A. M. MACKENZIE, A.R.S.A.)



NORTHERN ASSURANCE OFFICES (MR. A. M. MACKENZIE, A.R.S.A.)

NO PHOTO SPRAGUE & CO. 4 & 5, EAST HARDING STREET FETTER LANE E.C.

n that the condemned scheme would be the e that ninety-nine architects out of every ndred would carry out, as he would get actically all his rooms lighted from a street her than from a court. Mr. Eckstein had erred to the use of reflected lights in the per floors of buildings; he, the speaker, had ver seen it done, but he should imagine it ould be a good treatment, though there might one inconvenience, viz., the cleansing of the his. Although in Chicago this method of hting was used to a large extent, he did not member having seen the canopies referred by the chairman.

Mr. F. G. F. Hooper, in seconding the vote thanks, said that the question of lighting was confined only to street architecture, and y architecture especially, but it affected all ildings. As Mr. Fletcher had said, the gencies of many sites made it extremely ficult to carry out the lecturer's ideas as to ht shafts; but if the principles were borne mind designs would, in many cases, be neficially affected. Mr. Eckstein had coned his remarks to the use of lenses, but no bt many would have noticed how a glass h an irregular surface diffused light which lear glass failed to do. He had used re- ity, with some success he believed, Ramsey's fied glass, which increased the light in a m where the window space was small.

Mr. Max Clarke asked what percentage of ht was lost after six months' traffic where br-lights were used? Were not stallboard hts much more effective? The vote of thanks having been agreed to, Mr. Eckstein, in reply, said he copied the p plans referred to by Mr. Fletcher from the 'Architectural Record,' and he thought it better leave them in the hands of architects as a ggestion as to the treatment of a principle, vement lights required to be cleaned asionally as did other glass. He would e Mr. Max Clarke to see some lenses which e been in use sixteen years. He was hested in the Chairman's remarks, and if had occasion to read a paper on the subject lighting before them again, he might deal h the system referred to by the Chair- n. Architects should visit Hill-street to see at could be done. It was interesting to the way in which the Luxfer Company dealing with the question, and there was doubt a great future before the company, t more particularly with what was called ectro-glazing—"a process which was in- sely interesting. He thought there was good son to think that cathedral glass could be ted by this system.

The Chairman said that another paper was ead that evening entitled, "Electric hting as Applied to Architecture," but, un- uly, the author, Mr. Tom Ekin, was ble to be present, but the Junior Hon. retary had undertaken to read the paper him.

Mr. S. B. Carvill then read the paper, which, ether with some notes of the brief discussion h followed, we are compelled to hold over il next week, for want of space.

Illustrations.

UR lithograph illustrations this week are all of Aberdeen buildings, and are all referred to and described in the leading cle in this week's issue, to which the reader eferred.

he illustration of the Town House is from a er-colour drawing lent by the present repre- ative of the architects; those of the Marischal lege are from a photograph and a pencil wing lent by the architect for the new k, Mr. A. Marshall Mackenzie. The illus- ons on the remaining sheets are all from tographs.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

OWN THEATRE, PECKHAM, AND POLICE STATION, CAMBERWELL.

N the 7th inst. the members met at the wn Theatre, Peckham, now in course of tion under the superintendence of Mr. est A. Runtz, the architect, who kindly nded the visit and explained the various tions and requirements involved in carry- ut what promises to be a most luxurious comfortable theatre.

te site is admirably chosen, with an exten- sion frontage to the High-street and a road on

each side of the block, which has rendered the intricate question of entrances and exits an easy problem. Originally, plans were prepared with the stage backing on to Marmont-road, but eventually the present scheme was adopted as being more suitable from a stage manager's standpoint.

Strictly speaking, from a student's point of view, the unfinished state of the building rendered it more instructive than it will be at a later period. Most of the constructional ironwork was in position, and clearly demonstrated the cantilever principle of carrying the circle and gallery without any columns to obstruct the view of the stage from the audience. The auditorium, which backs on to the High-street, is 62 ft. in width by 52 ft. in depth, and 48 ft. in height to the ceiling.

The stage, which is schemed to allow for all the modern mechanical appliances, promises to be one of the finest in London. The dimensions are 120 ft. in extreme width and 40 ft. in depth, ample space being provided for raising the scenery the full height above the proscenium. Adjoining the stage there is a scene painting-room, sufficiently large to take three frames, and with sunk wells for the lowering of the canvases; this enables the scenic artist to work from the stage floor level at all times. There are seventeen dressing-rooms arranged for easy access to and from the stage.

The accessories to the auditorium, such as the foyer, saloons, and retiring rooms, cover a large area, and have been made a special feature of the planning, and are of such a nature that the public, when visiting the theatre, will not only have the opportunity of seeing the play, but of enjoying the surroundings. Each department will be served by a large saloon, and the foyer and saloon in connexion with the grand circle will be on a larger scale than in most of the West End theatres. From the foyer there will be access at one end to the loggia, in a position above the front entrance. Judging by particulars gathered of the proposed decorative treatment of this part of the building, we shall have cause to congratulate Mr. Runtz upon having produced a most happy innovation in modern theatre designing.

With regard to the decorative scheme of the auditorium, it may be stated that the title of "Crown" has suggested to Mr. Charles Buchel, who has been entrusted with the work, a wide scope for allegorical treatment. Inasmuch as the Imperial crown of our Queen embraces the world, and "the sun never sets on her dominions," in the design for the ceiling will be found painted panels representing the colonies of England surmounted by their arms, above which figures holding the crown with a symbolic sun above are placed. Intermediate panels, indicative of Art, Music, the Drama, and Literature also find a place, and in the frieze over the proscenium opening it is intended to have a conventional painting of England and her children. The wallpaper has been designed by Mr. A. C. Breden, and from a drawing of this, which was exhibited, his unobtrusive treatment of the crown intertwined, but still an integral feature, was generally admired. The thanks of the members were conveyed to Mr. Runtz for allowing them the opportunity of gaining much useful information. The work is being carried out by Messrs. Colls & Sons.

At the conclusion of their visit to the theatre, the members proceeded to the sub-divisional police station, a new building in the same thoroughfare at Camberwell. Mr. J. Dixon Butler, the architect, has produced an interesting block of buildings embodying the necessary requirements for this special class of work. Though there is but a small frontage to Church-street, the site is of considerable extent, and there has been ample space for the separate disposition of the administrative department from the single men's quarters, which are placed on the rear portion of the site with a separate entrance. The inspectors' room and Criminal Investigation Department occupy the front portion of the ground floor, with the charge-room adjoining. Leading directly from the charge-room are two corridors communicating with the cells for the male and female prisoners. The internal walls of the cells have rounded angles, the whole of the brickwork being painted. Heating gratings with fresh-air inlets are placed in the walls near the floor at the end of each cell, and outlet ventilators in the opposite walls; these outlets are conveyed to one shaft by means of a trunk. The space under the long, low cell building is utilised as a covered

parade ground. The section house provides accommodation for twenty-four single men. In the basement are brushing, clothes, boot, and drying rooms. On the ground floor are kitchen, scullery, library, mess, and day rooms, with a stone staircase in a central position leading up to two stories of dormitories. The contractors are Messrs. W. H. Lascelles & Co.

ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—The annual meeting of this Society has just been held at Exeter, under the presidency of Mr. James Hine, of Plymouth. The annual report was presented by the Hon. Secretary (Mr. Harbottle Reed). Among other matters it referred to the resolution which had been forwarded to the Exeter City Council with regard to the preservation of the Guildhall; also to the formation of students' classes. The balance-sheet was submitted by Mr. O. Ralling, the Hon. Treasurer, after which the retiring President addressed the meeting. In the course of his remarks he said there was no work so open to criticism as the work of architects. Public and private, free and open, candid and spiteful, it lasts for all time, or as long as a building stands. He had no doubt when the Jacobean masons were piling on the agony of freestone and ornament over each sturdy, and now long-suffering, column of Exeter Guildhall façade, there were loud murmurs and solemn head shakings from venerable critics who had sworn fealty to the Perpendicular mode of construction. Well, that delightful old building, although it had long passed its second centenary, was still open to criticism. As an example, there were many things about it one would be desirous of avoiding, and nervous in imitating; yet so quaint and interesting was it in outline, and so refined in its details, that every sympathetic observer loved it. Its loss to the street would be simply irreparable, and Exeter would not be the same Exeter without it. Why was it that in more modern towns, fashionable and unfashionable, which had sprung up during the present century the impress of architecture was so imperfect and unsatisfactory? Because, for the most part, they had not been the creations or work of architects. Trade-catalogue architecture might be all very well from a strictly commercial and economical point of view, but the tendency of it was to destroy all individuality in a building and to drag architecture proper to oblivion. Buildings were being pulled down in all parts of England possessing historical interest and features of great architectural beauty. Were they to be supplanted by lifeless structures of this automatic type? Let us hope that in the coming century, as in all great periods of architecture, buildings might be more and more the reflex of the individual mind of the architect.—A vote of thanks to the retiring President was moved by Mr. Crocker. This was seconded by Mr. Arnold Thorne, Barnstaple. Mr. B. P. Shires, and Mr. J. Jerman, supported the vote of thanks which was agreed to. The following gentlemen were then elected for the ensuing year:—President, Mr. James Crocker; Vice-President, Mr. H. G. Luff, Devonport; new members of Council, Mr. James Jerman, Mr. S. Dobell, and Mr. B. P. Shires. The Hon. Treasurer (Mr. O. Ralling) and the Hon. Secretary (Mr. Harbottle Reed) were re-elected. Votes of thanks were accorded the retiring members of the Council (Messrs. C. Cole and E. G. Warren), and the Hon. Secretary and Hon. Treasurer. A luncheon was afterwards held at the New London Hotel.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting was held in the rooms, 187, Pitt-street, on Tuesday, the President (Mr. W. T. Conner) in the chair, when Mr. Oscar Paterson, Glasgow Art Workers' Guild, and Lecturer on Technology of Glass, City and Guilds of London Institute, &c., read a paper entitled "About Stained Glass." Treating of the art side of the question, he summed up the salient points thus:—"Circumstance of material governed the art of stained glass in its first stages of development. As 'art' progressed with a greater force than 'industry,' stained glass was more or less trammelled by difficulties of material; but when a certain progress and facility was attained, each craftsman followed out his art on the lines of his taste, temperament, or circumstance. Every stage of industrial progress is indicated in the development of stained glass, the most

marvellous being in the present century." The practical side in design he explained on slides illustrating old and modern work.

BRISTOL SOCIETY OF ARCHITECTS.—The last ordinary meeting of this Society for the present session was held at the Fine Arts Academy, Clifton, on Monday, the 9th inst., when a thoroughly practical paper on "Plumbing" by Mr. Geo. Tuckey was, in his unavoidable absence, read by the President. The conditions of competition and instructions to students for prize drawings were read, and it was decided to print the same for circulation, together with a letter received from the Principal of the Merchant Venturers' Technical College, stating that it was proposed to hold a special course of lectures for students desirous of presenting themselves for the Intermediate examination of the R.I.B.A. It was decided to call a special meeting of the Council to consider the question of revising the Society's by-laws, so as to provide for the annual election of two Associates on the Council.

EDINBURGH ARCHITECTURAL SOCIETY.—At a meeting of this Society, held on the 4th inst., in Dowell's Rooms, Mr. William N. Cumming in the chair, a lecture was delivered by Mr. A. N. Paterson, entitled "Evolution of the House: the Modern Product." Mr. Paterson arranged his lecture under three heads:—(1) The Modern House; (2) The Country House; (3) The Town House. Particular attention was given to aspect versus prospect in the planning of the mansion, the smaller country house or villa, and the cottage. In dealing with the town house, the limitations of light, air, and area were gone into, and in overcoming these the American style of planning was referred to.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The annual meeting of the Edinburgh Architectural Association was held on the 4th inst. in the Royal Institution, Princes-street, Mr. Thomas Ross, the President, in the chair. The report of the treasurer showed that the total membership of the Association stood at 286, that the total income for the year amounted to 135l. 10s., and the payments to 132l. 4s. 11d. The Secretary stated that in connexion with the memorial which they had presented to General Sir R. Murdoch Smith, suggesting that the Museum of Science and Art might remain open between four and six o'clock on Saturday afternoons, he had received a communication from Sir Murdoch Smith to the effect that he had submitted the memorial to the Lords Committee of Council on Education, with a recommendation that the request therein set forth be acceded to. Mr. Ross was re-elected President; Messrs. John Watson and James Bruce, W.S., were re-elected vice-presidents; and Messrs. T. Fairbairn, A. Hunter Crawford, and J. Johnston, were re-elected secretary, excursion secretary, and treasurer respectively. The President afterwards delivered his valedictory address, the subject of which was "Lesser Known Churches of Scotland." Mr. Ross, whose address was illustrated by limelight views, began with the earlier Norman churches, such as Leuchars, Dalmeny, and Tynninghame; next he directed attention to the elaborate church towers at Dunning, Muthill, and elsewhere in the district of the Tay; and dealing lastly with later churches, Mr. Ross gave an account of the collegiate churches, of which he said there were somewhere between thirty and forty in Scotland, and which were all in the late Scottish Gothic style, and were perhaps the most national works they had, without any affinity whatever to English work.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the meeting of this Institute on the 6th inst. (Judge Baylis, Q.C., in the Chair), Mr. Andrew Oliver exhibited and described rubbings of brasses from Whaddon, Dauntsey, and Broughton Gifford, Wilts, and Childrey, Berks. Professor Boyd Dawkins read a paper on the excavations made in Hod Camp, near Blandford, in 1897. This fortress of Hod Hill forms one of a series of strongholds on the River Stour to guard the country to the east from attack from the direction of the low-lying valley of Blackmore. Hod Hill stands on the edge of a precipitous chalk cliff on the eastern bank of the Stour at a height of over 100 ft. above the sea. It consists of a series of three ramparts and two fosses on every side excepting the west facing the river, which itself forms the second fosse. It is roughly rectangular in form, with rounded

angles. There is an inner camp within, and to the north-east angle of the Hod camp, known locally as Lydsbury Rings, which is fortified entirely on a different principle to that of the outer. Professor Boyd Dawkins assigned this inner camp to the work of the Roman engineer, whereas the outer stronghold belonged to the time immediately before the Roman conquest, or in other words to a late period in the prehistoric Iron Age. The interior of both fortresses contained unmistakable traces of occupation in circular pits, and, in the outer fortress, in circular enclosures. The pits in the outer fortress, sunk from three to six feet in the chalk, were the bases of old habitations more or less filled with refuse, and had flat bottoms. The refuse belonged to two different periods, that at the base to the prehistoric Iron Age, and contained rough and coarse pottery, bones of domestic animals. In some were fragments of human bones, and in one a perfect skeleton was discovered, proving that the body had been interred resting on its side in a crouching posture—a mode of burial prevalent in Britain from the Neolithic Age. In the upper stratum was unmistakable proof of Roman pottery, to be seen in the fragments of Roman pottery, including Samian ware, iron fibulae, and oyster shells. The exploration of the pits within the Roman fortress revealed the date of this occupation. Roman remains of various kinds were met with. Among the coins were one of Augustus, struck in the reign of Tiberius, and one of Caligula. With the exception of one coin of Trajan, the whole series belonged to an early period in the Roman conquest or immediately before it. It might therefore be inferred that the military occupation was not continued far into the second century after Christ.

COMPETITIONS.

TOWN HALL, TAUNTON.—Thirteen architects have sent in plans in connexion with the competition for providing designs for a new town hall at Taunton. They are to be adjudicated upon by Mr. E. W. Mountford, and will be exhibited in the Parade Assembly Rooms.

HOSPITAL, LISCARD.—Messrs. Maxwell & Tuke, architects and surveyors, of Manchester, submitted competitive plans for the new central hospital to be erected at Liscard, and the Wallasey District Council have accepted the designs.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. McKinnon Wood, Chairman, presiding.

The Works Department.—The Finance Committee reported as follows:—

"We have considered as to what percentage should be added to the cost of estimated works executed by the Works Department and completed subsequent to March 31, 1898, to cover general and establishment charges. The manager is of opinion that works to the value of 200,000l. will be executed during the current year, and to clear the general charges account it will be necessary to add 8 per cent. to the expenditure on wages and materials charged to each work, and we have accordingly adopted this percentage. We shall consider in October whether it will be necessary to alter this percentage, in consequence of the value of work executed by the department exceeding or being less than the manager's present estimate."

Rates of Wages, &c.—The report of the General Purposes Committee contained the following paragraph:—

"The Council on March 22 last referred to us for consideration and report a petition from the London Building Trades Council, asking the Council to alter the rates respecting the rate of wages and hours of labour from twelve to twelve and a half. The application is made on the following grounds:—1. Inasmuch as all work undertaken by the Council is for the purposes of providing for the necessities of London, and the cost of such work has to be met out of the rates levied by the Council on London, all work so executed should be done under the working rules of the trades concerned and connected with the London district. 2. Outside the twelve-mile radius, and within the twenty-mile radius, there is no recognised association of employers, except in one or two localities, and therefore no general agreement as to the rates of wages and hours of labour can be made. The Council will recollect that in the report of the Committee to the Council in November last, with reference to the revision of the standing orders relating to the conditions of contract, the question of the radius was dealt with, and it was then decided

that the radius should be altered from twenty to twelve miles. Previously to this (in February, 1896) the Committee, in reporting to the Council on this subject, pointed out that the radius of twenty miles had been fixed by the Council on the ground that such a limit would include all places at which the Council might carry out works, as, for instance, sites for asylums, and on the recommendation of the Committee the Council resolved that no alteration should then be made in the radius. Having further considered the matter, we are of opinion that the Council should revert to the twenty-mile radius, and we accordingly recommend—(a) That the radius be altered from twelve to twenty miles. (b) That the standing orders be revised accordingly."

Sir Arthur Arnold protested against the recommendations, because, in his view, it was a matter of grave import to the business and the reputation of the Council as a Municipal government. With great advantage to the working classes, and without dissent on the part of the employers, the Council had established a system by which the rates of wages and the hours of labour accepted by the Trade Unions and the Employers' Union, "and in practice obtained," were included in the schedule attached to their contract form, and were substantially part of that contract. The essential part of that agreement was that these rates and hours should apply within twelve miles of Charing Cross. He admitted that the only reason for adhering to these rates was because it had been agreed upon by the two bodies mentioned. A great deal had happened since the arrangement was come to, but it was neither dignified nor just to alter that arrangement with every change in the constitution of the Council. He protested against making use of that Council to forward an unwise and impolitic policy, and declared that they would not be holding the scales between labour and capital justly if they adopted the recommendations.

Mr. Beachcroft supported the views of Sir Arthur Arnold, and moved that the recommendations should be referred back. The Council must stand by the compromise which had been arrived at, or the public would have but little faith in their resolutions.

Mr. H. Clarke seconded the amendment. Mr. H. R. Taylor said that in all the skilled trades London rates were already paid at the Asylum at Bexley, and that of the City Corporation at Stone. Only the labourers suffered by the contraction of the radius; the skilled trades could look after themselves.

Mr. G. Dew said that in country places where large works were being carried out, and large bodies of workmen were imported, the cost of living and travelling was heavier than in London. Good men could not be got to country jobs unless the London rates were in operation, and in the interest of good work it was desirable that the radius should be extended.

Mr. Howell J. Williams said the attempt to alter the radius was being made in the interest of one particular class. He was a thorough supporter of the Works Department, and hoped that sufficient work would be given to the Department to make it a success. If the proposed alteration were agreed to, it would undoubtedly increase the cost of asylum outside the twelve-mile radius by 10 per cent. Not one word of objection to the twenty-mile radius had been made to the Council of the Master Builders' Association. Why should the present regulation be interfered with? There was a general idea that a London master who was carrying out work outside the twelve-mile radius sent all the men necessary from London. That was a mistake; a few picked men were sent, but the majority were taken on locally. The London rates were higher than those in the country, in consequence of the cost of living, &c., being higher. Would it be fair that local men should be paid, and these circumstances, the same rate as the London men? The alteration would be an unfortunate one, and it was not fair to propose to make it without getting the views of the master builders on the subject.

Earl Carrington recommended the Progressive party to vote for the extension of the radius.

Mr. McDougall said he had found, as Chairman of the Asylums Committee, that they could not get the work done satisfactorily under the present arrangement, and he had therefore given notice to move a resolution in favour of reverting to the twenty miles rule. Disputes arose between the contractors and their men, which led to considerable delay and inconvenience.

Mr. John Burns said that long before the formation of the London Building Trades Council presented, Mr. McDougall had moved, in the interests of the Council, that it was inadvisable to retain the twelve-mile radius. The present arrangement led to disputes, and it saved the Council's work. For six and a half miles the twenty-mile rule prevailed, and during that time there was practically no inconvenience.

Mr. E. White said that if the twenty-mile limit were reverted to, the members of the Master Builders' Association would not tender for the Council's work, which would go to provincial contractors.

Mr. Goodman having spoken in support of recommendations,

Sir Arthur Arnold said that, in common fairness, the recommendations should be referred back until the opinion of the Master Builders' Association had been taken upon it.

The Council then divided, and the amendment was defeated by 71 votes to 48.

Slade Ravine, Plumstead Common.—The Parks and Open Spaces Committee recommended that the Council, without giving any formal consent thereto, do offer no opposition to the Vestry of Plumstead completing the embankment across the Slade in the manner indicated in their letter of November 24, 1897, and in the plans and specification which accompanied the letter; and that the Vestry of Plumstead be informed of the decision of the Council.

An amendment, to refer the matter back, with an instruction to the Main Drainage Committee to look into the matter, was agreed to.

Proposed Sale of a Freehold.—The Corporate Property Committee recommended that the Council should sell to the City Parochial Foundation two small freeholds in Queen Victoria-street for £520l.

After a long discussion, in which strong objection was taken to parting with any of the Council's property in ground rents, the recommendation was rejected by 55 votes to 52.

The Collapse of a Building in Westminster.—Mr. Crooks asked the Chairman of the Building Committee, in reference to the collapse of a building in Westminster, whether the Council's architect would be instructed to give evidence before the Coroner in the interest of the people of London. Mr. Taylor asked whether the Committee was aware that workmen had been employed at night in patching up structures in adjoining buildings. Was not this a highly improper proceeding? Mr. W. Davies (the Chairman) said when the Coroner had concluded his inquiry it would be the duty of the Building Act Committee to deal with the whole matter. He had no knowledge of anything having been done to adjoining houses, but the superintending Architect had been instructed to closely watch the interests of the Council. He solicitor and the architect would attend the Coroner's inquiry, and if the Coroner brought the evidence of the latter would assist in the Committee would be glad for him to render his services.

The Council adjourned at 7.15.

THE SANITARY INSPECTORS' ASSOCIATION.

At the monthly meeting of this Association, held on Saturday last at Carpenters' Hall, a paper on "Dangers to Health from Defective Sanitary Appliances" was read by Mr. W. Wilkinson (Alotites). Mr. G. T. Dee, Chairman of the Council, presiding. In the earlier proceedings a discussion arose on the nomination of an Assistant Sanitary Inspector, a large number of the members present being of opinion that Assistant Inspectors were only entitled to be elected as Associates. After discussion, Mr. Ellenden, Assistant Sanitary Inspector for Kensington, was elected as a member by a majority of one.

The main object of the paper was to show that were the most common defects in sanitary construction to be expected, and how they were to be discovered and remedied. In old property, box drains running through the basement might often be found; some formed of rubble-stone, others of brick with flag coverings, and others, again, with field buttend pipes, laid, perhaps, on uneven bottoms, at different angles, with gaping joints, and with pipes and sockets cracked or broken in places, the inevitable result being that the drains in which they were laid, and which

were usually in close proximity to the walls (where they were not in the dwelling itself), generally became sewage-logged. A favourite position for the cesspool formerly was the cellar, or some position as close to the house as possible. Even now, when these old abominations were universally scouted, the equivalent of a cesspool would often be found in the yard or court in the form of a gully of large capacity, which was seldom effectively flushed and rarely emptied by other means. Such gullies were death-traps—the sources in which the most dangerous gases could generate, poisoning the passer-by or the inmates of the adjacent dwelling, through the open windows or doors of which the gases were sucked, by the difference of temperature. The safest form of yard gullies had, like the Cecil, little or no room for deposit, with an outlet at the end of the trap larger than that at the bottom, so as to ensure that whatever passed through would flush it entirely. If a trap with an 8-in. inlet were used where one of 6 in. would do, the velocity of the current required to drive the solids through would be diminished. This was a point on which the feared architects still often erred, in specifying drains of too large a size. Instances of all these defects could be cited constantly from his own every day practice, and from the practice of every sanitary inspector of much experience. Closets, traps, and bends could not be too strictly examined to discover any projections that might exist in the interior, through the sweating through the joints of solder or cement. Hair-combings and other matters in bedroom refuse would catch on such projections, and there was then a danger of the gradual emptying of the trap by capillary attraction where the closet was long out of use. With regard to the question of the ventilation of drains, the lecturer said he was entirely against the surface ventilation grates, as well as the dangerous practice of connecting from the sewer into manufacturing chimneys. Sanitary engineers had expressed a clear and decided opinion against the present system of taking up ventilating shafts on the outer walls of houses unless they were run up to a great height above the roofs. When the air was still, the sewer gases might be drawn down some distance and might pass through the open windows of bedrooms, or down such flues of the chimney-stacks as might not happen to be passing heated air, and so disseminate deadly poisons through the house even more effectually than would be done through defective drains. There was only one way of dealing with this danger. The foul gases must be absolutely destroyed, and this could only be economically done by burning them. If connexions were made along the lines of sewers with gas-destructor lamps, placed at street level and at the highest points of the lines, the sewage gas would be drawn out and destroyed, and they would not be far from realising a great desideratum—the purification of sewage in its passage through the conduits. Sewage, however foul when it entered the conduits, would at the outfall be practically innocuous. This method of ventilation would be constant and automatic in its action, and would effect economies in many ways—dispensing with the waste of water in flushing and avoiding the costly use of chemicals. The extraction of the foul gases would cost nothing when gaslight was required, and would only cost 1d. for every 4,000 or 5,000 cubic feet extracted when light was not required. That there was no danger from explosion or other similar cause was proved by the acceptance of the system by the Gas Light and Coke Company of London, after long and severe tests before allowing it to be employed in connexion with their mains.

The usual vote of thanks was accorded to the lecturer by acclamation.

WALTHAM ABBEY.—We have received several interesting letters on the subject of Waltham Abbey, which we shall publish next week.

RECREATION GROUND, HARROGATE.—At the Harrogate Council Chamber on the 3rd inst., Mr. G. W. Willcocks, M.Inst.C.E., held an inquiry relative to the application of the Harrogate Town Council for sanction to borrow 30,500l. for the purchase and laying-out of Harlow Moor as a recreation ground. Harlow Moor is situated about a quarter of a mile from the Royal Pump-room, and has been leased to the Corporation by the Earl of Harewood for a number of years. The amount proposed to be purchased is 521a. 2r. 20p., a little more than at present leased. Mr. S. Stead (Borough Surveyor) gave evidence as to the formation of the roads, sewers, &c.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At a recent meeting of the London County Council, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Clapham.—A mission-room, with a projecting porch, on the north side of Grange-road on a site at the rear of Nos. 24 and 26, Lambourn-road. (Mr. J. F. Evitt for the London City Mission).—Consent.

Chelsea.—A one-story shop upon part of the forecourt of No. 183b, King's-road (Mr. J. E. Arpin for Mr. F. C. Woolmer).—Consent.

Dulwich.—Five houses with projecting bay windows on the north side of Crawthorpe-grove, Camberwell (Mr. A. E. Mullins for Mr. L. Nodley).—Consent.

Hampstead.—A projecting bay window to a house on the north side of Lindfield-gardens, and the retention of a wooden balustrade on the flat roof of the one-story addition to such house (Mr. W. J. Wood for Mr. E. B. Lemon).—Consent.

Kensington, South.—Bay windows and balconies to proposed residential flats on the east side of Queen's-gate (Mr. P. Hofmann for Mr. H. Bailey).—Consent.

St. Pancras, East.—A porch at No. 228, Camden-road (Mr. J. M. Kennard for Mr. A. Rogerson).—Consent.

Westminster (detached).—An inclosed porch at the entrance to Messrs. Harvey, Nichols & Co.'s premises on the west side of Seville-street, at the corner of Harriet-mews, Knightsbridge (Mr. C. W. Stephens).—Consent.

Kensington, South.—A glass and iron covered way in front of No. 16, Campden-house-road (Messrs. W. T. Allen & Co. for Mr. M. Levy).—Consent.

Hampstead.—Buildings on the north-east side of High-road, Kilburn, to abut upon Kilburn-priory-road (Mr. A. O. Collard for Captain J. F. Bagot, M.P., and Mr. A. Chudleigh).—Consent.

Horton.—A building on the site of five houses, with forecourts, on the east side of Clifton-street, Shoreditch, between Worship-street and No. 9, Holywell-row (Mr. J. E. Saunders for Messrs. Wertheimer, Lea, & Co.).—Consent.

Battersea.—One-story shops on part of the forecourts of Nos. 35 and 36, Broadlands-terrace, Broomwood-road (Mr. J. Stanbury).—Consent.

Greenwich.—A one-story shop on the east side of Woodlands-road, abutting upon Old Dover-road (Mr. A. Huxley).—Consent.

Hammersmith.—One-story shops upon part of the forecourts of Nos. 65, 67, 69, 71, 73 and 75, Goldhawk-road (Mr. W. J. Wood for Messrs. Soley, Willmott & Fletcher).—Consent.

Hampstead.—A one-story library building on the eastern side of Westbere-road, at the corner of Sarsen-road (the Vestry of Hampstead).—Consent.

Hampstead.—An iron and glass pent over the entrance to No. 40, Canfield-gardens, to abut upon Fairhazel-gardens (Mr. J. W. Stevens for Mr. E. Grover).—Consent.

Kensington, South.—An open portico at the entrance to No. 18, Cromwell-place (Messrs. Langdale, Hallett, & Co. for Union Bank of London, Limited).—Consent.

Levensham.—Houses, with shops, upon the site of Nos. 141 and 143, Rushey-green, Catford (Mr. A. L. Guy for Mrs. Atkins).—Consent.

Levensham.—A house, with a shop, on the north side of Ladywell-road, at the corner of Algernon-road (Mr. A. Roberts).—Consent.

Levensham.—A one-story school building and a cookery and laundry centre on the east side of Brockley-rise, at the corner of Brockley-park (Mr. T. J. Bailey for School Board for London).—Consent.

Paddington, South.—An open portico at the entrance to No. 35, Cambridge-street (Mr. A. R. Stenning for Lloyd's Banking Company).—Consent.

St. George, Hanover-square.—The inclosure of the sides and front of the portico at No. 47, Brook-street (Messrs. G. Trollope & Sons for Lady Delamere).—Consent.

St. George, Hanover-square.—A balcony at the first floor level in front of Love's Hotel, Nos. 35 and 36, Albemarle-street, Piccadilly (Mr. C. Sewell for Mr. R. Ball).—Consent.

Deptford.—One-story shops upon part of the forecourts of Nos. 190, 192, 194, 196, and 198, Trundley's-road and No. 1, Sanford-street (Mr. A. E. Symes for Mr. J. Beck).—Refused.

Strand.—Three bay windows and an angle turret to a proposed addition to the Princes Restaurant on the site of Nos. 36, 37, and 38, Jernyn-street, St. James's (Messrs. J. T. Wimpey & Arber for the Princes-hall Restaurant, Limited).—Refused.

Marylebone, East.—A wood and iron projecting sign in front of No. 16, Great Marylebone-street (Mr. W. D. Caroe for Mr. T. Foakes).—Refused.

Bow and Bromley.—A house, with a shop, on the east side of Wansbeck-road, Hackney-wick, adjoining No. 54, and abutting upon Allamouth-road. (Mr. F. W. Rogers).—Refused.

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

Dulwich.—Buildings with bay windows on the west side of Grove-lane and south side of Champion-park, on the site of No. 1, Champion-park and grounds. (Mr. A. Blackford for Mr. T. Freeman).—Refused.

Fulham.—One-story shops upon the forecourts of Nos. 663, 665, and 667, Fulham-road. (Mr. D. Matthews for Mr. F. W. Potter).—Refused.

Hackney, Central.—That Mr. A. Bedborough be informed that his application on behalf of Mr. W. Andrews for the consent to the erection of two blocks of residential flats with shops, on the west side of Lower Clapton-road, between Holly-lodge and Maitland-house, having been further considered, the Council has resolved to adhere to the decision of February 28, 1898, upon the application.—Agreed.

Kensington, South.—A block of buildings with projecting bay windows, &c., at Hyde-park-gate, on the south side of Kensington-road, to abut also upon Palace-gate. (Mr. B. Hoesgood).—Refused.

Levensham.—That Mr. J. Stanford be informed that the Council is not prepared to further modify, by the omission of the words "for the use of the public," its consent of February 22, 1898, as modified by the resolution of March 29, 1898, to the erection of five houses with one-story shops on the west side of Hither-green-lane, next a house known as The Laurels.—Agreed.

Levensham.—Three houses with one-story shops, on the south side of Honor Oak Park, between Standon Park and Brockley-rise, and a house with a one-story shop on the east side of Standon Park to abut on Brockley-rise (Mr. A. Roberts for Mr. R. Soper).—Refused.

St. George, Hammer-squar.—That Mr. T. J. Gawthorpe be informed that his application on behalf of Messrs. Thomas & Son for consent to the erection of a glass and iron pent at the entrance to No. 32, Brook-street, to abut upon South Molton-street, having been further considered, the Council sees no reason to depart from its decision of March 29, 1898, not to grant the application.—Agreed.

Strand.—Iron and glass oriel windows and balconies on the first floor level of two warehouses to be erected on the site of Nos. 3, 4, and 5, Denmark-street, St. James's (Messrs. D. Cobitt, Nicholls, Sons, & Chuter for Mr. W. F. Lobb-Williams).—Refused.

Battersea.—A one-story building erected in the garden at the rear of No. 75, Falcon-road, and abutting upon Falcon-grove (Mr. J. Chapman).—Refused.

Greenwich.—A block of six houses, two of which are shown to flank upon Mauritius-road and Azof-street respectively (Mr. W. C. Jones for Mr. J. Vavasseur).—Refused.

Levensham.—Six houses with bay windows on the north side of Bly-the-hill, Catford (Mr. J. W. Webb).—Refused.

Marylebone, West.—A one-story shop front to No. 1, Duke-street, Manchester-square (Messrs. Howgate, Leeds, & Keith for Mr. G. Coulthurst).—Refused.

Width of Way.

Hackney, North.—A building on the west side of Birkbeck-road, Dalston (Mr. L. Solomon for Messrs. Blundell & Co.).—Consent.

Rotherhithe.—Variation from the plan sanctioned on March 9, 1897, for the erection of an addition to the flank of the "King's Arms" public-house, No. 251, Tooley-street, to abut upon Three Colt-lane, St. Olave, Southwark (Messrs. Eedle & Meyers for Mr. J. T. Holt).—Consent.

Limchouse.—A one-story building to abut upon Wapping Dock-street and Cinnamon-street respectively (Messrs. E. N. Clifton, Son, & Hope for Mr. H. Lafone).—Consent.

City of London.—The Sir John Cass Technical Institute, on the east side of Jewry-street, to abut also upon George-street and Little George-street. (Mr. A. W. Cooksey for the Governors of the Sir John Cass Foundation).—Consent.

Limchouse.—A two-story cottage on the east side of School-house-lane, Broad-street, Ratcliff. (Mr. H. O. Ellis for Messrs. C. Poulter, Limited).—Consent.

St. Pancras, East.—A one-story workshop at the rear of Nos. 12 and 13, Rochester-terrace, Camden Town, abutting upon Rochester-place. (Mr. J. M. Kennard for Mr. P. Wilson).—Consent.

Limchouse.—Two warehouses on the site of No. 75, Wapping-wall. (Mr. E. A. B. Crockett for Messrs. Anderson, Weber, & Smith).—Refused.

Southwark, West.—A stable on the north side of Orange-street (Mr. E. Carritt for Mr. J. Sainsbury).—Refused.

Kensington, South.—A building on part of the gardens at the rear of Nos. 32, 34, 36, and 38, Abingdon-road, to abut upon Sutton-street and Park-terrace (Messrs. Goodwyn & Sons for Mr. T. Parker).—Refused.

Open Spaces about Buildings.

Chelsea.—That the Council do, in the exercise of its powers under sec. 41 of the London Building Act, 1894, allow a modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of a block of six-story residential flats, with shops on the ground floor, on the west side of Basil-street, Brompton-road, at the corner of New-street, with an open space in the rear not in conformity with the provisions of the Act, and that the sanction of the Council be given to a modification of the provi-

sions of Part V. of the Act with regard to the extension above the diagonal line as directed to be drawn, so far as relates to the said building (Mr. C. W. Stephens for Harrod's Stores, Limited).—Agreed.

Fulham.—That the Council do, under Section 41 of the London Building Act, 1894, allow the erection of Nos. 4, 5, 6, 7, 8, 9, 10, 11, and 12, The Crescent, North End-road, at the corner of Lillie-road, with an open space at the rear of each building (Mr. W. A. Large for Messrs. Jones Brothers).—Agreed.

Deviation from Certified Plans.

Finsbury, Central.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "London Spa" public-house and the Northampton estate audit rooms, No. 70, Exmouth-street, Clerkenwell, at the corner of Rosoman-street (Mr. W. A. Aickman and Mr. J. K. Bateman for Mr. H. H. Finch).—Consent.

Lambeth, North.—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "Spanish Patriots" public-house, No. 34, Lower-marsh, Lambeth (Mr. J. W. Brooker for Mr. Gilbert).—Consent.

Finsbury, Central.—A building on a portion of the open space at the rear of the "London Spa" public-house and Northampton Estate Audit Rooms, No. 70, Exmouth-street, Clerkenwell, at the corner of Rosoman-street (Messrs. W. A. Aickman and J. K. Bateman for Mr. H. H. Finch).—Consent.

Line of Fronts and Width of Way.

Deptford.—One-story shops upon part of the forecourts of Nos. 253A, 255A, 257, 259, and 261, New Cross-road (Mr. G. A. Wilson for Mr. R. Farnan).—Consent.

Finsbury, Central.—A one-story shop addition to, and the setting back of the upper part of, the present two-story building at No. 2A, Hermes-street, Pentonville (Mr. T. H. Watson for Captain F. T. Penton).—Consent.

Peckham.—That the consent of the Council of April 5, 1898, to the erection of a building on the north side of Elm-grove, Rye-lane, Peckham (Mr. P. Moss for Mr. S. Sayer), be modified by the substitution of the words "22 ft." for the words "16 ft."—Agreed.

Rotherhithe.—That the application of Messrs. Barnes-Williams, Ford, & Griffin for Messrs. France & Co., Limited, for an extension of the period within which the erection of a portion of a warehouse on the south side of Pickle-herring-street, Horsleydown, the erection of two open iron bridges across Pickle-herring-street, the erection of a building to a giveland-take line on the west side of Vine-street and the widening of a portion of Stoney-street, were required to be completed, be granted.—Agreed.

Fulham.—Additions to Nos. 162 and 184, New King's-road, to abut on that road also on Fulham Park-gardens (Mr. A. E. Chasemore for Mr. T. H. Sheen).—Refused.

Kensington, South.—A one-story shop on part of the fore-court of Jasper House, Earl's Court-road (Messrs. J. W. Morley & Letts for Mr. J. Buckle).—Refused.

Peckham.—One-story shops in front of Nos. 571 and 573, Old Kent-road, Croydon (Mr. E. J. Stevens for Mr. T. Wade).—Refused.

Strand.—Rebuilding of the "Globe" public-house, No. 58, New Compton-street, with an oriel window at the first, second, and third floor levels, and the ground story advanced (Mr. T. W. Moss for the Winchester Brewery Company, Limited).—Refused.

Formation of Streets.

Clapham.—That an order be sealed and issued to Mr. J. Stanbury, sanctioning the formation or laying out of two new streets for carriage traffic on the Beechwood Estate, West Side, Clapham Common, and the formation on the estate of a short length of street, 40 ft. wide, next the common. That the names Culmstock-street and Winsham-street be approved for the new streets.—Agreed.

Dulwich.—That an order be sealed and issued to Mr. J. W. Brooker sanctioning the formation or laying out of a new street, for carriage traffic, to lead out of Elsie-road into Grove-vaile, Goose-green (for Mr. W. H. Thompson).—Agreed.

Woodwich.—That an order be sealed and issued to Messrs. Church, Quick & Whincop, sanctioning the formation or laying out of a new street, for carriage traffic, to lead out of Wickham-lane, Plumstead. That the name Proctor-street be approved for the new street.—Agreed.

Norwood.—That an order be sealed and issued to Mr. L. P. Hodge, sanctioning the formation or laying out of a new street, for carriage traffic, to lead from Knight's Hill-road into High-street (for Mr. P. Stock).—Agreed.

Wandsworth.—That an order be sealed and issued to Mr. L. S. Rogers sanctioning the formation or laying out of a new street for carriage traffic, to lead from Balham Hill into Cavendish-road, Clapham. That the name Yukon-road be approved for the new street (for Mr. J. Jenkins).—Agreed.

St. Pancras, North.—That Messrs. Boehmer & Gibbs be informed that their application, on behalf of Mr. A. W. Armstrong, for the Council's sanction to the formation or laying-out for carriage traffic of a new street to lead out to the west side of Highgate-road,

the surrender of a portion of the estate for the formation of a street on the east side of Parliament Hill, and the dedication to the use of the public of certain land, no reason is seen why the Council should depart from its decision of February 8 last, not to grant the application.—Agreed.

Hammersmith.—That an order be sealed and issued to Mr. J. H. Hayes refusing to sanction the formation or laying out for carriage traffic of a new street, 40 ft. wide, to lead out of the north side of King's street West.—Agreed.

Clapham.—That an order be sealed and issued to Messrs. H. Wakeford & Sons sanctioning the formation or laying out of three new streets, for carriage traffic, to lead out of the east side of Manor-street, High-street (for Mr. C. G. St. John). That the names Elmhurst-street, Voltaire-street, and Balzac-street be approved for the new streets.—Agreed.

Clapham.—That an order be sealed and issued to Messrs. Lee & Pain, sanctioning the formation of laying out of two new streets, for carriage traffic, to lead out of the south side of Poynder's-road, Cavendish-road (for Sir J. Dickson-Poynder, Bart., M.P.). That the names Honeybrook-road and Rudloe-road be approved for the new streets.—Agreed.

Wandsworth and Clapham.—That an order be sealed and issued to Mr. A. C. Pillar sanctioning the formation or laying out of a new street, for carriage traffic, between Grove-road and Hyde-horpe-road. That the name Radbourne-road (in continuation) be approved for the new street.—Agreed.

Wandsworth.—That an order be sealed and issued to Mr. A. K. Stephens, sanctioning the formation of laying out of two new streets, for carriage traffic, between Mitcham-road and Bickerseth-road, Lavender Tooling (for Messrs. Robert Trewhin and Barrie). That the names Glasford-street and Renmuir-street be approved for the new streets.—Agreed.

Wandsworth.—That an order be sealed and issued to Mr. R. C. T. Gordon, sanctioning the formation or laying out of two new streets, for carriage traffic, to lead out of the west side of Garratt-lane, and the widening of that lane near Trewhin, on the east side of Garratt Park, Maida Hill, Earsfield. That the names Steerforth-street and Thorndean-street be approved for the new streets.—Agreed.

Wandsworth.—That an order be sealed and issued to Mr. A. Wellings, sanctioning the formation of laying out of new streets, for carriage traffic, on the east side of Garratt-lane and south side of Swaffield-road, Earsfield, and the widening of portions of Garratt-lane. That the names Wilna-road (in continuation), Atheldene-road, and Farlton-street be approved for the new streets.—Agreed.

Wandsworth.—That an order be sealed and issued to Mr. A. Wellings, refusing to sanction the formation or laying out, for carriage traffic of new streets, 40 ft. wide, on the east side of Garratt-lane and south side of Swaffield-road, Earsfield.—Agreed.

Wandsworth.—That an order be sealed and issued to Mr. P. E. Pilditch, refusing to sanction the formation or laying out, for carriage traffic, of a new street, varying in width from 16 ft. to 20 ft. to lead out of the west side of Heathview-gardens, Portsmouth-road, Putney.—Agreed.

Artisans' Dwellings.

Hampstead.—That the Council do, in the exercise of its powers under section 42 of the London Building Act, 1894, disapprove and refuse to sanction the plans, delivered by Mr. J. Emblin-Walker for Mr. W. H. Watts, of a block of dwellings not abutting upon a street and adapted to be inhabited by persons of the working class, on the west side of a yard leading out of Church-lane, adjoining the grounds of the Sailors' Daughters' Home.—Agreed.

Islington, North.—That the Council do, in the exercise of its powers under section 42 of the London Building Act, 1894, disapprove and refuse to sanction the plans, delivered by Mr. W. R. Laurence for Mr. C. Gillatt, of two blocks of dwelling-houses abutting upon a street, and adapted to be inhabited by persons of the working class, at the rear of Nos. 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, and 315, Hornsey-road, with a gateway entrance approach, 12 ft. wide, between Nos. 303 and 305.—Agreed.

Space at Rear.

Wandsworth.—That the Council do, in the exercise of its powers under Section 41 (1) (vi.) of the London Building Act, 1894, allow a modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of a two-story dwelling-house on the east side of Bangalore-street, Putney, with an irregular space at the rear. (Mr. W. H. Rackett).—Agreed.

Buildings for the Supply of Electricity.

Lambeth, North.—That the Council do approve of the plans submitted with the application of Mr. W. B. Pinhey for Charing Cross and Strand Electricity Supply Corporation, Limited, for the construction of a proposed extension of the company's generating station and works at No. 83, Commercial-road.—Agreed.

Neerington, West.—That the Council, in the exercise of its powers under Sections 13, 22, and 203 of the London Building Act, 1894, do approve of the plans submitted with the application of Messrs. Kincaid, Waller, & Manville for the Vestry of St. Mary, Newington, for the construction of a electricity generating station and works on the

north side of Penrose-street, Walworth, on the site of Nos. 20 to 34.—Agreed.

Southwark, West.—That the Council do approve the plans submitted with the application of Mr. F. Bailey for the City of London Electric Lighting Company, Limited, for the construction of additions to the Company's generating station and works on the south side of Bankside.—Agreed.

Dwelling-houses on Low-lying Lands.—Part XI.

Woolwich.—That the solicitor do prepare a licence under section 122 of the London Building Act, 1894, to Mr. T. P. White for the erection of two dwelling-houses on low-lying land situated on the north side of Bostall-lane, Plumstead.—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

BOOKS RECEIVED.

THE MUNICIPAL AND SANITARY ENGINEERS' HANDBOOK.—By H. Percy Boulnois. Third edition. (E. & F. N. Spon.)

WORKING MEN'S INSURANCE.—By W. F. Wilmshurst. (T. Y. Crowell & Co.; New York.)

STREET-CLEANING AND ITS EFFECTS.—By G. E. Waring, Jun. (Gay & Bird.)

PARTY STRUCTURES.—By Sydney Perks. (St. Bride's Press.)

COTTON FIRES AND COTTON BALES.—By R. H. Scotter. (C. & E. Layton.)

WORKSHOP MAKESHIFTS.—By Hans J. S. Cassal. (L. Upcott Gill.)

A GUIDE TO THE GUILDHALL.—(Simpkin Marshall & Co.)

INDUSTRIAL ELECTRICITY.—Edited by A. G. Elliott. (Whitaker & Co.)

THE MANUFACTURE OF GLAZED BRICKS AND GLAZED SANITARY WARE. By H. Ansell. Second Edition. (H. Greville Montgomery.)

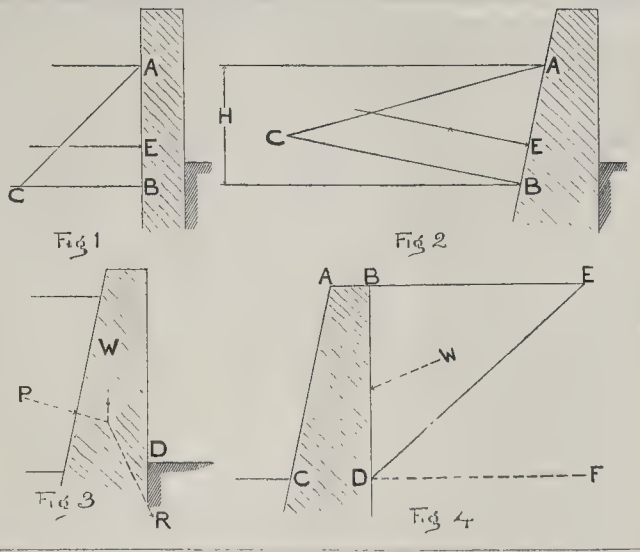
The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XX.

RETAINING walls are walls which are built for the purpose of supporting a more or less moveable body behind them, which may be water or earth of various kinds. If the earth or rock is of such a nature as to be able to support itself with a vertical face, and needs only protection against attacks of the weather, the wall is then called a face wall or breast wall. Thus, the retaining wall has to resist a pressure behind it, but the breast wall presumably has only its own weight to carry.

In the case of retaining walls, therefore, we have to consider what effect the pressure of the earth or water behind the wall has on its stability. The force exerted upon the back surface of the wall is clearly one tending to overturn the wall about its base, and the manner in which this force acts is not quite the same in the case of earth and water.

Architects do not often have to deal with retaining walls intended to support a weight of water except of small depth, as in the case of swimming baths, but as the investigation of the overturning effect of still water on the back of a retaining wall is simple, we shall do well to commence our study with that problem. And we will take, first of all, the case of a retaining wall with vertical back. The pressure of the water upon this vertical surface is, in accordance with the laws of hydrostatics, at right angles to the surface exposed to the pressure, and directly proportional to the depth below the surface. If we suppose in Fig. 1 that AB represents the height of the water at the back of a retaining wall, then, as the pressure varies directly as the depth of the water, it is clearly greatest at the point B, and gradually diminishes to nothing at point A. If we represent the pressure at point B by a line drawn to scale BC, equal to the depth of the water AB, and join CA, we shall have the triangle ABC, representing the total pressure on any line at the back of the wall. And by measuring the perpendicular distances on AB to AC, we shall have the pressure at any point in the height of the wall proportionate and on the same scale as we originally drew BC. The resultant, therefore, of these varying pressures of the water at various depths will pass through the centre of gravity of triangle ABC, which, as we know, is one-third the distance from the base BC to A, that is, one-third of the height from B to A, where we have the point E in our figure. The pressure, therefore, on the back of the wall is the area of the triangle ABC multiplied by the



length of the wall. The area of our triangle ABC is

$$AB \times \frac{BC}{2},$$

and as water weighs $62\frac{1}{2}$ lb. per cubic foot, the pressure on one foot run of the wall is

$$AB \times \frac{BC}{2} \times 62\frac{1}{2},$$

Calling the pressure P we have

$$P = 62\frac{1}{2} \times \frac{AB \times BC}{2} \\ = \frac{62\frac{1}{2} AB^2}{2} - \frac{62\frac{1}{2} H^2}{2},$$

where H is the depth of the water.

If the face of the wall towards the water is not vertical, but battered, the pressure is no longer horizontal, but, as we have above stated, at right angles to the surface of the wall. We should therefore have the arrangement as in fig. 2, where the maximum pressure is at the bottom of the wall, at the point D, but at right angles to AB, and we should therefore draw the triangle ABC, with BC equal to H, the depth of the water, and at right angles to AB. As before, the point of action of the resultant of the varying pressures will be E, and its direction passing through the centre of gravity of the triangle, ED is therefore, one-third of AB. The pressure on each foot run of the wall will be, as before, the area of the right-angled triangle ABC multiplied by $62\frac{1}{2}$ lbs.—i.e.:

$$P = \frac{62\frac{1}{2} \times AB \times BC}{2} = \frac{62\frac{1}{2} AB \times H}{2}.$$

Thus we see that, in any case, whatever be the angle of the wall towards the water, the pressure is on each foot in the length of the wall, $62\frac{1}{2}$ lb. multiplied by the product of the height of the exposed face AB and the depth of the water, whilst the point of application is one-third of the height of the wall from the bottom of the water, and the direction of the pressure of the water is at right angles to the face of the wall.

Knowing these data about the pressure of the water, we can then estimate the stability of the wall to resist that pressure. The force by which the wall opposes the overturning tendency of the pressure of the water is its own weight, which necessarily acts vertically downwards through the centre of gravity of the wall. And if, as in fig. 3, we draw the direction P of the pressure of the water and W the direction of the weight of the wall, we can then find by the parallelogram, or triangle of forces, their resultant R, and the direction of that resultant will inform us as to whether the wall is sufficiently strong to resist the pressure of the water or not. When the direction of R passes through the point D, the bottom of the external face of the wall, the pressure is just on the point of overturning the

wall. As in the case of our investigation of the stability and line of pressure of an arch, so in the case of a retaining wall, especially one intended to support a body of water, a margin must be allowed, and the direction of the resultant R should pass the horizontal line through D not nearer than one-third of the thickness of the wall at its base, that is, the horizontal line through D.

The designing of retaining walls to support a mass of earth is not by any means so simple as in the case where water is to be the material supported. In the case of earth there is always some angle at which it will form a sloping bank without extraneous support other than that it receives from the soil at the foot of the bank, except in those cases where the earth is mixed with so much water as to be practically fluid, a state of things that may exist in the case of liquid mud or quicksand. The angle at which earth will form a bank varies with its composition, its thickness or solidity, and its dryness or dampness. It is a matter of common observation that after more or less prolonged wet weather banks of earth frequently slip and take up a lower angle than that at which they were originally made.

The angle at which a mass of earth will remain without movement is called its natural slope or angle of repose, and as long as the earth has its surface formed into a bank not exceeding that angle it needs no retaining wall. If, however, we desire to support the earth at a greater angle than its own slope or angle of repose some extraneous support must be given to it, and to afford this extraneous support is the object in general of retaining walls. The load which such retaining wall has, therefore, to support is that of the superincumbent mass of earth above the natural slope or angle of repose. And if we imagine, as in fig. 4, a retaining wall ABCD, the weight of earth which that wall will have to support will be the weight of the triangle BDE, ED making an angle E D F with the horizon equal to the angle of repose, ED being the natural slope of the earth in any particular case. The force, therefore, which is tending to overturn the wall is that which may be represented by the dotted line and arrow W, being the effect of the weight of the superincumbent mass of earth tending to slide along the slope D E.

ALTERATIONS, BLACKBURN EXCHANGE.—Certain alterations are to be carried out for the improvement of the Blackburn Exchange. The alterations consist of the removal of the present stage, and building in its place a gallery capable of holding about 350 people. The new stage will be built at the King William-street end, and will communicate by means of a bridge with one of the rooms belonging to the present Assembly Rooms, which will form a retiring or ante-room. Messrs. Marshall & Dent are the contractors, and the work is to be carried out under the superintendence of Mr. James Bertvislie, architect.

GENERAL BUILDING NEWS.

ALTERATIONS AT ST. PETER'S CHURCH, NEWTON-LE-WILLOWS, LANCASHIRE.—After considerable alterations St. Peter's Church, Newton-le-Willows, was re-opened recently. The work of building the nave has been carried out by Mr. W. Winard, of Wigan, in accordance with designs prepared by Mr. Brierley, of York.

TOWER, NOLTON CHURCH, BRIDGEND.—The apex stone of the new tower and spire of Nolton Church, Bridgend, was fixed recently. The height of the spire to the top of the weathercock is 143 ft. The work has been carried out by Messrs. Turner & Sons, of Cardiff, under designs by Mr. F. R. Kempson.

CHURCH, HUNCOTE, LEICESTERSHIRE.—On the 3rd inst. Lady Mary Glyn laid the foundation-stone of a new parish church for Huncote, to be called St. James's, and occupying a site adjoining the Narborough-road. There are not sufficient funds available at present to complete the whole of the edifice as designed by Mr. Francis Bacon, of Newbury, Berks, at an estimated cost of 2,500l., but sufficient money has been obtained to warrant the building of the chancel and part of the nave, and it is this portion of the church that is now being proceeded with. The cost of this will be 1,325l. The new church will be built with Huncote granite, relieved with white stone dressings. The builder is Mr. Thomas Herbert, of Leicester.

RESTORATION OF MACCLESFIELD PARISH CHURCH.—The restoration of Macclesfield Parish Church is to be commenced at once. The work will be carried out under the supervision of Sir Arthur Blomfield. The cost will be about 17,000l.

NEW CHURCH, HOYLAK, CHESHIRE.—The foundation stone of the new Church of St. Hildeburgh, Hoylake, has just been laid. The nave and aisles of the church have so far advanced that the roofing may be commenced, but the foundation stone was laid in the chancel, which has only just been started. The architect is Mr. Edmund Kirby. The building is built of Ruabon brick, and the windows, which are wrought in terra-cotta, are purposely designed to suit subjects for stained glass. The cost of the church will be about 6,000l., and it will provide accommodation for some 500 people. The clerk of works is Mr. Kay.

BAPTIST CHURCH, KING'S HEATH, WORCESTERSHIRE.—The opening services of the new Baptist church at King's Heath took place a few days ago. The new church is 72 ft. long by 43 ft. wide, and will accommodate about 500 persons. The materials used are Leicestershire bricks, with Hollington stone dressings. Internally the church has an open timber roof of pitch pine. The floor is on an inclined plane. Vestries are provided for the minister, deacons, and the choir, and there is also a ladies' room. The work has been carried out by Messrs. James Moffat & Sons, from the designs and under the superintendence of the architect, Mr. A. Harrison, of Birmingham.

METHODIST CHURCH, CARLTON, NOTTINGHAM.—A new building for the United Methodist Free Church Persuasion has just been opened at Carlton. The church is capable of seating 450 persons, and in addition there is a school adjoining, which, with the class-rooms, affords accommodation for about 300. Messrs. R. C. and E. R. Sutton were the architects. The principal entrance to the church is from the Main-street, and to the schools from Cromwell-street. The facings are of red sand brick with stone dressings. The contract for the buildings was let to Mr. John Lewin.

WESLEYAN CHURCH, CARDIFF.—A new Wesleyan church has just been opened at Clare-gardens, Riverside, Cardiff. The building has been carried out by Messrs. Cox & Bawr, from the plans of Messrs. Habershon & Fawcner, at a cost of about 2,800l. Accommodation is provided for about 700 persons, and the church is capable of further enlargement when need necessary.

SCHOOLS, ABERDEEN.—The Aberdeen School Board are about to erect a new school at Old Aberdeen, in Dunbar-street. The building will be a granite structure, with Kennaugh stone dressings, and two stories in height. The architect is Mr. J. A. Ogg Allan. The cost is estimated at about 5,500l.

SCHOOL, GREENOCK.—Ardgowan new school, Greenock, was opened recently. The new edifice, which occupies a site at the corner of Brisbane, Nelson, and Tennant streets, is a building of three stories. The ground floor of the school is taken up with class-rooms for the Oral School for deaf mutes, teachers' rooms, janitors' apartments, covered play-grounds for girls, cloak-rooms, &c. The first floor has five class-rooms, and the flat above seven class-rooms. Altogether the school affords accommodation for 1,100 scholars. Mr. James B. Stewart, Greenock, was the architect.

BOARD SCHOOLS, HARTLEPOOL.—The new schools erected by the Hartlepool School Board on the 3rd inst. The buildings have been erected at a cost of about 6,000l., from plans prepared by Mr. James M. Bottomley, architect, of Middlesbrough, and are to accommodate 250 boys and 250 girls of the higher standards only.

WESLEYAN SCHOOLS, FELLING, DURHAM.—The new Wesleyan schools at Felling have just been opened. The schools, which are situated at Holly Hill, are capable of seating from three to four

hundred scholars. The building, which has been erected from the designs of Mr. J. W. Frazer, of Newcastle, is of Heworth Burn stone, roofed with Westmorland slates.

CHURCH DAY SCHOOLS, KETERING.—The foundation-stone has just been laid of new schools at Kettering, which are to form a part of the organisation of the St. Mary's district. Messrs. Blackwell & Thompson, of Kettering, are the architects, and Mr. H. Martin, of Northampton, is the builder. The schools will be on the two story principle, the top floor being used for a girls' school, and the lower for infants. In the infants' department there will be room for 350, and in the girls' school 358. On each floor will be a central hall, and provision is made for extending the floor space by adding the class-rooms to the main hall by means of removable partitions.

CONSUMPTION HOSPITAL, BRIDGE OF WEIR, N.B.—A new Consumption Hospital is being erected at Bridge of Weir. The centre portion of the building is three stories, and the flanking portions two stories in height. The public entrance is at the rear. There is a porch, through which the vestibule is entered. From this a corridor is reached, 7 ft. 3 in. wide and 110 ft. long. To the left of the corridor is a room for the plunge and inhalation baths. Lavatories adjoin the bath-rooms. On this floor there are nine wards, each made to accommodate one or two patients at most. The walls, rounded at the corners, are covered with hygienic plaster. In corridors and wards alike the floors are of pitch pine, varnished. At each end of the corridor there is a ward for two patients. An attendant's room, a room for nappery, and a laboratory are on the same floor. On the first floor area are a dining-hall, 30 ft. by 20 ft., nine wards and single apartments for patients, matron's bedroom, and attendant's room. The upper floor, which is in the central portion of the block, contains the kitchen, two rooms for nurses, and two rooms for convalescents. The walls of the staircase leading to the basement are covered with enamelled brick or tile. The executive buildings are situated in a range of houses occupying a site 120 ft. by 96 ft. over the rising ground behind the hospital. The whole suite of baths—Turkish, Russian, wash-room, inhalation-room, tepidarium, soil bath, and sun bath—are connected with this place, as well as with a laundry and a mortuary. Adjoining these, to the east, there is a residence for the workers. The contractors are—George Earls & Co., masons; William Forbes, plasterer; and Matthew Henderson, joiner. Mr. R. A. Bryden is the architect.

PUBLIC BATHS, ALLOA, N.B.—New public baths have just been erected at Alloa. The building contains the following departments, viz.:—Billiard and amusement rooms, swimming pool, class-rooms, first and second-class plunge-baths, Turkish baths, Russian bath, and gymnasium. On the ground floor, and immediately on each side of the main entrance, are the billiard and amusement rooms, and beyond the entrances to these rooms is the booking and towel office. A wide corridor in front of this office gives access to the other departments of the building. The swimming-pool hall, extending from this corridor through a vestibule, is 98 ft. by 50 ft., having an open timber roof averaging 25 ft. high from the floor. The pond is 75 ft. by 32 ft. On each side are dressing-boxes. A dressing-room and washing-room for school children are provided at the entrance end, and a washing-room for adults, with the usual conveniences, is situated close to the club-room. The second-class plunge-baths—seven in number, on a slightly lower level than the pond—are entered from the main corridor. The first-class baths are on an entire floor immediately over the booking office, and are reached from the same corridor by a stair. The Turkish bath department, and the Russian bath adjoining, are at the far end of the swimming-pond. The gymnasium is 76 ft. by 38 ft., having an open timber roof, with an average height of 22 ft., occupies the whole of the first floor of the front building, over the billiard and amusement rooms, and is provided with the necessary dressing-rooms. A gallery is placed at the one end. The washing-house and laundry are placed behind the heating department. All the rooms have been fitted with lamps for electric lighting; this work has been carried out by Messrs. Mavor & Coulson, Limited, Glasgow.

Messrs. Burnet, Son, & Campbell, of Glasgow, were the architects.

MASONIC TEMPLE, TORQUAY.—A new masonic temple is being erected at Torquay. The building will be Gothic in style, and mainly of red sandstone, with Bath stone dressings. On the ground floor will be a dining hall 38 ft. by 23 ft., the entrance hall 9 ft. by 15 ft., a kitchen 18 ft. by 14 ft., pantry and offices. Above will be the main hall, 24 ft. by 23 ft., a reception-room 18 ft. by 14 ft., a small ante-room, steward's store, &c. Messrs. Bridgman are the architects, and Mr. S. Hawkins the builder.

ORGAN CHAMBER, FAULS, SALOP.—On the 30th ult. the foundation stone was laid of a new organ loft, the foundation stone was laid of the site of the church at Fauls, in memory of the late Rowland Clegg, 3rd Viscount Hill. Mr. B. Edmund Ferrey, of London, the architect of the church, was also engaged on the present occasion, and the builder was Mr. G. Dodd, Whitchurch.

PALACE THEATRE, BLACKBURN.—This theatre, which is shortly to be erected on the site of the corner of Jubilee-street, Bridge-street, and Dandy-walk, opposite the railway station, will be con-

structed externally of Yorkshire stone dressings and Accrington red bricks. Seating accommodation will be provided for about 2,500 persons. The principal entrance will be from the Esplanade in Bridge-street, and side entrances and exits are to be provided in both Dandy-walk and Jubilee-street. On the ground floor level will be the stalls, approached from the main entrance, and a raised amphitheatre-shaped pit. The first circle will be reached from the entrance, and on this level will be boxes, some next to the proscenium, and a range of others directly facing the stage, placed on the higher level of the first circle. Above this will be the gallery. The theatre throughout will be lighted by electric light. The architects are Messrs. J. T. Wimperis & Arber, London.

BUSINESS PREMISES, NEWCASTLE.—On the 2nd inst. a new furnishing warehouse was opened for Messrs. S. Kipsey & Co., at 50 and 52, Northumberland-street, Newcastle. Steel has been largely used in the construction of the building. The architect of the new premises was Mr. W. Lister Newcombe, the contractor was Mr. James Lunn, the steelwork was executed by Messrs. Somerset & Co., the plumbing by Mr. Robert Herron, the painting by Mr. Neil, the plastering by Messrs. Edward Tubb & Son, and the fittings by Mr. James Smart.

BUSINESS PREMISES, PERTH.—A new block of buildings is to be erected by Messrs. W. B. & J. B. Deas at the corner of County-place and New-row, Perth. The building consists of three stories besides the ground floor, the latter being devoted wholly to shops and offices. Mr. G. P. K. Young is the architect.

TOWN HALL, ENNISKILLEN.—The foundation stone of the new Town Hall at Enniskillen has just been laid. The contractor is Mr. James Harvey, Messrs. Anthony Scott & Son, Drogheda, being the architects.

ALMSHOUSES, TAUNTON ST. JAMES, SOMERSETSHIRE.—The new almshouses, erected for the parish of Taunton St. James are now completed. The new houses are situated a little way back from St. James's-street, on land adjoining the disused churchyard. The houses provide accommodation for six married couples or single persons, as the case may be, and they are arranged in pairs. The living rooms are in each case on the ground floor, and the bedrooms of each pair are approached by a common staircase. The living rooms are 12 ft. by 10 ft., and the bedrooms are about the same size. The houses are built of red Bridgewater bricks and are roofed with dun-coloured tiles. The bricks are relieved by string courses of Bath stone. To each pair of houses is a porch, and the windows are glazed with diamond panes. The architect was Mr. J. Houghton Spencer, Taunton. The contractor was Mr. T. H. Moggridge. The amount of the contract was 1,116l.

STAR HALL INSTITUTE EXTENSIONS, FINEDON, NORTHAMPTONSHIRE.—The large new hall adjoining the Star Hall Institute, Finedon, has just been opened. This building, which is 60 ft. by 38 ft., adjoins the old premises; it will accommodate nearly 500 people. Messrs. Mosley & Anderson, of Northampton, were the architects. Mr. A. J. Ball was the builder.

HOME, EDINBURGH INDUSTRIAL BRIGADE.—A new Home is in course of erection for the Edinburgh Industrial Brigade. On the Fountainbridge and Ponson-street frontage the building will consist of four stories and a basement, and towards Thornycroft there will be three stories. The Fountainbridge frontage will have several shops. The House will occupy an area of about 815 yards, and will be built round an open court. On the first floor a Directors' and ladies' room, as also a reading and play room for the boys, will be placed. On the second floor there will be the Senior Superintendent's house, and on the third floor there will be the Assistant Superintendent's house, with a sick-room cut off from the rest of the building. The main entrance to the Home will be from Ponton-street, and on the ground floor there will be placed the dining-hall, with service-room, kitchen, &c., while above there is a large hall for meetings. On the second and third floors are the dormitories for the lads. On the Thornycroft side there will be on the ground floor the laundries, bathrooms, and lavatories, and on the first and second floors the dormitories, with dressing-rooms and lavatories, will be provided. The access to the various floors will be from a central hall and staircase. The new building will provide room for 150 boys. The site for the building has cost 3,000l., and the estimated amount to be expended on the building has been prepared by, and the whole will be carried out under the direction and supervision of, Mr. Frank W. Simon, architect.

PUBLIC BATHS, GRANGETOWN, MIDDLESBROUGH.—The foundation stone has just been laid of the new public baths at Grangetown. The plans were prepared by Mr. J. M. Bottomley, architect, of Middlesbrough, and the contract for such portion of the scheme as it was thought advisable to provide at once was undertaken by Messrs. Bastiman Bros., of Middlesbrough. The site is located at the corner of Pochin-road and the Market-place. It has a frontage of 92 ft. into Pochin-road, and a uniform depth of 60 ft. The entire scheme comprises a suite of slipper baths in the centre, flanked on the north side by a swimming bath and on the south side by public laundry and wash-houses, the latter facing into the Market-square. It is, however, only proposed at present to proceed with the central block,

which has a frontage of 42 ft. into Pochin-road and a depth of 60 ft. Separate entrances are provided for the men's and women's departments respectively, a pay-office being placed between them, and waiting-rooms on each side. In the men's department there will be eight slipper baths, while six others will be provided on the women's side. In the south-west angle, below the level of the street, is the heating chamber, where boilers will be fixed for serving the baths with hot water. On the first floor will be placed the caretaker's rooms. At the rear of the scheme be decided upon at any future time, the laundry and washhouses will have a frontage into Pochin-road of 22 ft., while the swimming bath will have a frontage of 28 ft.

CONVALESCENT HOME FOR NURSES, BUSBY, GLASGOW.—The Convalescent Home for Nurses, instituted at Busby out of funds provided for the purpose by the late Dr. Samuel Johnstone Moore, is now nearly completed. The buildings consist of the main house to be occupied as the nurses' home, and a cottage adjoining which is to be occupied for disinfecting purposes. There is a washing-house, a drying-house and laundry, a gardener's house, and a gate lodge. The main house is built on sloping ground. The front doorway leads to the entrance hall, cloak-room, and lavatories. From the hall a staircase leads to the upper floor. On one side of the upper corridor are the nurses' sitting-room and dining-room, as well as the matron's room; on the other are the kitchen and kitchen offices. There are also bedrooms on the upper floors. The cottage used for disinfecting purposes contains dining-room, kitchen, six bed-rooms, and bath-room. All the arrangements have been carried out under the superintendence of Mr. Frank Burnet, architect.

STAINED GLASS AND DECORATION.

WINDOW, ST. MARK'S PARISH CHURCH, DUNDEE.—A memorial window has been erected in St. Mark's Established Church, Dundee, in memory of the late George Jarvis Bell, of Belmont, and William Kidd. The work has been executed by Messrs. Stephen Adam & Son, Glasgow.

WINDOW, ST. MAGNUS CATHEDRAL, KIRKWALL.—There has been placed in St. Magnus Cathedral, Kirkwall, a stained-glass window to the memory of the late Provost Thomas Peace. The subject depicted is Christ's story of the good Samaritan. The work was executed by Messrs. Ballantyne & Gardner, Edinburgh.

ST. GILES, NEWCASTLE, STAFFORDSHIRE.—New oak seating has been placed in the body and south chapel of the Church of St. Giles, Newcastle, Staffordshire, at a cost of 1,000*l.*, to commemorate the Queen's Diamond Jubilee. The work has been executed by Jones & Willis of Birmingham, from the designs of Mr. John Lewis, architect, Newcastle. Staffs. Three front pews on the south side of the middle aisle are allotted to the Mayor and Corporation on the occasions of their official visits. These are elaborately carved, the fronts being open, and there is a special seat and desk for the Mayor, on each side of which ornamental iron standards are fixed for the pews. At the ends of the stalls are carved the Shield of the Diocese of Lichfield, the arms of the Borough, the arms of the present Mayor, the Royal arms, the Diocesan crest impaled with that of the present Bishop, and the arms borne on each of the three charters granted to the Borough. The whole of the seats are of oak, waxed and polished, and the outer panels of each pew bear carved devices.

WINDOW, HAWARDEN CHURCH.—The west window for Hawarden Church, to be erected by the members of the Gladstone family to perpetuate Mr. and Mrs. Gladstone's long connexion with Hawarden, is approaching completion. The subject will be the Nativity, from the designs of Sir Edward Burne-Jones.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The business of the late Mr. John Thompson, the well-known contractor of Peterborough, will now be carried on by his two sons, Mr. Thomas John and Mr. Walter Stuart Thompson, in conjunction with Mr. Walter Hall, all of whom have been for many years practically associated with the business. The firm will now be known as that of John Thompson & Co.

HUDDESFIELD MASTER BUILDERS' ASSOCIATION.—An important banquet in honour of the election of Alderman W. H. Jessop, J.P., to the office of Chief Magistrate of the borough, was given to his Worship by his fellow-tradesmen of the town and district, the master builders, in the Albany Hall, Huddersfield, on the 30th ult. The chair was occupied by the President of the Association, Mr. Abraham Graham. Mr. John Dawson, in proposing the toast of the evening, "The Mayor," alluded to the visitors, and among them the new Borough Surveyor (Mr. Campbell), to whom they gave a hearty welcome to Huddersfield. He then spoke of the Mayor's connexion in different capacities with local institutions associated with the trade, and said that seven years ago there was started in Huddersfield what had proved a most beneficial insurance company on behalf of injured workmen, and their

Mayor had presided over the deliberations of the management in a most able and businesslike way, and had been elected as President of the concern from year to year ever since its commencement. In addition to occupying other important posts in the building trade he was a member of the Council of the National Association of Master Builders of Great Britain.—The Mayor, in reply, thanked them for the warm reception given him, and for entertaining him as their guest that night. He agreed with the proposer of the toast that they belonged to the second largest industry of the country. The wages paid annually in the building trade of the country were something like 50,000,000*l.* He remarked upon the pleasure he had in being a member of the Master Builders' Association of Huddersfield, and of the Federation of Yorkshire. The time was coming when they would be able to meet together and discuss in a more friendly manner the work of their trade than ever they had done before. They knew what troubles they had had to pass through in recent years in connexion with strikes and combinations of workmen, and the only way to meet them was to have sufficient confidence in each other and to act unitedly in defending their interests, so as to carry on their trade in a manner that would be to the welfare, not only of themselves, but also their workmen. He believed they were all anxious to pay a fair day's wage, but what they wanted in return was a fair day's work.—"The Town and the Trades," said the Mayor, "are the two sides of the same coin." He then alluded to the fact that the National Association of Master Builders was submitted by Mr. L. Radcliffe, and responded to by the Mayor and Mr. Biggin (Sheffield). Mr. J. W. Mallinson proposed "The Yorkshire Federation of Building Trades," remarking, in the course of his observations, that at the present time there were eleven associations connected with the Federation, representing from 600 to 700 firms. The toast was acknowledged by Mr. W. R. Thompson (Dewsbury). Mr. George Garton next gave "The Architects and Surveyors." Alderman Stocks, responding on behalf of the architects, said if there were more confidence and less jealousy in the trade, they would find more work and better profits would result, and parties all round would be better satisfied than they had been in the past. Speaking as an architect, the man he liked best was he that did work best, and he had always stuck out for a fair price and a fair profit for a man who did his work well. He expressed the hope that the architects of the town would band themselves together in an association as had been done in other towns. Mr. J. H. Hanson replied for the surveyors. "The Visitors" was proposed by Mr. Alfred Crowther, and acknowledged by Mr. R. F. Campbell and Alderman Inman, and the proceedings concluded with a vote of thanks to the Chairman, on the motion of Mr. Allen Jackson, seconded by Mr. S. Hanson.

WEST OF ENGLAND BUILDERS' FEDERATION.—Mr. A. Krauss, of Bristol, presided at the annual meeting of this Federation, held at the Bath Athenaeum, on the 3rd inst. The Secretary (Mr. H. J. Spear) read the report, which stated that the Federation was established on April 6, 1897, and that the objects of the Federation were: "To secure full discussion of, and, where practicable, the adoption of a common policy in regard to questions that may from time to time be raised affecting the trade; to defend the interests of its members against combinations of workmen seeking by strike, or other means, to impose restrictive conditions on the trade; to secure united action and provide mutual support in dealing with any attempt such combinations may make to impose unfair terms on individual employers or districts; to establish branches of the Federation in towns and districts where they do not already exist; to generally guard the interests of the trade, and obtain fair and equitable treatment from architects in relation to quantities and conditions of contract; to raise and maintain a common fund, to be applied and used in carrying out the objects herein stated." An important sequel to the formation of the Federation would, no doubt, be the general establishment of local associations, which at present were few and far between. It was the most mistaken notion possible for men in any trade not to combine personal friendliness and business rivalry, which were as perfectly compatible in the building trade as in any other, and the idea of brother tradesmen treating each other as personal enemies was a wrong, and, moreover, an unpaying policy. This Federation is now represented by the following towns:—Bath, Bridgwater, Bristol, Cardiff, Newport, Plymouth, Taunton, and Weston-super-Mare, and other centres have promised to become federated. The only dispute of any note that has come under the notice of the Federation was that of the stone masons at Cardiff, and the Federation resolved to stand loyally by the Cardiff master builders. At the half-yearly meeting of the Federation, held in Bristol in November last, the Bridgwater Association proposed:—"That in order to meet the risks and expenses incurred by contractors through the Employers' Liability Act, the Federation recommend that a sum to cover the premium of the insurance against employers' liability should be stated in bills of quantities, the same as fire insurance, and that the same should be paid by the employer instead of the contractor." The Federated Associations have been requested to take the opinion of

their local architects upon this point. With reference to the Workmen's Compensation Act, numerous circulars have been issued by the various insurance companies, dealing with this question, which point out that by unity of action on the part of all the members of this Federation, they would be able to secure lower rates than those granted to individual builders, and the first step in order to secure this will be to inform the insurance companies of the total amount of wages paid annually in the building trade, within the area covered by the Federation during the past two or three years. Therefore the secretaries of the associations are requested to inform the secretary to the Federation, in confidence, the amount paid by their members in respect of wages during that period, and he will notify the offices of the lump sum (without mentioning names) paid by the Federated Builders in the shape of labour expenses.—In moving the adoption of the report, the Chairman said that since the principal towns in the West of England had belonged to the National Association, and had formed themselves into a Federation, there had sprung up a much closer friendship between them as employers than there had ever been before, and he sincerely hoped that that friendship would increase, as it had strengthened their cause in the various difficulties they had to contend with. As regards the Employers' Liability Act, which comes into force on July 1, they had, as proposed by a majority of friends, approached the Bristol Society of Architects, that in future a clause should be inserted in the bill of quantities, the same as a fire insurance clause, so that the same shall be paid by the employer instead of by the contractor, and this same line had been taken up by the other federations, and a satisfactory result was expected. At a meeting of the Council meeting held at Derby, a resolution was proposed and agreed to that the different counties in Great Britain should be divided into four county federations. The West of England (subject to any alteration to meet local requirements) consists of the following counties:—Hereford, Monmouth, Gloucester, Wilts, Somerset, Dorset, Cornwall, and Glamorgan, and the sub-committee had taken steps to settle the boundaries, and to make full arrangements, and to report for the next month's special meeting at Derby. He asked them all to do their best to get all towns in their neighbourhood to join the Federation. With reference to the Workmen's Compensation Act, up till now they could not get for certain what percentage they would have to pay after July 1; some thought 30*s.*, others 40*s.*, and others 50*s.* per 100*l.* wages; but the Builders' Accident Insurance had given them a fixed sum, viz., 15*s.* per 100*l.*, to fully insure against all three Acts; the extra risk would be taken on for any amount they wished to insure for; 15*s.* insurance represented 3 per cent., and the extra risk for insurance they must never calculate less than 1½ to 2 per cent. in future contracts.—Mr. Symonds seconded, and the report was adopted, as were also the accounts, which showed a balance in hand of 17*l.* On the motion of Mr. Harris, seconded by Mr. Hayward, Mr. Symonds was unanimously elected President for the ensuing year. Mr. Wooster was elected Vice-President, on the motion of Mr. Krauss, seconded by Mr. Shorkey. Mr. Linton (Newport) was re-elected hon. treasurer, and Messrs. Harris and Mercer auditors. A discussion took place on the trade against accidents, Mr. Kitch feeling that a clause in the contract a percentage should be allowed for accidents should be inserted. Mr. Church said a large contractor stated at the National Council that he should add 2 per cent. to all his contracts, whether he got them or not. Some members suggested that insurance amongst the trade in a town could be effected, but the Chairman did not think so. They had tried in Bristol, and failed. He felt insurance in a good company was the best. Bridgwater was chosen for the next meeting, and a vote of thanks to the Chairman concluded the meeting.—*Western Press.*

BUILDING REGULATIONS IN GLASGOW.—The Fire Brigade Committee of the Glasgow Corporation, at a recent meeting, considered the building regulations in force in the city, and came to the finding that the time had arrived when workrooms with ten employees or upwards be inspected to ascertain if the exits are sufficient. It was also felt that additional powers should be obtained under the Factory and Workshops Act for inspection of factories; and it was meantime agreed to make a recommendation to the Dean of Guild Court that plans should not be passed until a docket was produced, signed by the Master of Works and the Chief of the Fire Brigade, showing that sufficient exits were provided.

APPOINTMENT.—At a special meeting of Stirling Town Council recently, for the purpose of appointing a master of works for the Burgh in room of Mr. F. G. Holmes, who has been appointed Burgh Surveyor of Govan, the following short list was submitted:—Charles Brown, Burgh Surveyor, Airdrie; S. W. Dalzell, civil and mining engineer, Port Glasgow; Andrew H. Goudie, assistant master of works, Paisley; Edward Twist, civil engineer, Donabate, Ireland; Prittle, Burgh Surveyor, Selkirk; and Charles Massie, C.E., master of works department, Glasgow. Mr. Goudie was elected.

THE COUNCIL CHAMBER, BRISTOL.—According to the *Bristol Mercury*, there are serious complaints amongst the councillors about draughts in the

council-chamber. The excessive draught in the chamber has led to inquiries, which have resulted in the explanation that the special electrical ventilation apparatus provided on the plan of Professor Wertheimer has never had a real chance of justice being done to it. This arises, the *Mercury* states, "from the fact that it is so scientifically arranged and adjusted for precise conditions that the moment these conditions are broken, the delicate arrangement of the apparatus is dislocated and its effect entirely lost. It is stated that it was designed for a room with closed doors, and the ordinary ventilators in the walls of the hall intended to admit fresh air should be left open. But the practice is for all these ventilators to be closed, as the room is felt to be too cold, and then only too often the doors at the extreme end are thrown open. Immediately these conditions prevail the whole effect of the electric ventilator is subverted, with the result that an insufferable draught is generated."

THE METROPOLITAN ASYLUMS BOARD.—A meeting of the Metropolitan Asylums Board was held on Saturday last, Sir E. Galsworthy presiding, at the County Hall, Spring-gardens. A letter was read from the Local Government Board stating that the report of the Special Committee re Brook Hospital expenditure "does not contain specific replies to the several questions asked in their letter of October 22, 1897;" that the Committee did not employ a competent surveyor as suggested by them, and as ordered by the managers; and that they "are still of opinion that the course suggested by them should be adopted, and that they will be glad to receive the information asked for in regard to each of the points referred to in their letter." Mr. White said he was afraid the Local Government Board had not given sufficient attention to the Committee's report. He would move that a letter be sent to the Board directing their attention to the particular points thoroughly dealt with in the Committee's report. He was sure that if the Local Government Board went carefully through the report, they would see that the questions they asked had been fully answered. Mr. White proceeded to read a draft letter informing the Local Government Board that the circumstances under which departures from the contracts were made were fully set forth in the report, and that the managers had nothing to add in explanation. When the tenders were accepted the managers appointed a committee to exercise a general supervision whilst the works were in progress, but it was obvious that they could not be expected to know whether the works were being carried out strictly in accordance with the specifications, except when their attention was directed to it by the architect. Immediately the Hospital Committee were aware of the differences between the amounts of the tenders and the amounts certified for payment, they applied to the architect, received a detailed statement, and subsequently appointed the special committee of inquiry. The reason why the committee did not adopt the suggestion of the Local Government Board to employ a competent surveyor was fully stated in the report. The managers had endorsed the action of the committee, and they were still of opinion that the work having been measured by independent quantity surveyors, and there being no reason to suppose that the managers had not received value for their money, no useful purpose would be served by incurring the expense suggested. Mr. White added, by way of comment, that it had been clearly established that the architect had exceeded his instructions, and was principally responsible for what had occurred. Mr. Jackson Hunt seconded the motion. Mr. Brass moved that the consideration of the matter be adjourned for a fortnight, and that in the meantime the letter drafted by Mr. White be printed on the agenda. He protested against the question being dealt with in a hurry, and before they had had time to fully comprehend the numerous points in Mr. White's letter. Only a month ago a resolution was passed to the effect that legal opinion should be taken with regard to the liability of the architect for extra work ordered or allowed by him on his own responsibility, and now that order was to be "discharged." As to the cost of the proposed inquiry, it was nothing as compared with the enormous extra expenditure on the hospital which the committee were making so coolly. Admiral Adeen seconded. Mr. Purches said they had better institute an inquiry by an independent surveyor, or the Local Government Board would do it for them. The amendment was then agreed to. The report of the General Purposes Committee, containing the following, was formally presented and passed:—At a meeting of the Board on March 26 last, the report of the special committee re Brook Hospital expenditure, together with all reports and other documents having reference thereto, was remitted to us with instructions to take legal opinion as to the liability of the architect to refund to the managers all or any portion of the cost of the extra works or claims ordered or allowed by him on his own responsibility. As, in our opinion, the instruction thus conveyed to us by the Board would involve the managers in very considerable expense, and would serve no useful purpose, we recommend: "That so much of the reference from the Board of March 26, 1898, as instructs the General Purposes Committee to take legal action in the matter of the Brook Hospital expenditure be discharged; and that in lieu thereof the Committee

be authorised to take counsel's opinion as to the liability of the architect with regard to the claims of the contractors allowed by him in respect of delays."

YORKSHIRE BUILDERS AND THE COMPENSATION ACT.—A meeting in connexion with the Yorkshire Federation of Builders' Associations was held at Keighley on the 6th inst., when the principal speaker was the Mayor of Huddersfield (Alderman Jessop). In alluding to the Workmen's Compensation Act he prophesied that many of the smaller contractors would be ruined by the increased demands of the new Act, in the event of a few unfortunate accidents occurring, unless they had their workmen insured. He thought it was coming to this—that contractors would have to specify an allowance for insurance when making out their estimates for contracts.

CAPITAL AND LABOUR.

STONEMASONS' STRIKE, MID-CHESHIRE.—The strike of stonemasons in Mid-Cheshire, which commenced recently, was brought to a satisfactory close on the 4th inst., the masters and men agreeing to a compromise. The men asked for 9d. per hour in lieu of 7½d., and a nine hours instead of a ten hours' day. The whole of the employers have now agreed to pay 8½d. per hour without any reduction of hours, and on these conditions the Stonemasons' Society have agreed.

MASONS' STRIKE AT SWANSEA.—The master builders of Swansea, except in one or two instances, not having granted the masons' demand for an increase in pay of from 8d. to 9d. an hour, the men came out on strike recently. The contractors for the parish church and the east dock extension conceded the advance asked for, but only a very small percentage of the masons of the towns are employed at these two places. Cardiff masons are at present paid 8½d. per hour, so that the local men are asking for a ½d. per hour more than the masons in the sister town are in receipt of.

BRICKLAYERS' WAGES, BLACKPOOL.—The six months' notice to the Blackpool master bricklayers for one penny an hour increase in wages terminated on the 30th ult. The rod, an hour had been agreed to, but some masters wanted the insertion of the word "competent" before the word "bricklayer" in the rules. This the men objected to; only one or two masters, who employ about seventy bricklayers between them, have refused to sign the rules. In Blackpool there are about 400 members of the Bricklayers' Society, and the seventy men who have come out on strike will receive support from the society whilst out.

MASONS' AND BRICKLAYERS' DISPUTE, TIVERTON.—A number of masons and bricklayers, members of the Tiverton branch of the Operative Bricklayers' Society, have come out on strike for the following reasons. They demand a revision of the working rules and an increase of wages from 5½d. an hour in the case of some and 5½d. in the case of others, to a minimum rate of 6d. per hour. The rate paid in Exeter to masons and bricklayers, they say, is 8d. an hour, and it is therefore contended that the request for 6d. an hour in Tiverton is only reasonable. In accordance with the rules agreed on between masters and men, three months' notice of the demand was given, and the notice expired on May 1. The disputes affect about eleven firms and thirty men. The Masters' Associations have refused the request of the men.

CATERHAM AND BRICKLAYERS' WAGES, CATERHAM.—The master builders of Caterham have conceded ½d. per hour advance, with a code of working rules, to carpenters and bricklayers.

MASONS' STRIKE, PRESTON.—Among several other towns in Lancashire, Preston is affected by the present dispute in the stonemasonry trade. One or two firms in the town have already conceded the demands of the men. Briefly put, the question is as to worked stone. The men ask that all stone should be worked in the town where it is set. About 100 men are out in Preston. Six months ago the operatives gave notice demanding a penny an hour advance; higher pay for overtime; the introduction of a rule requiring that only masons should work machines, and that machines should only work so many hours per day. The masters thereupon gave counter notice removing all restrictions on the use of ready worked and sawn stone, and that one apprentice should be allowed to every three masons, instead of seven, as at present. A meeting was held at which the employers offered the men an increase of one half-penny an hour, making an advance of 9d. per hour, and the retention of the old code of rules with the exception of all stone referring to worked stone. The operatives absolutely declined to entertain the latter, and the proceedings at once terminated.—*Lancashire Post*.

MASONS' STRIKE, LANCASTER.—A lockout or strike commenced at Lancaster on the 2nd inst. affecting the masons. The question at issue, it is stated, is as to the hours of work in the winter months. Last year, the men got an advance of 4d. per hour, making their wage 9d. per hour for 49½ hours a week. The masters then wished to alter the working hours in winter, contending that they were losers by the men working in the dark, but were reminded by the men of the rule requiring six months' notice of change. Meetings have been held to arrange the matter, but without success.

The men state they have given away fourteen hours, and it is agreed that the whole dispute is as to the remaining two and a half hours. The masters are nearly all connected with the recently-formed Building Trades Federation of Lancashire and Cheshire, and the men are organised.

STRIKE OF BLACKBURN STONEMASONS.—On the 30th ult. the stonemasons of Blackburn and district came out on strike for an advance of a halfpenny per hour, and against a proposal of the employers to abolish a rule prohibiting the importation of stone worked in other towns. Nearly all the towns of East Lancashire, as well as Manchester, are involved in the same dispute.

MASONS' STRIKE, BARRY.—For some time past negotiations have been proceeding between the Barry Master Builders' Association and the Masons' Society respecting the operation of a code of rules to govern all work carried out in the district. The Masons' Society gave six months' notice of their intention to introduce this code of rules. That notice expired on the 30th ult. The Association has agreed to all the rules excepting that which seeks to prevent piecework and sub-contracting. The Association represents altogether twenty-eight building firms in the district, and the Masons' Society have already secured the operation of the rules among about thirty-two non-associated employers, and the men in the employ of the latter will continue working. The men claim that the rules are identical with those in operation in Cardiff and other large centres, and are insisted upon in all contracts let by public bodies.

STRIKE OF STONEMASONS, NORTHWICH, CHESHIRE.—On the 2nd inst. the stonemasons connected with the Northwich branch of the Operative Stonemasons' Society, comprising the towns of Northwich, Winsford, and Middlewich, struck for an increase of 1½d. per hour in wages and a reduction of one hour per day in the number of hours worked. At present they only receive 7½d. per hour, and work ten hours per day.

JOINERS' STRIKE AT LEIGH, LANCASHIRE.—On the 2nd inst. the joiners in Leigh, Atherton, and Tyldesley, numbering altogether 100 men, went on strike. Their original demand was an advance in wages of ½d. per hour. The Master Builders' Association agreed to give the Manchester rules and wages, or an advance of from 8½d. to 9d. per hour, a reduction of the week's working hours from fifty-one to forty-nine and a half, and no payment for walking time for distances within one and a half miles. The men refuse to accept the Manchester rules unless an apprentice rule is added, and they consequently struck work.

THE BUILDING TRADE, CLEVEDON, SOMERSETSHIRE.—The expected strike in the building trade has been averted. The masons had given six months' notice of a halfpenny per hour advance, which was acceded to at a meeting of masters. The carpenters had given three months' notice for a similar rise in wages, but the masters objected to short notice. They, however, met the men by a promise of the advance on June 1.

CARPENTERS' STRIKE, WESTON-SUPER-MARE.—A large number of carpenters ceased work recently at Weston on account of a difference with their masters. Their demand for an increase of wages to the extent of ½d. per hour was acceded to, but as the masters insisted upon altering certain of the rules of the society the men decided to go out on strike. At a meeting of the men on strike, a resolution was passed to the effect that no alterations could be made or should be passed in the working rules without the six months' notice required by Rule 9, to which the masters had agreed, being duly given.

THE BRICKLAYERS' LABOURERS' STRIKE AT WARRINGTON.—About one-half of the Warrington bricklayers' labourers who came out on strike recently have now returned to work, the masters having conceded their demand for an increase of wages from 6d. to 6½d. per hour.

PLASTERERS' WAGES, NORTHAMPTON.—The dispute which has for some time existed between the masters in the Northampton building trade and the plasterers has been settled. The masters have offered to increase the wages by the addition of ½d. per hour, which is half the amount appealed for. It has also been agreed to alter one of the rules to read as follows:—That the men be allowed to have one apprentice to two men and two apprentices to four men.

PLASTERERS' STRIKE, TORQUAY.—Plasterers at Torquay to the number of fifty or sixty have struck work for an increase of pay. The best men have been getting 7d. an hour, while others have received 6d. or 6½d. The men ask for 7½d., which they say is the rate at Exeter. The employers offer 7d. as a standard for efficient plasterers.

THE JOINERS' DISPUTE, LIVERPOOL.—In the beginning of November last the operative joiners of Liverpool and district gave notice to the Master Builders' Association, that they required an advance of ½d. per hour, which would be equal to 9d. per hour for journeyman all round. The master builders replied at the time by a counter-intimation of ½d. per hour reduction. According to a rule which has been in existence for some time, six months must elapse before any such notice can take effect, and in the present instance it was due to expire on May 1. In the meantime interviews and negotiations between representatives of each Society have been pretty frequent, but they did not

definite shape till the eve of the day on which notice expired. A meeting, convened by the native Joiners' United Committee, was held in the City Hall, St. Anne-street, under the presidency of Mr. William Shipton, who intimated that the matter had been satisfactorily settled by the bricklayers conceding the point. For the rest, therefore, the standard wage would be 9½d. per hour, as formerly, an advantage in which joiners and slaters were also to share.

ABOUT WAGES AT PETERBOROUGH.—The municipal employees of Peterborough, who, after forty, have presented a petition to the town clerk asking for their wages to be increased a half per week owing to the increased rate of wages which can be obtained at the neighbouring yards at Fletton. The Town Council are very willing to give way on the point, and it is not likely that the matter will be brought to an issue. Shortly, the men contending that they will not accept a rate of payment which is considerably below the standard which brickyard labour has established in the district.

THE BUILDING TRADE STRIKE AT SOUTH SHIELDS.—At a meeting of master builders and operatives of the building trades at South Shields on Monday last, the strike of the bricklayers and slaters were concerned, was practically settled. In respect to the long-standing dispute between the two classes of men as to which was entitled to certain cementing work, it was agreed that cementing and tiling be left to the discretion of the employers, and that the rate per hour to the bricklayers having been promised in consideration of their going to this was thereupon granted. The question of labourers' wages was not settled. Work has resumed at the following rates:—Bricklayers, 10s. per hour; plasterers, 9½d. per hour; labourers, 8s. per hour.

THE STONEMASONS' DISPUTE.—On the 29th of April a general meeting of the Operative Stonemasons of Oldham was held at the Roebuck Hotel, King-street. The meeting was held to consider the demand of the masters that all kinds of ready-dressed stone should be brought into the town. It appears that two years ago an agreement was made by the operative stonemasons and the employers that only rough-hewn stones of worked or half-dressed stone should be imported into the town, and this was signed on behalf of both associations by the respective secretaries. Six months the employers gave notice—in accordance with terms of the agreement, which specified six months' notice of alteration should be given—that they intended to alter themselves at liberty to introduce any kind of dressed stone, and that any employer in another town could bring in the material as long as he paid the standard rate of wages in vogue in his district. The matter has been through various stages, and recently a deputation of the men waited upon a sub-committee of the employers, and their views were fully discussed. The men laid their objections to the proposal before the sub-committee, and particular stress was put on the objection that outside employers might be ready-worked stone to Oldham provided they paid the standard rate of wages of their own district. Subsequently the dispute was amicably settled, the masters stonemasons having decided that steps be taken at present to the worked stone.

THE JOINERS' STRIKE AT BANGOR.—At a recent meeting of the master joiners of Bangor, an agreement was arrived at as to two of the men's demands, namely, that wages are to be paid weekly, and that the men's third demand was as follows:—"That the rate of payment be as follows when able to work time: Inside or outside to be paid for at the rate of 6½d. per hour for fifty-five hours per week, that for thirty-five weeks in the year; the remaining seventeen weeks to be paid for at the rate of 6d. per hour for a week of 47½ hours." With regard to this proposal, the masters resolved as follows:—"That the rate of payment be as follows: When able to work full time inside and outside, five hours per week, at the rate of 6½d. per hour. Outside work to be as follows:—four weeks for fifty-and-a-half hours at 7d. per hour, and twelve weeks for forty-eight hours at 7½d. per hour." The effect this is granting the men's demands, except 6½d. per hour. There are other points, but typically the parties have arrived at an agreement of all of them with the exception of that just mentioned, and here, for the present, both sides remain at peace.

ARBITRATION IN THE NORTH STAFFORDSHIRE BUILDING TRADE.—The members of the Potteries, Newcastle, and Leek branch of the Operative Bricklayers' Association having made a demand for an increase of a penny upon the present rate of 8½d. an hour, and the Master Builders' Association having refused to accede to such demand, the case has been referred to Mr. Talbot Baines, an arbitrator of the Board of Trade. The case for the plaintiffs is that they considered the advance of a half per hour granted by Sir W. Markby Bt. hardly enough under the circumstances, and having submitted to that decision for years, they thought they were justified, in the present state of the building trade, in asking for a revision of the scale.

The case for the builders is that there has been no such change in the trade as to justify the demand made by the bricklayers, and that such demand has been made because the bricklayers thought it was possible that they themselves would receive a notice for reduction of wages from the employers. The stonemasons and bricklayers' labourers had also asked for an increase of 1d. an hour, but the former had accepted ½d., making their wages equal to those of the joiners and bricklayers, and the latter had withdrawn their notices. At an inquiry into the dispute, held at Stoke-on-Trent, the arbitrator endeavoured to effect an amicable settlement, but failed. He said he would give the subject his full consideration, and forward his decision in due course.

DERBY BUILDING TRADE.—The master builders of Derby have, by an amicable arrangement, conceded an advance of one halfpenny per hour, with revised working rules, to the joiners and carpenters.

LEGAL.

CASE UNDER THE LONDON BUILDING ACT, 1894.

At Guildhall, before Mr. Alderman Smallman, Mr. J. Husbands, Basinghall-street and London-wall-avenue, was summoned at the instance of Mr. Edmund Woodthorpe, District Surveyor for the northern division of the City, for that between December 21, 1897, and January 5, 1898, he did counsel and procure one James Atkinson Spencer, of Commercial-road, Lambeth, to contravene a section of the Building Act, 1894, by making an opening in the party wall used for the separation of 4, London-wall-avenue; James Atkinson Spencer, builder, was summoned for contravening Section 77 of the Building Act, 1894, by making an opening in the party wall used for the separation of 4, London-wall-avenue; Mr. Horace Avory prosecuted on behalf of the London County Council; Mr. George Elliott (with whom was Mr. H. Gordon Davies) was for the occupier (Mr. Husbands); and Mr. Archer White represented the builder, Mr. Spencer. Mr. Avory said the Building Act of 1894 was passed for the very purpose of protection from fire, and since the great conflagration in Cripplegate the importance of the matter now before the Court could not be over estimated. The complaint was that an opening had been made in these buildings—buildings which were not in one occupation, and so uniting what were practically two buildings, thus contravening the Act. Mr. Woodthorpe, the District Surveyor, had been asked to give his sanction to this opening being made, but he had refused, and then, advantage being taken of the last Christmas holidays, a door was made on the second floor. No building could be so altered legally except if it were wholly in one occupation or adapted to be so, and evidence would be given to show that it was not. Mr. Edmund Woodthorpe stated that the whole of one of the buildings was in the occupation of Mr. Husbands, but the ground floor was tenanted by Messrs. Singleton & Bender. On December 21 he found a party wall had been made on the first floor, thus connecting Nos. 45a and 46a, Basinghall-street with 4, London-wall-avenue. He had never given his consent to this. Mr. Elliott contended that there was no uniting, because these buildings were practically one, and there was no party wall. Technical evidence having been given, Mr. Benjamin Housgood, the original builder and owner of the premises, said they were built as a speculation, and so either one or more tenants. The case having been argued, the Alderman said: I find as a fact that these buildings were constructed and adapted so as to be wholly in one occupation, and therefore I shall dismiss the summons. I think the case has been very properly brought forward by the District Surveyor and those instructing him, and under the circumstances I do not propose to allow any costs. A second summons was adjourned for a week.—Times.

THE WESTMINSTER BUILDING DISASTER.

At the Coroner's Court, Horseferry-road, on Monday, Mr. John Troutbeck, the Westminster coroner, resumed his inquiry into the deaths of William Clifford Morse, Joseph Henry Parker, Charles Westbury, Ernest George Lillywhite, Hugh John Bray, George Bridge Hillings, and Henry Clements, who were killed through the collapse of a building in Orchard-street, Victoria-street, Westminster, on the 21st ult. Mr. J. L. Blenkinsop, one of her Majesty's Inspectors of Factories, appeared for the Home Office; Mr. A. C. Kent for Mr. W. Rickard, the chief contractor of the works; Mr. E. Thompson for the General Labourers' Amalgamated Union; Mr. G. L. Edwards for the roof contractor, Mr. S. Murrell; Mr. Hugh Fraser for Mr. Drury, the District Surveyor; while Mr. T. Blashill, Superintendent Architect to the London County Council, and Mr. Seager Berry, appeared for that body; and several other solicitors for the relatives. The Coroner intimated that the London County Council had given him every assistance in the inquiry, and he had been able to appoint Mr. John Slater, a member of the Council of the Royal Institute of British Architects, to sit with him as Assessor.

Mr. Charles James C. Pawley said that he was

instructed two years ago by Mr. Rickard to act as his architect for the erection of the building. Witness prepared plans, which were submitted to the authorities. The original plans were now in Court, but the south block, which collapsed, was entirely replanned. The alteration affected the whole of the interior of the building. He believed the plans as altered, were submitted to the District Surveyor. The work was carried on under witness's supervision, and he visited the building on an average four times a week. Subject to the terms of the Building Act, he thought he might say he had a free hand. In November last her Majesty's Office of Works took a lease of the building, but the agreement did not affect the work of construction. On the day before the collapse he had been on the roof and noticed that about three-quarters of it had been concreted about three weeks, and that the remaining quarter had been quite recently done. Carpenters were fixing skylights, and considerable "jarring" was going on. One of the skylights was immediately over the part which fell. There was nothing wrong in the "jarring." He gave Mr. Simpson, his assistant, strict instructions not to allow the centering to be struck, having in his mind the possibility of an accident, as the concrete was not dry. There was a brick pier which was capable of sustaining a weight of 120 tons. As a fact it had to bear only 47 tons, carrying 14 ft. of each of the six floors. An iron stanchion, shown on the plans, had not been put in, nor had it been ordered. The effect of the omission was to throw a greater weight on to the pier, but in his opinion it had nothing to do with the accident. After the accident the piers had been demolished. He was convinced that the collapse occurred through the removal of the centering. He estimated that between 15 and 20 tons of concrete fell through the sixth floor. The impetus of 15 or 20 tons of concrete would be tremendous, as the seventh floor was not in to break the fall. The girders were of steel. He could not tell what bearing the girder had on the pier, but it should have been 9 in. Every girder was still in existence. He had asked Mr. Collins, District Surveyor, and Mr. E. Groom to make an examination. The steel girders were by Drew-Bear, Perks, Ramson & Co. and were ordered by Mr. Rickard, and he took his instructions from the drawings (produced).—The Coroner: Is there no means of testing your girders after they are fixed?—The Witness: No.—You noticed these girders after the collapse? What did you notice?—I saw they were bent. The witness added that he noticed that although the girders came from the brickwork, it was because the brickwork had been crushed by the weight pressing on the girders. The pier was 2 ft. 6 in. thick and 80 ft. high, but he believed it was a rule for architects that a pier must not be higher than twelve times its own thickness, so that really it should have only been 30 ft. high, but the reason of it being run up so high was because it appeared quite safe and well hemmed in, and was not what is known as an "independent" pier. The witness then gave details as to the fixing of the girders into the mortar, concrete, and brickwork. Asked whether he wished to add anything to what he had already said, the witness said the accident was caused through the concrete roof falling on to the sixth floor.

At this juncture Mr. Kent said the witness had been advised to obtain legal assistance, and counsel would be instructed for his re-examination. Under those circumstances he would ask the coroner to allow the re-examination to stand over.—The Coroner said his examination of the witness must not be regarded in the nature of cross-examination. He would be cross-examined by people having no hostile feeling towards him.

Mr. George Simpson, an architect and surveyor, stated that he was assistant to Mr. Pawley, the previous witness, and in conjunction with him superintended the building of Abbey-mansions. He gave the building more attention after November 17, the day on which the Office of Works took it over. He saw the men putting in the centering for the concrete roof, but he could not say he saw it commenced. The centering was supported by quartering secured with bolts, the whole resting on the lacing joists of the roof. He did not give directions as to the concrete to be used. The concreting of the roof was done in one continuous job, and he should say five or six days before the fall. Murrell's man put it in. Mr. Pawley gave the witness specific instructions not to allow the centering to be removed. He immediately told Murrell so. On the morning of the day of the accident he was on the roof, and saw two bricklayers pointing a chimney and some carpenters at work on a skylight. After the collapse Murrell said he had instructed his foreman not to strike the centering. No clerk of the works was engaged, and he did not consider it necessary, as he and Mr. Pawley were looking after the building. He knew that the centering had been struck, because it was lying on the adjoining roof.

Mr. William R. Rickard, City-road, a builder and contractor, said that about two years ago he entered into an agreement with the freeholder for the erection of these mansions, and he instructed Mr. Pawley to prepare plans and specifications. It was his own venture. It was in 1896 that he began the north block on the original plans, which were altered when he got up to the first floor. The south block was not, however, commenced on

the original plans. The sub-contract for the brickwork was placed with a Mr. Thorpe at so much per rod. He (witness) had no control over the brickwork. He had a sub-contractor for the flooring, and had no control over that. The same remark applied to the roof and the carpentering.—The Coroner: What part of the building had you any control over?—The Witness: The labourers' work.—Continuing, he said it was to his own interest to see that the work was done as contracted for.—Pressed by the coroner, the witness admitted that he had no money of his own in the undertaking; somebody else advanced the money. On November 17 last he sold his interest in the concern for 1,000l. profit. He sold it to the freeholder, Mrs. Leeds. He was to finish the building at prime cost. He estimated the building to cost 20,000l. up to the roof. There was no agreement as to the cost. He took out quantities, and thought he would get up to the roof for 20,000l.—It did not affect his pocket if the building stood or fell after November last. He believed the concrete was to consist of four parts of coke breeze and one part of best Portland cement. It was to be turned over once in a dry state, and twice while wet, but he did not know whether that was carried out.—By the Coroner: The way in which the concrete was mixed was very important.

The inquiry was then adjourned until Wednesday. The Coroner, at the opening of the proceedings, said he had been in further communication with the Home Secretary and the London County Council, and had arranged for the calling of expert evidence at a later stage of the inquiry. The witness would be Mr. Blashill.

Mr. Horace Avory, who now appeared for the first time, asked the Coroner to allow the further examination of Mr. Pawley, the architect, to stand over, in order that he might be fully instructed to watch his interests.

The Coroner, in assenting to this course being adopted, said he wished to mention that the Assessor had received certain anonymous letters making suggestions. That was a very improper course, and if any one had suggestions to make as to what happened or did not happen he should give in his name and he would be summoned to give evidence.

Richard Martin Collins, stonemason, said he was employed by Mr. Courtney, the contractor for the stonework. He commenced working on the South block in August last, when he noticed the condition of the building. The brickwork was let to Mr. Thorpe. Some of the bricks were soft, and a great many cartloads were brought from another job, for which they had been rejected. These were used for the internal walls of Abbey-mansions. Some of the bricks fell to pieces by mere handling, and were thrown into the mortar-mill. Mr. Thorpe only found the workmen. He could not swear that he saw any of the soft bricks used in the construction of the pier which supported the floor girders. The pier measured 3 ft. 6 in. by 18 in., not 3 ft. 6 in. by 2 ft. 6 in., as stated by the architects. He measured it himself. Witness never saw Mrs. Leeds, the freeholder. Mr. Andrews used to sign for her.—The Coroner said it was very curious, after his remarks at the previous sitting, that Mrs. Leeds was not legally represented. Witness went on to say that the stone templates supplied for the pier were not used for the pier at all. That would certainly affect the solidity of the building. He fully realised the serious nature of his evidence. The foreman bricklayer was responsible for the proper templates being used, but the men used to take the first templates that came to hand. When he protested against the small templates being used he was jeered at and told to mind his own business. The ordinary mortar was used. Men did not stay there very long. Mr. Thorpe was responsible for the fixing of the girders. The principal carriage girder went into a flue at both ends. He believed that a girder went right across the pier. The lacing girders were not bolted up to the carriage girders as they should have been. He never saw any holes drilled in the carriage girders for the bolts. He made no observation about it, as it was not his business. Mr. Thorpe said nothing to him about the drilling of the holes. He had a practical knowledge of cement, using it daily. As to the cement on this job, it was of the usual kind. He knew Mr. Rickard, the contractor, who never gave any directions. Mr. Pawley had given witness instructions. Mr. Pawley had often said, "I am the builder here." Hundreds of thousands of the soft bricks were inside the walls now. Skinner was foreman over the concrete flooring. The building was up three or four floors high before a girder was put in. The templates were put in and holes left for the girders by the bricklayers.

By Mr. Hudson: None of the girders below the roof in the South block had any holes in them. He had seen the outdoor manager of Banks' Fireproof Construction Syndicate on the building hundreds of times. To the Coroner: He had never heard an iron stanchion mentioned. The 9 in. wall from the end of which the stanchion would have gone, was not built in the basement while he was there. By Mr. Kent: He would swear that on April 2 the girders were not bolted.

William John Waller Beckey, outdoor manager of Banks' Fireproof Construction Syndicate, said they were instructed by Mr. Rickard to supply the fire-

proof floors. It was not correct to say that Parker was in the employ of witness's firm; he was one of Murrell's leading men for the construction of the roof. Witness saw every part of the building as it was erected, and in his belief, on the second and third floors the lacing girders were bolted. He had seen concrete being wrongly mixed for the roof, but he said nothing about it as it was not his business. Instead of turning it over twice while dry the men poured water on it at once. He saw it sent up to the roof. He did remark to Andrews, the general foreman, that the cement was being badly mixed, but Andrews made no reply. By Mr. Hudson: He could not be positive as to the bolting of the girders. He had only to concern himself about the lacing joists. At the time of the collapse the second, third, fourth, and fifth floors had been concreted, and they were doing the fourth and fifth floor landings. The centring for the sixth floor was in, and the seventh floor was clear.

James Andrews, Holloway-road, said he was a carpenter and joiner and general foreman of this job. He was employed by Mr. Rickard. He remembered alterations being made on the plans. The ground plan was altered several times. To the best of his belief they had got up to the first floor front and the second floor back before he got the templates. The brick pier overhanging the wall on which it was built. He had a conversation with Mr. Thorpe about the pier, which he thought should have been a little thicker than the specification gave, and it was decided to make it five bricks by two and a half bricks. That was after Mr. Pawley's attention had been drawn to the matter. He used his own discretion as to the way in which the templates were put in. They had a specification when the footings were put in, but it was afterwards taken away—he believed to the architect's office. He never saw the specification after putting the foundations in. Mr. Pawley told him to put in 4-in. templates, but he could not say that he was ever told to put three templates into the pier. He did not think the templates would weaken the pier. Except for joinery, he never used the specification after the footings, though he was aware it was intended to convey instructions. He considered, as general foreman, he had control over the many sub-contractors. He did not know who made the sub-contracts. All he could do in the event of anything going wrong was to reason and argue with the man. The Coroner: You had no control as foreman? Continuing, the witness said the ironwork and concreting for the roof were contracted for by Mr. Murrell. He remembered Mr. Beckey calling his attention to the way in which the concrete was being mixed, and witness reported the matter to Mr. Murrell's foreman, Parker, telling him that the concrete should be turned over at least once while dry.

The Coroner: The specification says "at least twice." All through this case it has been "Please, sir, it's not me, but the other fellow." Isn't it very important that the concrete should be properly mixed? Witness admitted it was so. At the moment of the accident he was in his office. Much to his surprise, he discovered that the centring had been struck and was packed up on the adjoining roof. The Coroner: The concrete roof had been up a fortnight. Why should you be surprised?—Well, that was all I could think of. I am against concrete roofs, as they are too heavy. All the floors came down, as well as the roof and the pier. In reply to further questions, witness said he heard that a barge-load of bricks came from another job, having been condemned there, to Abbey-mansions. There were about thirty-five thousand of them, and either Mr. Rickard, or Mr. Simpson, the assistant architect, told him to do the best he could with them. Many of them were broken and soft; the whole ones were used for the internal walls. The soft ones were put into the mortar-mill.—The Coroner said that with so many bricks in the mill there was room for very little sand. Coming to the girders, witness said he allowed for a 9-in. bearing, and the bearing on the pier was 14 in. or 15 in. During the luncheon adjournment he had seen bolts in at least three of the girders. By Mr. Thomson: He saw on the plans that a stanchion was to be erected, but he did not erect it because he was not ordered to do so. Then, again, at the same time, he saw the way. When he was told to go on with the ironwork he had no specification or details. Mr. Hudson said the girders were ordered by the witness on postcards. The Coroner said it was quite inexplicable, and perhaps Mr. Hudson would adduce further evidence on the subject.

The witness Andrews said the majority of the barge-load of bricks were broken and were put through the mill. Sand was used with the mortar—that that he was certain—but he did not know in what proportion. Brick rubbish was cheaper than sand. During the building, if they saw any room for improvement they would give effect to it. He would tell Mr. Pawley, the architect. By Mr. Gardiner: He had never been on a job of this magnitude before without a clerk of the works. There was such an official on Mr. Rickard's other job close by, but he could not say whether that would account for the barge-load of bricks being rejected.—The Coroner said the specification was inconsistent with Mr. Rickard building on his own account. Cross-examination continued: Had the pier been built on

ootings in the basement it would have been much stronger, and it would have been the ordinary way. With reference to the stanchion, no provision was made for it in the details, but it did appear in the original plan. The pier was never used for hoisting purposes. The inquiry was resumed on Thursday morning.

ALLEGED INFRINGEMENT OF ANCIENT LIGHTS IN WESTMINSTER.

The case of *Lawford v. the Army and Navy Stores, Limited*, came before Mr. Justice Romer, the Chancery Division on the 6th inst., in which Mr. McNaughton, Q.C. (with him Mr. Horne), on behalf of the plaintiff, moved for an injunction to restrain the defendants from building so as to interfere with the lights to certain windows in flats in Francis-street, Westminster, of which the plaintiff was the mortgagee for 500 years. Counsel said any interference with the property which would make it less valuable and less likely to let would be very serious to the plaintiff, as the property in question was leasehold.

Mr. Vernon Smith, Q.C. (with him Mr. F. W. Maugham), for the defendants, said he was willing, on behalf of the defendants, that the matter in dispute should be referred to an independent expert, and after some discussion his lordship directed that the matter should be referred to an independent expert to say whether or no there was any substantial damage to the plaintiff's windows, and if so whether he could suggest any and what modification.

Mr. McNaughton said that he had arranged with his learned friend on the other side that the names of three experts should be placed in a hat, and that the name of the one drawn out first should be the person to whom the matter should be referred.

IMPORTANT POINT UNDER THE LONDON BUILDING ACT, 1894.

The case of *Paynter v. Watson*, came before the Divisional Court of Queen's Bench composed of Justices Wills and Kennedy, on the 6th inst., by way of a special case stated by a Metropolitan Police Magistrate raising an undecided question under Section 43 of the London Building Act, 1894, as to the right of the owner of premises to rebuild them in a different manner to the old buildings without first obtaining the consent of the London County Council. The Section in question enacts "where any person intends to erect a domestic building . . . abutting upon a street on the site of domestic buildings existing at the commencement of this Act . . . (1) It shall be lawful for such person before commencing to erect the intended domestic building, to cause to be prepared plans showing the extent of the previously existing domestic building in its several parts . . . and to cause such plans to be submitted to the District Surveyor, who shall (if reasonably satisfied with the evidence of their accuracy) certify the same under his name and such certificate shall be taken into consideration by the Council in the exercise of their powers, such person may then erect the intended domestic building, provided that no more land shall be occupied by the newly-erected building than was occupied by the previously existing domestic building as so certified. If such person fail to submit such plans to the District Surveyor, or the Tribunal of Appeal refuse to certify the accuracy of the same, such person shall be bound by the preceding provision of this part of this Act."

"(2) If a person erecting the intended domestic building shall desire to deviate in any respect from the plan or plans certified by the District Surveyor, it shall be lawful for him to apply to the Council who shall sanction such deviation on such conditions as they may think fit." The material facts were as follows:—The appellant was Major George Paynter, of the District of St. George's, Hanover-square North. The case was stated, on an appeal to the magistrate, from a notice of objection served by the District Surveyor under Section 150 of the Act. The appellant had served a building notice under Section 143 of the District Surveyor, and had thereupon erected the plan and sections of the new buildings which he proposed to erect on the site of Nos. 12 and 14, Grafton-street. These plans showed that the new buildings would not cover any ground that was uncovered before, but the arrangement of the upper floors was such that a certain amount of the existing air space would be occupied by the new buildings, which were to be higher and to contain more cubic feet than the old. The magistrate found that the plans of the proposed new building deviated in certain respects, and particularly in regard to the height, from the plans of the old buildings, and he held that the word "deviate" in section (2) applied not only to the ground covered by the old buildings, but also to that part of the buildings which was to be higher and wider and to stand on several floors, and he therefore affirmed the Surveyor's objection.

Mr. Macmorran, Q.C. (with him Mr. Poyser), on behalf of the appellant said the magistrate was wrong, and submitted that the owner was within his rights so long as he covered no more or different ground with the new buildings than the old.

buildings covered. He did not contend that it was an unqualified right to rebuild. It is only intended to give the rebuilding dispensation on the requirements of Section 41 (2) as to amount of air space to be left for the benefit of the neighbourhood. The "plan" referred to in the section meant only a ground plan. He referred to Section 47, and said that that would apply. The object of the difficulty was that the appellant said he would build on the old area to any height subject to Section 47. The County Council, on the other hand, held that not only the ground area must be the same, but the cubic content.

Mr. Horace Avery (with him Mr. Daldy), for the respondent, pointed out that Part V. of the Act, in which part group of sections was to be found, as headed "Open spaces about buildings and height of buildings." By Section 41 all new buildings were to have air space from the ground upwards. Under the law before this it was enough to have air space from the ceiling of the ground floor. As under the old law the ground floor did not necessarily have air space, it followed that if a person re-erecting old premises chose to build up straight above the ground floor, no air space would be left at all.

Mr. Justice Wills, in giving judgment, said that he did not doubt the case. All depended on what was meant by "the plan showing the extent of the previous existing domestic building in its several parts" in section 41 (1). It would be the most extraordinary synonym for ground plans possible. If person chose to rebuild an old house exactly as it was, he might get the protection of this section. The original condition of the section was that no ground previously uncovered should be covered. But if a person desired to deviate in any respect, and that in respect only, then he was subject to the jurisdiction of the County Council. He thought that the Magistrate had come to a right conclusion, and that the appeal must be dismissed.

Mr. Justice Kennedy concurred.

STRANGE BUILDING DISPUTE AT EASTBOURNE.

A FARTHING DAMAGES AWARDED.

THE case of Baker v. Evershed was tried before Mr. Justice Kekewich in the Chancery Division on Tuesday and Wednesday. It was an action for a mandatory injunction to restrain defendants from permitting certain work to be done in front of the plaintiff's shop at Eastbourne, so as to overlap the plaintiff's premises. It appeared that the plaintiff was the owner in fee of No. 67, Terminus-road, Eastbourne, occupied by Mr. Newbury, the defendants being jewellers, and occupiers of the adjoining premises, No. 65, Terminus-road. The plaintiff's case was that in April, 1897, a hoarding was put up in front of the defendants' shop, and when it was taken down the plaintiff discovered that the side of the shop next to his property had plaster with a bracket on top of it which encroached on his premises. The party-wall between the two properties had, up to the alterations, been erected as held in common—that was to say, the defendants were entitled to half of it and the plaintiff to the other half. When the plaster and bracket were put up the plaintiff found they encroached to the extent of about 13 in. to 14 in. on his premises. The plaintiff alleged that 1 in. of overhang in Terminus-road was worth from 17s. to 20s. and that it was so important to him that he should have the action, as he was mediating the alteration of his shop front in the same way as Messrs. Evershed had altered theirs. When the defendants' alteration came to the plaintiff's knowledge, he at once complained; but as they declined to make any difference to the projection, the present action was brought. At the conclusion of the case, and after hearing evidence of a conflicting character, his lordship held that the defendants had committed a technical trespass, and awarded the plaintiff one farthing damages and no costs.

MEETINGS.

SATURDAY, MAY 14.

St. Paul's Ecological Society.—Visit to the Church of St. Paul, under the guidance of Mr. H. Roumeau Fergusson, and if the weather be favourable, to the Church of St. Andrew.

MONDAY, MAY 16.

The Royal Institute of British Architects.—Mr. T. G. Brown, R.A., on "The Libraries of the Middle Ages." 7 p.m.
Carpenters' Hall, London Wall (Free Lectures on Carpenters' and Joiners').—Professor Banister Fletcher on "The Art of Framing and Construction of Roofs." 7.30 p.m.
Society of Arts (Lecture Lectures).—Professor Carus on "Electric Traction." 11.15.—8 p.m.
Association of Electricians.—Mr. H. T. Eve on "Comparative Values of Cattle Foods—Chemist versus Valuer." 8 p.m.

Liverpool Architectural Society.—The Annual General Meeting of Directors and Officers and the Fifty-third Session (5) Closing Address by the President, Mr. W. Willink, M.A. 6 p.m.

WEDNESDAY, MAY 18.

Architectural Association Discussion Session.—Mr. W. Aldwinckle, Jun., on "Recent Sanitary By-Laws."

British Archaeological Association.—Mr. T. Canon Hughes, M.A., on "Gressingham Church, Lancashire." 8 p.m.

Society of Arts.—8 p.m.

Builders' Joint and Cloths of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Reinforcing Architectural Society.—Mr. A. Greig on "Church Decoration in Norfolk." 8 p.m.

THURSDAY, MAY 19.

Society for the Encouragement of the Fine Arts.—Dr. J. S. Phené, F.S.A., on "Pre-Roman Gold Work and Magnificent Pre-Roman Jewellery, Manufactured in the British Isles, in Pre-Historic Times." 8 p.m.

FRIDAY, MAY 20.

Architectural Association.—Mr. A. T. Walmisley on "Foundations as Applied to London Buildings and Riverside Foundations." 7.30 p.m.

SATURDAY, MAY 21.

Architectural Association.—Seventh Spring Visit, to Grove Hospital, Tooting. 7.30.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until June 20.

11897/3736.—JOINTS OF EARTHENWARE OR OTHER PIPES: J. Farley.—To close a butt joint a loose abutment ring or collar is slipped over the joint and has its inner face formed with an annular groove to communicate with an opening formed in the abutment ring; upon the inner face of the latter is arranged a strip or ring of canvas cemented by its edges to the inner face of the abutment ring on each side of the groove. The canvas strip may be also fastened to the abutment ring by wire rings sprung into place or forced on by screw threads upon the two parts of the meeting ends of the ring and a nut to force them apart.

8,864.—SHARPENING SAWS: R. Turnbull, sen. & R. Turnbull, jun.—For feeding the saw up to revolving discs are slipped on the spindle and screwed up by a nut to keep them true; on the stand a table is placed in front of the wheels, raised above or below their centre to give the level to the saw-teeth; for hand and tenon saws three or more alternate teeth can be sharpened at one time, washers being placed between the discs to regulate them to the pitch of the teeth.

9,566.—TREATMENT OF SEWER AIR AND SEWAGE MATTER DURING TRANSIT IN DRAINS: R. H. Reeves.—Two vessels are fitted in an air-shaft, man-hole, &c., of a sewage or foul water drain, one vessel contains lime, lime-water, permanganate of potash, or lime mixed with gas-tar, the other contains sulphuric acid, which a sensitive tap allows to drip into a saucer and so become associated with the water of the line from the other vessel issuing under pressure into the saucer; the vessels are placed on a shelf or rack, well up the man-hole shaft, and the overflow falls to a series of porous or other pots; the water supply under the ordinary service mains is from branches, one of which is connected with a deep siphon whose legs are joined up and provided with a sluice cap for clearing the end of sediment; another pipe ends in a nozzle so arranged that the jet impinges against curved plates or discs, and is broken up into fine spray that acts as a cloud, and commingles with the vapour thrown off from the chimney-body whilst agitated in the saucer and during the trickling down from the pots.

9,876.—CLEANING CHIMNEYS AND EXTINGUISHING FIRES THEREIN: W. S. Pratt.—A compound of sulphur, sulphate, charcoal, and salt to which may be added sulphate of copper, nitrate of soda, carbonate of soda, and sulphate of zinc (all in named proportions), is held in a container, the holder, ignited, and a nozzle is directed at a chimney or flue; it is claimed that the fumes will clear away all soot, immediately extinguish any chimney on fire, and obviate the necessity of sweeping.

10,459.—GALVANIC COINING OR COPPER ALLOYS WITH PATENT: A. Lissmann.—The patina is artificially formed by electrolysis; the electrolyte consists of a liquid containing carbonates or compounds giving off carbonic acid and sulphate of lime; for bodies already in use the water makes a good electrolyte, provided it contains a minute percentage of carbonic acid in the form of lime and magnesia, and only a very small quantity of nitric acid and sulphate of lime; for bodies already in use the cathode is placed as near as possible and the electrolyte is caused to slowly flow between the anode and cathode, or, for monuments, the cathode is placed at a suitable distance, the whole being surrounded by water-tight fabric, and the electrolyte is slowly supplied and constantly renewed.

7,541.—DISINFECTING OR PERFUMING THE AIR OF WATER-CLOSETS, &c.: J. A. Lippincott.—The apparatus comprises a container for the disinfectant liquid, an atomiser fitted thereto for spraying purposes, and an air-pump, which is worked through a flexible tube, fastened to the door, so that by one movement—either opening or closing of the door, air is passed through the atomiser, and sprays a quantity of the disinfectant or perfume into the air of the room.

14,257.—SAFETY CRANK FOR HOISTING CRANES: R. Wolff.—The crank is designed to allow the load to be lowered in two different ways, firstly by uncoupling the device by a short jerk on the crank, when the load will sink under a certain amount of friction, and, secondly, by following the sinking of the load by turning the crank back, which carries the driving wheel, a loose toothed disc (d), a disc (d), a pawl engaging the teeth of disc (d), and a pawl engaging the teeth of disc (d).

14,443.—JOINT OR STOPPER FOR SANITARY AND OTHER LIKE PIPES: W. S. Euden & F. H. W. Higgins.—The socket is lined with a bituminous composition (as in the Hasall & Stanfield joint) or groove or spool are cut there, in, and on the raised portions thus left a thread is formed; on the spigot end is cast or moulded a corresponding outer flange, similarly grooved, in metal, concrete, and stone; when the screwed projections may be cast in the sockets and on the spigots.

15,068.—DRAIN PIPES: A. A. Wincott.—To furnish means for directing a number of drains into a general manhole, the drains they may lead thereto at varying angles, the inventor places, at or near the entrance of the

drain into the manhole, a bend pipe whose forward end engages and discharges itself into a shaped socket in the manhole, its other end being connected to the drain in the usual manner; the bend pipe has a hole, covered by a cap, by which cleaning, &c., may be readily effected; the manhole bed is constructed of uniformly sized blocks having overlapping or rebating edges; some of the blocks are formed with outlet channels having upon their upper side the collars or sockets before-mentioned with which the bend pipe is connected.

26,544A.—A SPADE: The Rev. Dr. L. Cheekman.—The handle has a greater length, to save the labourer from stooping, and is fitted with a cross-piece (for the pressure of the foot) at a little distance above the blade; the blade, oval in shape, is pointed with a deep bevel and larger reach of but.

30,144.—FLOORING OF STRENGTHENED BETON OR CONCRETE: F. Henneke.—For floorings of beton strengthened with iron or like the slabs, forming the ceiling and floor, are moulded at the workshop, and have their cores projecting in such a way as to be bedded in the beton of the joists moulded on the spot.

11898/3,660.—DRYING WOOD AND OTHER SUBSTANCES: J. H. Shadrach.—Within the steam-jacked chamber is a series of open-ended or perforated pipes, through which the superheated steam is supplied, arranged near the lower part of the drying chamber immediately beneath a perforated floor or partition; above the pipes is a pair of rails, upon which a wagon for carrying the timber to be dried can be run into and out of the chamber.

5,595.—LANTERNS FOR STREETS AND OTHER EXPOSED SITUATIONS: J. H. Shadrach.—The lantern is constructed so that it may be readily put together and taken apart, the glasses being fixed without putty, &c. The lanterns are trapezoidal, those for the lanterns are put into place by insertion from within the lantern, which they are secured by catches in the angle-posts, whilst the glass is fixed in the door before the door is fixed on its hinges.

6,446.—WINDOW-SASHES AND FRAMES: J. A. Taylor & G. A. Brown.—The sashes work freely in the grooves of the frames in the ordinary way, but instead of cords, pulleys, and weights, the inventors use metal plates or discs secured at one end of each plate only, so that by tightening or loosening a regulating screw the necessary springy action is given to the plates, which thus press against the frame's inner surface.

5,787.—CHIMNEY TOP OR COWL: J. Markham.—To obviate down-draught the top or cowl is formed of (a) a chamber having openings that are provided with hoods, (b) deflector-plates, and (c) a cover. The deflector-plates are arranged vertically around the cover, which rests above the chamber on which are the hoods.

NEW APPLICATIONS.

For week ending April 30.

9,450, J. Morgan, Air Inlet for Sewer Ventilation.
9,434, P. Naef, Smelting Ovens, and Calcining Limestones, with Recovery of By-products. 9,470, A. S. Bower, Drilling Motor-cars, &c., by Sprocket Wheels and Chains.
9,426, E. Graham, Wood Panels, Woodwork Boards, and all kinds of Materials suitable for Building and Decorating Purposes. 9,485, Scotts & Wilson, Implement for applying Paint and the substance. 9,486, F. E. Herdman, "Starting-boxes" or Combined Reostats and Automatic Cut-outs for Electric Motors. 9,500, England & Bousfield, and 9,754, T. A. Weston, Spanners and Wrenches. 9,501, Jessie E. Turner, Packings, Joint Washers, &c., for Manhole, and other Joints. 9,510, Dufour Frères, 9,502, P. Pfeiderers, Water-waste Preventers, &c. 9,525-6, F. Crisp, Fenders, Kells, and Stays. 9,548, P. 9,569, T. S. Tschieret, Electric Arc Lamp. 9,555, Brown & Poulton, Moulding Machines. 9,561, Wharton & Preston, Chimney Pot. 9,562, D. Paterson, Adjustable Combs. 9,563, Walker & Hildred, Cranes and the like. 9,582, G. Jones, Combined Water Purifier and Filter. 9,601, J. S. MacCoy, Workmen's Time Recorders. 9,605-6, J. Fokchaner, Filters. 9,611, Kurtzig, Safety Device for Lifts. 9,624, E. Tyden, Water Filters, and for Accumulating and Cooling Filtered Water, and Scouring the Filter by Means of the Supply and Preventing Exhaustion of the Filter. 9,625, G. 9,632, Marchand & Perin, Converting Gypsum, &c., into Plaster of Paris. 9,635, Agnew & Flynn, Fire-nozzles. 9,639, R. J. Eke, Binders and Shutters. 9,641, J. W. Minto, Combining Cutting and Drilling Machine. 9,644, Jessie M. Wythes, Ash-pans. 9,660, D. W. Buchan, Air-tight Covers for the Cleaning or Inspection eyes of Soil-pipes, Drains, Traps, or Sewers. 9,661, F. Lohm, Breaking-up or Lifting Rocks, Builders, Stones, or Earth. 9,677, Veritys & Ebbutt, Swing Joints or Ceiling Connections for Carrying Suspended Electric Light Fittings. 9,684, C. Letstner, for using the rise and fall of the tides to Produce Mechanical Power. 9,686, A. Baxendale, Chimney Pots, Ventilators, and the like. 9,695, J. Morel, Artificial Marble and other Translucent Artificial Products and Processes employed in their Production. 9,697, James Graham, Marquis of Graham, a Clinometer. 9,712, O. J. Lodge, Telephones, Circuits, and Relays. 9,714, G. F. Emery, Portable Electric Batteries and Electric Lamps. 9,723, W. Andrews, Electric Current Switch-Gear. 9,730, F. Henkel, Manufacture of Solid but easily soluble Alkaline Silicate. 9,737, C. R. Hott, for taking Flexible Moulds from Plastic Clay Models and Designing Relief. 9,745, A. H. Penman, Supply of Gas to Buildings. 9,745, Holbrooks & Paice, Step Ladders. 9,767, D. Cameron and Others, Self-closing Valves for regulating the Discharge of Sewage into Tidal Waters. 9,779, J. E. Austin, Opening and Closing Hinged Sashes, Ventilators, and the like. 9,789, Hirst and Collins, Electroliers and Incandescence Electric Lamp Pendants. 9,790, Catter & Aynsley, "Bubbler" suitable for Baths and other places, and 9,800, means for Pivoting Doors. 9,820, A. Hawley, Windows. 9,829, J. Shields, Construction of Bridges, and the like. 9,834, Innes, Locks and Latches. 9,845, The Computing Scale Company, Price and Weight Scales. 9,852, J. Jarvis, Earthenware and Lead or other Metallic Lining for Earthenware Close-pans. 9,860, W. Henwood, 9,874, W. Bryant, Kilns or Furnaces. 9,877, J. G. Dixon, Electric Switches. 9,888, W. M. Barger, Thresholds and Weather Strips therefor. 9,893, F. Safe, for Clearing Tramway Lines. 9,895, D. Davy & Thomas-Davies, Raising and Lowering Air Pumps. 9,902, Farnhill & Leslie, Brushes, Brooms, Scrapers, or other Appliances for treating Surfaces. 9,929, Fusill & Featherby, for Tubing Artesian Wells. 9,931, Holden & Brooke, Plastic Compound for Decorating Walls, Ceilings, and other Surfaces in Relief. 9,944, Simplex, Automatic Window Sash Fasteners. 9,950, E. L. G. Curo, Electric Motors. 9,952, C. L. Loeber, Water-sprinkling Devices for Extinguishing Fires. 9,958, J. H. Grell, Door Hinge with Lubricating Mechanism. 9,972, R. S. Norman Drawing Boards, &c.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Asylum Buildings, West Bangor, N.B.	Edinburgh District Lunacy Board	.....	June 30
*Exhibition Buildings	Glasgow International Exhibition	900, 150, and 100 guineas.	Aug. 15

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Uetia, Kerbs, Macadam, &c.	Bredbury & Romiley	J. W. Bain, School Brow, Bredbury	May 17
Reconstruction of Bridge over Towy near Land 13	O. W. R. Co.	Engineer, North Station, Paddington	do.
Four Cottages near Cross Keys Station	do.	J. E. Hargrave Archt. 65, St. John's Street, W.	do.
Rebuilding of Athenaeum Buildings, East Street, Sunderland	do.	J. F. Smillie, Boro. Surv.	do.
Market Shed, Fish Quay, Low Lights, North Shields	Tyneworth Corp.	A. Broad, Archt. 22, George-st. Crofton	do.
Store and Workshop, Factory-lane	Croydon T.C.	The Engineer, Guildhall, E.C.	do.
*Underground Conduits	Corporation of London	H. Ball, Calford, S.E.	do.
*Kerbing, Channelling, &c. Hither Green-lane	Lewisham B. of W.	do.	do.
*Kerbing, Channelling, &c. Panmure-road	do.	do.	do.
*Pe Sowers	Watford U.D.C.	Office 14, High-street, Watford	May 18
*Lime, Cement, and Granite	Mile End Old Town Vestry	J. M. Knight, Vestry Hall, Ban-rot-road, Mile End	do.
Lime, Tubes, and Bricks	Leeds Corp.	B. H. Townley, Municipal Buildings, Leeds	do.
Cast Iron Pipes	Manchester Corp.	W. H. Tabbot, Town Hall, Lynton U.D.C.	do.
Grass and Manure	Lynton U.D.C.	Bowman Elcock, Stand-ington	do.
Cottages, Stoughton, Broughton Moor, Cumberland	W. M. Esop	W. S. Blaine, Archt. 31A, Clare-street, Bristol	May 19
Recreation Ground Works, Park Road, &c.	Jarrow Corp.	J. C. May, Town Hall, Brighton Corp.	May 20
Alterations, St. Peter's Hospital	Bristol Union	T. H. Walker, Eugr North-alton	do.
*Portland Cement	Brighton Corp.	C. Sharp, Archt. 59, Fen-church-street, E.C.	do.
Highway Improvements near Faculty Lodge	Stokeley R.D.C.	H. M. Bennett, Archt. 36, Corn-street, Bristol	May 21
Drill Hall and Gymnasium, Bantled, near Knap	Reynold Dist. Managers	J. E. Hargrave, Archt. 65, St. John's Street, W.	do.
Cottages, Stoughton, Broughton Moor, Cumberland	W. M. Esop	R. Little, C.E. 74, George-st. Edinburgh	do.
Two Shops, Moravian-road, Kings-wal of Bristol	London-derry Bridge Commissioners	E. J. Lovegrove, Office South-west-lane, High-gate, N.	May 23
Church, Moseley, nr. London-derry	Rev. P. Grant	City Engineer, City Hall, Dublin	do.
Terrace of Houses, Berwick	do.	City Engineer, Municipal Buildings, Dublin	do.
Waterworks, Pipes, &c. Laneside, nr. Berwick	do.	Elworthy & Son, Archts. London-rd. St. Leonard's	do.
*Sewering, Levelling, &c. and Pipe Sowers	Hurnsey U.D.C.	C. W. Bayley, Esq. Bank, Manchester	May 24
*Tree Gratings	do.	H. Walker, C.E. Angel-crow, Nottingham	do.
Electric Mains, &c.	Dublin Corp.	W. J. Downes, Surv. Council Office	do.
Ten Houses, Derwent-avenue, Holbeck, Leeds	Heating School Bd.	M. A. Hennessey, Archt. 4, South-wall, Cork	do.
Additional to School, Silverhill	do.	G. T. Hine, Archt. Parliament-street, West-minster, W.	do.
Engine Shed, Rhope, &c. Rose Grove, Leeds	Lancs. and Yorks. Ry. Co.	Borough Surveyor, Town Hall	do.
Cost-guard Buildings, Penman, Aber-denshire	Admiralty	The Engineer, Guildhall, E.C.	do.
Cast Iron and Stone-ware Pipe Sowers, Oadby, nr. Leicester	Staly R.D.C.	A. H. Tiltman, 6, John-street, Bedford-rd., W.C.	May 25
Sewerage Works	Kauford U.D.C.	do.	do.
Additional to Convent, Bandon, co. Cork	do.	do.	do.
Asylum Superstructure, Bamberstone	Leicester Honor Asylum Visitors	do.	do.
Brick Culvert, Wakefield-road	Huddersfield Corp.	do.	do.
*Repairing and Replating Walls, &c.	Corporation of London	do.	do.
*Deals and Battens	Eben Union	do.	do.
Fittings in Store, &c. at Hospital	Metropolitan Asylum Board	do.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Pipe Sower	Greenwich B. of W.	141, Greenwich-road, S.E.	May 26
*Janeway at Workhouses	Shoreditch Guardians	G. J. Smith, 17A, Great George-street, W.	do.
*Granite and Granite Clippings	Thames U.D.C.	J. Kirk & Sons, Archt. Huddersfield	do.
Surgery, C. each House, &c. Brunswick-street, Huddersfield	Commissioners H. M. Works	Postmaster, Guildford	do.
*Relating Post Office at Guildford	Newport (Mon) Union	B. Lawrence & Son, Dock-street, Newport	May 28
Workhouse Buildings, Stow Hill	Darwen Corp.	Borough Engineer, Municipal Buildings	do.
Electricity Supply Station	Newport (Mon) Union	G. W. Holmes, Town Hall, Walthamstow U.D.C.	May 29
*New Buildings and Alterations at Workhouse	Walthamstow U.D.C.	J. P. Kay, Archt. 44, Ter-dental-buildings, Leeds	do.
*Materials for Erection of Isolation Hospital	Walthamstow U.D.C.	W. Wyke, Ryedale, All-terrace, Felling	do.
Twelve Cottages, Coldwell-lane	Windy Nook Co.-op. Soc. Ltd.	W. Wyke, Ryedale, All-terrace, Felling	May 30
*Brick Depositing Tanks	Sandbach U.D.C.	W. R. Meering, Gas Works, New-street, Edinburgh	do.
*Removal of Channelling	Edinburgh and Leith Gas Co.	do.	do.
Cast Iron Pipes, &c.	Walton-on-Nare U.D.C.	H. W. Gladwell, Serv. Council Office, Mill-lane	May 31
Kerling, Channelling, &c. Station-rd.	Alverstoke (Hants) Union	H. F. A. Smith, Archt. Star-chamber, Gosport	June 1
Additional to Workhouse	Alverstoke (Hants) Union	W. G. Dootie, Archt. Dawson-chamber, Dublin	do.
Church, Clonakey, near Roscrea, Ireland	Rev. M. B. Curry	H. E. Jones, Harford-st. Slough	June 4
*Quadrant Tanks	Slough U.D.C.	R. E. Office, Mill-lane	June 11
*Making up Streets	Slough U.D.C.	W. G. Dootie, Archt. Dawson-chamber, Dublin	do.
*Paving and Whitewashing, Wool-holms, Pommers-street	Sheffield Sch. Bd.	H. E. Jones, Harford-st. Slough	do.
Additional to Schools, Garden-street	Mechborough Sch. Bd.	H. E. Jones, Harford-st. Slough	do.
Alterations, &c. to House Culture more Farm, O. only, Perthshire House, Maryborough	Sheriff M. L.	H. E. Jones, Harford-st. Slough	do.
H. use, Culture, N.B.	Rev. A. W. Williams	H. E. Jones, Harford-st. Slough	do.
Sutton Buildings, Hopton	Warral Ry. Co.	H. E. Jones, Harford-st. Slough	do.
New Roads, Kirby Marlow	do.	H. E. Jones, Harford-st. Slough	do.
Additional to Methodist Chapel, New-bell	do.	H. E. Jones, Harford-st. Slough	do.
Villas, Hasland, near Chesterfield	do.	H. E. Jones, Harford-st. Slough	do.
Wesleyan Chapel, Holbeach Marsh, Lincs.	do.	H. E. Jones, Harford-st. Slough	do.
Rebuilding Wellington Hotel, Wilson-street, Middlesbrough	Hass & Co.	H. E. Jones, Harford-st. Slough	do.
Drill Hall, Berwick	do.	H. E. Jones, Harford-st. Slough	do.
Seven Houses and Shops, Kicksall-road	B. Greaves	H. E. Jones, Harford-st. Slough	do.
Alterations, Blue Bell Hotel, Glas-houset, Leeds	F. A. Cliff	H. E. Jones, Harford-st. Slough	do.
Warehouse, Green-street, Leeds	Hambridge & Co. Ltd.	H. E. Jones, Harford-st. Slough	do.
Shoe Factory, Kirkal-rod, Leeds	do.	H. E. Jones, Harford-st. Slough	do.
Houses and Shops, King-street, Cork	D. J. O'Brien, & Co. Ltd.	H. E. Jones, Harford-st. Slough	do.
Houses, Orton, Berwickshire	do.	H. E. Jones, Harford-st. Slough	do.
Fourteen Cottages and Five Houses, Hunslet, Leeds	do.	H. E. Jones, Harford-st. Slough	do.
Shop and Premises, High-street, King's Lynn	Mrs. Gates	H. E. Jones, Harford-st. Slough	do.
*Warehouse	J. Cohen & Co.	H. E. Jones, Harford-st. Slough	do.
*Superstructure of Buildings at Asylum	Leicester Borough Asylum	H. E. Jones, Harford-st. Slough	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applica-tion to be in.
*Deputy City Surveyor	Carlisle Corp.	150, rising to 200	May 25
*Surveyor	Bexley U.D.C.	200, per annum	May 26

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, vii, & viii. Public Appointments, pp. xvi, & xvii.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.	
April 26.—By DILLEY & SON (at Thrapston).	
Old Weston, Hants.—"The Lodge Farm," 428 a. 1 r. 37 p. 4 f.	£4,500
April 27.—By F. Doo & Co. (at Ilford).	
Ilford.—Netley-rd., &c., 25 plots of building land, f.	450
By Messrs. SPELMAN (at Norwich).	
Norwich.—St. Giles-st., "Cavendish House," f. r. 25.	1,310
By Messrs. & PLACE (at Nottingham).	
Nottingham.—Abbotsford-st., "The Adelphi Hotel," u.t. 32 yrs, g.r. 125 5s.	
Denman-st., "The Sir Garner Wolsley Hotel," u.t. 70 yrs, g.r. 205 10s. 6d.	
St. Peter's Gate, "The Eight Bells Inn," f. Angel-crow.	29,000
Beck-st., "The Beehive" p.h., with houses and shops adjoining, u.t. 8 yrs, r. 230s.	
Sussex-st., "The Harrington Arms," b.h., u.t. 2 yrs, r. 205.	
20, Hunger Hill-rd., with off-licence attached, u.t. 8 yrs, r. 45s.	
By GLOVER & HOMEWOOD (at Gravesend).	
Gravesend, Kent.—King-st., the site of St. Thomas Almshouses, area 14,400 ft. f.	10,100
By THOMAS MARTIN (at Frome).	
Frome, Somerset.—"The Critchill and Gibbet Hill Estate," area 242 a. 3 f.	2,375

Frome, &c., Somerset.—"The Clink Estate," area 62 a. f.	£3,300
By PHILIP DAVIES (at Llanbadarn-fynydd).	
Llanbadarn, Radnor.—"The Garn Farm," 102 a. 0 c. 6 p. f.	900
"The Yron Farm," 198 a. 2 r. 27 p. f.	2,550
"Esgairwyndwn Farm," 51 a. 3 r. 38 p. f.	2,970
Llanbister, Radnor.—Great and Little Moeleir Farms, 135 a. 3 r. 11 p. f.	500
April 28.—By DYER, SON, & HILTON.	
Lee.—13, Belmont Pk., u.t. 54 yrs, g.r. 14d.	350
Lewisham.—15, Walerand-rd., u.t. 37 yrs, g.r. 10s. f. 55d.	1,100
Pimlico.—Lower Belgrave-rd., &c., 14 gr. 14 yrs, g.r. 36d.	1,700
Greenwich, Kent.—Charles-st., f.g.r. 32l. rus. reversion 17 yrs.	500
Stoke Newington.—19 and 25, Midway Pk. f. u.t. 120l.	1,200
Tottenham.—29, 30, 32, and 34, Henry-rd., u.t. 70 yrs, g.r. 12s. f.	450
Barnsbury.—81, Richmond-rd., u.t. 52 yrs, g.r. 4l. f. 55d.	615
Canonbury.—36, Halton-rd., and The Sussex Stable, u.t. 20 yrs, g.r. 44l. f. 50s.	340
By FAREBROTHER, ELIN, & Co.	
Holborn.—19, Red Lion-st., f. r. 90l.	2,900
Clapton.—112 and 114, Lower Clapton-rd., f. r. 105l.	1,610
Hendon.—Sunning-rd., u.t. 44l. f. 50s. and r. a. o. r. 36 p. f. f. 80s.	2,500
Wood Green.—88 and 92, Lordship-lane, f. e.r. 80l.	£1,000
Hemel Hempstead, Herts.—"Hill House," also a Cottage and r. r. 18 p. f.	700
Llandogo, Mon.—"Pentwyn," and 20 p. f. e.r. 25l.	350
By C. C. & T. MOORE.	
Tottenham.—69 to 87 (odd), Philip-lane; also f.g.r. 22l. 10s. u.t. 53 yrs, g.r. 50l.	2,550
Clapton.—45, Median-rd., u.t. 67 yrs, g.r. 74l. r. 25l.	290
Commercial-rd. East.—34, 37 to 43, 46, 47 and 48, Gower's-walk; and 3, 4 and 5, Webb's-pl., u.t. 11 yrs, g.r. 57d.	420
26 to 54 (even), and 49 and 51, Burdett-st., u.t. 12 yrs, r. 175l. r. 400l.	300
Hackney-rd.—78 to 108 (even), 73 to 79 (odd), Brunswick-st., and 51 to 69 (odd), Great Cam-bridge-st., u.t. 20 1/2 yrs, g.r. 40s.	2,100
1 Mile End.—108 and 110, Canal-rd., u.t. 69 yrs, g.r. 74l. 10s.	510
46 and 48, Bridge-st., u.t. 15 yrs, g.r. 54l.	35
Bechal Green.—6, Church-rd., u.t. 12 yrs, g.r. 175l. r. 400l.	35
Poplar.—46, Pennyfields, f. r. 25l.	32
37 and 38, Wade-st., f. r. 40l. 8s.	47
Shadwell.—214, High-st., r. 40l.; also f.g.r. 24l. u.t. 13 yrs, f. r. 130l.	48
1 Limehouse.—4, Beccles-st., f. r. 25l.	30
By J. A. & W. THARP.	
Leyton.—27, 29, and 31, Etchingam-rd., u.t. 82 yrs, g.r. 115 5s.	48
Stratford.—14 to 30 (even), Manby-rd., u.t. 82 yrs, g.r. 14l.	55

LONDON.—For five houses, Barking-road, East Ham, for Mr. C. R. Banks Martin, architect, 123, Fleet-street, Grosvenor-
Ham—
J. W. Sullivan.....£2,777
C. Lawrence.....£2,441
For two houses, B. Banks Martin, architect, 123, Fleet-street, Grosvenor-
Ham—
H. Jackson.....2,968
A. Manning.....2,950
J. G. Herdick.....2,475
C. Tasson.....2,151
Accepted.

LONDON.—For five houses, Beekton-road, Canning Town, for Mr. H. Drake, Mr. C. Banks Martin, architect, 123, Fleet-street, Grosvenor-
Ham—
W. J. Madison.....£1,950
C. Lawrence.....£1,660
J. G. Herdick.....1,775
C. Manning (accepted) ..1,445

LONDON.—For various decorative and sanitary works, 23 and 48, Nevins-square, South Kensington, South Kensington.
Messrs. Manley & Lettis, surveyors, 185, Earl's Court-road, S.W.:—
Mr. F. Perton and Sons.....£274
James Whitaker.....292
F. Holdstock.....381

LONDON.—For decorative repairs and sanitation, 4 Nevins-square, Earl's Court, South Kensington. Messrs. Manley & Lettis, surveyors, 185, Earl's Court-road, S.W.:—
Mr. F. Perton and Sons.....£274
F. Holdstock.....138
Whitaker, Jpn. Earl's Court-road (accepted).....£2,335

LONDON.—For adding alterations and decorative repairs to No. 31, Westbourne-grove, W., for Mr. Stuart S. Samst, Jr., architect, 123, Fleet-street, Grosvenor-Ham:
Manifold & Son.....£189
J. O'Callow & Wright.....£357
A. V. Piddison.....291
Accepted subject to arrangement.

LONDON.—For fireproof flooring and staircase, Jasper House, Earl's Court-road, South Kensington, in accordance with requirements of the Local Board of Health, Messrs. Morley & Lettis, surveyors, 185, Earl's Court-road, S.W.:—
Lole & Lignfont, Chelsea.....£795

LONDON.—For sundry decorations, hot-water fittings, and electric-light installations, 63, Earl's Court-road, S.W., Messrs. Manley & Lettis, surveyors, 185, Earl's Court-road—
Mr. F. Perton and Sons.....£274
F. Holdstock.....318
J. Whitaker, Earl's Court-road.....£295
Accepted.

LONDON.—For constructing the foundations of the Head Office of the City of London Corporation, at the Strand, near the Bank, for Mr. E. D. Hall, architect, 57, Moorgate-street, E.C.:—
Cliff, Ford & Co.....£6,971
Spencer, Santo, & Co.....£2,993
J. J. Wallington.....2,871
Smith & Dickson.....479
John Shillabe & Son.....5,800
Henry Horvat.....£2,981
Lawrence & Son.....5,229
Leslie & Co. (accepted).....4,386

LONDON.—For the erection of printing, premises, Cross Keys-yard, for Mr. F. M. Matheson, Messrs. Barnes, Williams, Ford, & Griffin, architects:—
Edwin T. Hall, architect, 57, Moorgate-street, E.C.:—
Cliff, Ford & Co.....£6,971
Spencer, Santo, & Co.....£2,993
J. J. Wallington.....2,871
Smith & Dickson.....479
John Shillabe & Son.....5,800
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J. J. Wallington.....2,871
Smith & Dickson.....479
John Shillabe & Son.....5,800
Henry Horvat.....£2,981
Lawrence & Son.....5,229
Leslie & Co. (accepted).....4,386

LONDON.—For addition to premises, City-road, for Messrs. Betts & Co., Ltd., Messrs. Barnes, Williams, Ford, & Griffin, architects:—
Edwin T. Hall, architect, 57, Moorgate-street, E.C.:—
Cliff, Ford & Co.....£6,971
Spencer, Santo, & Co.....£2,993
J. J. Wallington.....2,871
Smith & Dickson.....479
John Shillabe & Son.....5,800
Henry Horvat.....£2,981
Lawrence & Son.....5,229
Leslie & Co. (accepted).....4,386

LONDON.—For alterations, &c., at No. 11, Harrington-road, South Kensington, S.W., for Mr. Henry Bullington, Mr. Edward Morrison, architect, Acton-vale, W., and 22, Buckingham-street, W.:—
G. Lyford.....£1,930
Oldrey & Sons, Kilburn, N.W. (accepted).....£945
Godkin & Sons.....1,678

LONDON.—For alterations, additions, and fittings at the "Carlisle Tavern" public-house, Mooty-road, Bow, E., for Mr. George W. Fred. A. Ashworth, 177, Romford-road, Stratford, E.:—
Alston, Fittings, Total.
R. E. Williams & Sons.....£2,595
H. Wall & Co.....1,455
T. H. Cooke (accepted).....2,973
T. H. Cooke (accepted).....2,973

LOWESTOFT.—For supplying and fixing heating apparatus and boiler, &c., at the technical schools, for the Corporation, Mr. Resner & Russell.....£395
J. W. Brooke & Co., Ltd., Lowestoft (accepted).....£395

MITCHAM.—For pulling down and rebuilding the Buck's Head, Mitcham, for Hoares Brewery Company, Messrs. Perry & Read, architects, John-street, Adelphi, Strand. Quantities supplied—
Hilf, Bedall & Co.....£2,412
Simpson & Co.....£3,185
Perry & Co.....8,771
Knight & Co.....7,933

RAMS-GATE.—For the erection of twelve almshouses, &c., The Almshouse, St. George's, for the Vicar and Churchwardens of St. George's parish (the trustees under the will of the late Mrs. Barber), Messrs. W. G. Osborne and Langham & Co., joint architects, Rams-gate. Quantities by the architects:—
R. Stock.....£5,195
W. W. Martin.....£4,822
E. T. May.....5,003
J. H. Forsyth, Rams-gate.....3,855
E. Paget.....9,084

ROTHWELL HAIGH.—Accepted for pulling down and rebuilding the "old Half-way House Hotel" premises, together with the site, for the Halfway House Brewery Co., Limited, Leeds. Mr. Thomas Winn, architect, Leeds:—
Archibald & Macdonald, Binks Bros., Ltd., Colindale, near Wakefield.....£2,420
C. G. Alston, Leeds.....1,200
St. Columba-street, Leeds.....£1,200
Phishing and Glazing.....£1,200
Chapel Lane, Leeds.....£1,200
Dunbar, A.S. S. Wheathe, Calverley, near Leeds.....£1,200
Painting.....£1,200
Snowden & Sons, Ossett.....£1,200
Slater-Jas. Senan, Hunslet, Leeds.....£1,200
Ironfoundry (Newcastle & Hamilton, Dewsbury)

ROTHWELL (Northampton).—For sewerage, paving, &c., Evison-road, for the Rothwell Waterworks Co., Mr. T. Feason, surveyor, Messrs. Maude House, Rothwell:—
J. Buckley.....£330
W. C. Willmott, Rothwell, N.B. (accepted).....£370
A. Balson.....£370
Accepted.

SOUTH-ON-SEA.—Accepted for the erection of twelve semi-detached villas for Mr. T. H. Batstone, Mr. H. I. Stevenson, architect and surveyor, 16, Craven-street, Strand, &c., £5,798

ULVERSTON.—For the construction of sewers, sewage-tank, &c., for the Ulverston Rural District Council. Mr. J. Greenwood, Surveyor, Union Office, Ulverston.
T. & W. Dixon, Lonsdale-road, Kendal, Westmorland £599 10

WEDNESFIELD.—For the execution of sewerage works, &c., or the Urban District Council. Mr. R. E. Warrington, engineer, 1, 2, and 3, Bank-buildings, Lichfield-street, Wolverhampton.
Jas. Mackay £9,417 Jas. Owens £8,900
Currell, Lewis, & Martin 8,904 Ford & Hudson 6,198
Geo. Law 8,500 H. Holloway, Welverhampton 5,920
J. Biggs 7,390
H. Weldon 6,144
[Engineer's estimate, £6,000.]

WOLDINGHAM.—For the erection of cottage residence. Messrs Barnes-Williams, Ford, & Co., architects.
Bates, Sons, & Holness £865 A. B. Chirgwin 777
J. L. Miller 820 T. E. Dives 785
Accepted.

LONDON SCHOOL BOARD TENDERS.
At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders:—

HALFORD ROAD.—Erecting manual training centre.—
McCormick & Sons £299 R. A. Tolbury & Sons 830
J. Garrett & Son 880 E. Triggs 825
H. Knight & Son 824

"MICHAEL FARADAY."—Adapting No. 37, Thulow-street, for a schoolkeeper's residence.—
Johnson & Co. £298 J. F. Ford £140 0
Frankton & Co. 195 E. B. Ford 140 0
Rice & Son 185 H. Line 140 0
T. Hooper & Son 177 E. Marsland 126 0
H. J. Williams 160 0

NICHOL STREET.—Re-building the boys' offices, and two offices for girls; extending and refitting the infants' offices in playground; reconstructing the infants' and girls' offices on roof playgrounds; erecting covered playground for boys; enlarging the schoolkeepers' house; providing drainage scheme and enclosing, draining, and tar-paving additional land.—
Samuel Mason, Ltd £4,099 9 3 Lathey Bros. £4,379 0 0
Johnson & Co. 4,002 0 0 Grover & Son 4,347 0 0
G. S. Williams & Son 4,000 0 0 W. Akers & Co. 4,271 0 0
R. A. Yerbury & Sons 4,688 0 0 E. Lawrence & Sons 4,217 0 0
G. Parker 4,430 0 0 E. Triggs 4,119 0 0
G. Parker 4,430 0 0

"PARAGON."—New school—boys, 350; girls, 320; infants, 400. Total, 1,112, with schoolkeeper's house, cookery, laundry, and manual training centres.—
Perry & Co. £50,776 J. & M. Patrick £26,896
F. & H. F. Higgs 29,464 R. A. Yerbury & Sons 26,445
Kirk & Randall 28,228 Lathey Bros. 26,152
B. E. Nightingale 28,883 Treasure & Son 25,258
J. Carmichael 26,774 S. Hart 24,749
J. Grover & Son 26,535 Simpson & Co. 24,162
E. Lawrence & Sons 26,445
* Recommended for acceptance.

PAINTING THE EXTERIORS OF THE FOLLOWING SCHOOLS.—

ALBION STREET.—
Johnson & Co. £167 Rice & Son £98
H. Lamb 178 E. Triggs 98
A. White & Co. 115 Marchant & Hirst 97
G. Brittain 127 E. Proctor 60

CHARING CROSS ROAD.—
W. Whitley £68 W. Hornett £75 0
W. Brown 68 B. E. Nightingale 71 0
Lathey Bros. 66 W. Chappell 59 10
F. G. Minter 90 E. B. Tucker 53 0
T. Nicholson 90 1

FINSBURY ("Whitlington").—
McCormick & Sons £138 Stevens Bros. £114
Gardner & Hazell 134

"MOBERLY" (late Harrow-road).—
G. H. Sealey £255 E. T. Chinchon £125 0 0
F. Childley 140 18 W. Whitley 79 0 0
C. Gilling 142 15 Bristow & Edgewell 73 4 0
Marchant & Hirst 124 0

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Thomas & Edge £163 0 0 C. S. Jones £140 0 0
C. Foreman 155 0 0 C. G. Jones 90 0 0
W. Banks 119 18 E. Proctor 70 0 0

PULTENEY.—
W. Hornett £175 Lilly & Lilly, Ltd. £145
W. Brown 197 R. G. Minter 120
Lathey Bros. 158 W. Chappell 125
E. B. Tucker 156 B. E. Nightingale 115
T. Nicholson 148

REDDINS ROAD.—
Jones & Groves £237 10 G. Kemp £185 0 0
Sear & Son 250 0 F. Britton 154 0 0
Frankton & Co. 215 0 Rice & Son 150 37 0
I. Garrett & Son 208 0 W. Akers & Co. 147 0 0
J. F. Ford 177 0

RUSHMORE ROAD.—
P. Britton £231 0 McCormick & Sons £242 0
Unfried 299 0 Steven Bros. 214 10
G. Wales 259 17 S. H. Corfield 211 0
W. Suk & Son 245 0 G. Barker 2 4 0

THOMAS STREET.—
Johnson & Co. £210 A. White & Co. £157 0
J. F. Holiday 275 0 D. Gibb & Co. 149 0
A. W. Derby 180 0 S. H. Corfield 125 0
J. T. Roney 155 15

WENLOCK ROAD.—
Chase & Son £210 W. H. Wagstaff & Sons £243 0
J. Morison 208 0 F. Britton 238 0
J. Kybett 238 0 J. Grover & Son 231 10
E. Lawrence & Sons 245 0

WILMOT STREET.—
J. T. Roney £271 J. Kybett £214
P. Britton 205 D. Gibb & Co. 262
A. E. Symes 225 Collis Wilmot 276
* Accepted.

TO CORRESPONDENTS.

S. W. (Amounts should have been stated).
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The Builder.

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MAY 21, 1895.

ILLUSTRATIONS.

Tower of St. Mark's Church, Harrogate.—Mr. J. Oldrid Scott, F.S.A., F.R.I.B.A., Architect.....Double-Page Photo-Litho.
Shooting Lodge, Miesfeld, Kirckcubrightshire.—Mr. J. K. Hunter, Architect.....Double-Page Photo-Litho.
"Broomhill," Oxshott, Surrey.—Mr. F. G. Knight, F.R.I.B.A., Architect.....Double-Page Photo-Litho.
Sketches in the Neighbourhood of Caen.—By Mr. J. H. Coram.....Double-Page Ink-Photo.

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Working-Men's Insurance.*

THE Workmen's Compensation Act, which comes into operation on July 1, has attracted, both during the time when last year it was passing through the Legislature, and the present intermediate period before it comes into effect, great attention to the subject of working-men's insurance. But it must be confessed that most people have considered this question chiefly from a business point of view. That is to say, masters have regarded it from the point of view of those who will largely have to pay compensation; workmen as those who will receive money; insurance companies as those who will have to make money by indemnifying capitalists. We are apt, too, to look at the subject in too contracted a manner, not to allow our gaze to have a sufficiently wide range. If we endeavour to take a bird's-eye of the subject throughout the world, we shall be astonished at the immense importance of it. It is one of the vastest and most striking of modern movements—it affects the happiness and the well-being of millions of men.

It is now possible to take such a view with the assistance of the work, which has been just opportunely published, and the title of which is placed at the foot of this article.* This is one of an American series—the Library of Economics and Politics—and it is written with that clearness and power of grasping facts and of generalisation which is so conspicuous and admirable a feature of the legal literature of the United States.

It is very desirable that the subject should be regarded from the practical and historical point of view, for too often it is discussed with no little prejudice. For example, we are told that compulsory insurance and the intervention of the State is Socialism pure and simple; and in Europe at least the very uttering of this word terrifies many persons. But "the modern movement for insurance represents the effort to substitute for the old

relief fund institutions founded upon scientific principles, whereby each working man provides by regular payment for the relief he will probably need. The significance of this difference can be seen in the use of the word insurance instead of relief." Let us look at this a little more in detail. A working man who, either by accident, sickness, or age, is prevented from earning money, and has saved none, without a proper system of workmen's insurance has three courses open—he may starve, he may beg for charitable relief, he may go to the workhouse. As regards the latter, what is its basis? Pure Socialism. Those who have property have to pay poor rates, from which paupers are supported in their old age, either by means of what we call outdoor relief or in the workhouses, which ought, by the way, to be termed poor-houses. If, however, the State by means of compulsory insurance obliges workmen and capitalists to put money into a particular fund, to which also the State contributes, it is obvious that this is not a bit more Socialism than the worse system of doles, or relief in a workhouse in old age, or in time of sickness. We desire to emphasise this point because we are convinced that there is an irresistible tendency throughout the world to a system of compulsory State working men's insurance.

It is obvious from this book that the subject is quite in an embryonic stage in the United States. This is natural; it is in old countries where there is less opportunity of making money for all comers that working men's insurance is most needful. Each country differs according to its age, its character, and many other circumstances. Thus, the scientific character of the German mind has had practical results, for it is in that country that the system of working men's insurance has been developed in the most complete and perfect manner. "To-day there is in practical operation a complete and harmonious system for the triple insurance of practically all working men of the Empire against accidents, sickness, old age, and invalidity." The rise of this system was based on three distinct circumstances—"the development of a political philosophy which accorded to the State the widest attributes for the purpose of improving social conditions; that of the rapid rise of a social democracy, which, impatient at the feeble improvement accom-

plished under the existing organisation of society, avowedly sought a complete destruction of the existing social fabric, in order to introduce a new regime; and that of the beneficial results already accomplished through partly voluntary and partly compulsory insurance societies." In fact, Germany was a field fitted pre-eminently for such a system, just as the strength of individuality and voluntary effort in Great Britain will cause difficulties for a long time to arise before such a system can be established in this country. That it will come into being sooner or later we cannot doubt; but in every phase of life, in England, it is almost a truism to say that everything is established in an irregular and almost a contradictory manner. Our constitution, our laws, and our social system have been created in a manner which, to the scientist, is positively horrifying. On the other hand, to the English mind there is something curious in the fact that it is to the works of philosophical writers such as Fichte and Sismondi that we must go for the first causes of the system of working men's insurance in Germany. What, however, in a word, is the present state of affairs in that country? Working men's insurance is the creation as an actual system of Bismarck, whose political object was, so to say, to take the wind out of the sails of the Socialists. In 1883 the Bill for compulsory insurance against sickness was passed; in 1884 that in respect of accidents. Five years later, in 1889, the Bill for Insurance against old age and invalidity became law. The subject is so large that it would be wholly impossible in this article to go into detail, but as showing the elaborate character of this system we may refer to the point of compensation for accidents. The amount is fixed "after a proper investigation by the organs of that trade association in whose jurisdiction the accident happens. Against this decision an appeal may be made at an arbitration court composed of two members of the trade association, two representatives of the injured workman and a presiding magistrate. In more complicated cases an appeal from its verdict may be made to the Imperial Insurance Department" (p. 62.)

Let us turn next, for another brief glimpse of the subject, to France, where the struggle between the principles of obligatory and

* "Working-men's Insurance." By William Franklin Wolloughby, United States Department of Labour. New York: Thomas J. Crowell & Co.

voluntary insurance is being thoroughly fought out in the Legislative Chambers and the Press. In a word, there is no obligatory, or strictly speaking, State system of insurance—there are a great number of institutions, much faulty in system. Among these there are three State institutions—the Caisse Nationale des Retraites pour la Vieillesse, established 1850, for the provision of old age pensions, and a similar institution in case of death, and another in case of accidents. But these were established in 1868. "These, though State institutions, are purely voluntary in operation." So that they may be said to resemble in some sense our own Post Office Savings Banks, where a working man may put by a fund of his own to meet either sickness or accident. Of these institutions the first is the most important: Collective insurance, that is contributions both by workman and employer are allowed, and it would appear that it is chiefly to this system of collective insurance that the marked success of this bank is attributable.

Of course, both in regard to the different systems of France and Germany there are any number of interesting points—all bearing on the future of the great subject which we might well consider. Our object, however, has been rather to note the difference in the basis of the systems in force in the two countries. If we try to work at our own country, side by side with Germany and France, it would seem that we have advanced further than France, but not so far as Germany. We have a very complete system of mutual societies—friendly societies, as we call them—under Government supervision. That is to say, we have voluntary societies watched by the State. Then, in the Compensation Act of 1897, we have the liability of employers for accidents to workmen made so general, and we have mutual societies so recognised, as to have, in an indirect manner, made insurance compulsory. For the present, it is not likely that the system in regard to accidents will be placed more under the influence of the State, though those workmen who are now outside the Act of last year will in no long time be certainly admitted to its benefits. The question which is obviously the most important, which is pressing for solution, is that of provision for old age. That is to say, the country is rapidly becoming ripe for some system whereby the State shall step in at an early period in a working man's life, and not merely relieve him in a decrepid old age. The present system is unsatisfactory. It does not assist a workman towards helping himself. Its tendency, on the contrary, is to cause him to spend his earnings during health and strength, and then to throw himself on the State in his old age. It is obvious that the example of Germany is, therefore, of the greatest importance to this country, and nowhere will the system in force in that country be better learned than in the work on which this article has commented.

THE PARIS SALONS.

IN spite of the fact that the two Salons, Old and New, are now both accommodated in one building, so vast is the space covered by the Galerie des Machines that there is no diminution whatever in the extent of the two exhibitions. The "Old Salon" occupies two-thirds of the building, the eastern

portion, the New Salon the remainder, the two being divided by a neutral zone in the shape of an open space devoted mostly to luncheon tables, though a portion of it on the south side is appropriated to small objects of art, statuettes, &c.; and here the territory of the two Salons is divided by an architecturally-treated partition wall finished off gracefully with a columnar order and an acroterion at each end. The whole arrangement of the building and the design of the temporary partitions has been, we believe, in the hands of an eminent French architect, M. Loviot, and is highly creditable to his taste and discernment.

Neither Salon presents evidence of any special movement in French art since last year. As before, the Old Salon represents the more popular side of the art of painting—a vast heterogeneous collection of pictures illustrating all sorts of subjects, a considerable proportion of which are drawn from modern life, while the New Salon consists rather of pictures illustrating special effects or special theories of artistic treatment. Accordingly, the latter is usually spoken of as the more interesting exhibition by artists, and no doubt there are a great many commonplace and (in an artistic sense) vulgar works to be found in the Old Salon; but it must be remembered that the number of works is very much greater, and if the best were selected from them there are enough among them to make quite as artistic a collection as that of the New Salon, and perhaps a superior one in general power and interest.

The only special feature that one can notice as characteristic of the Old Salon of the present year is the rather curious one, considering the rationalistic temper of the French mind generally at present, of the presence of a larger proportion than usual of paintings of religious and biblical subjects, many of them on a very large scale. Some of these, including two or three of the largest, are decorative wall pictures for churches, painted in a flat fresco-like style; others are easel pictures in the usual pictorial style. From an artistic point of view none of them are of the highest class, if we except M. Hippolyte Flandrin's picture of the Vocation of St. John and the return from Calvary, painted for the chapel of Saint-Jean des Sulpiciens, a fine work both in decorative effect and in feeling; the left hand compartment, intended to illustrate the passage, "From that time that disciple took her into his house"—the return of St. John to his own house with the mother of Christ, is singularly beautiful in the dignity and pathos of the two figures. Most of the other decorative paintings for churches, though well composed and drawn, are cold and destitute of interest.

Apart from these ecclesiastic works, however, decorative painting on a large scale, the form of art which directly connects painting with architecture, is well illustrated in the Old Salon: one whole room is filled with M. Cormon's paintings and studies for the decoration of the new Natural History Museum, which form a very remarkable collection. The ceiling, which is completed, represents the leading races of mankind; the primitive man in the foreground; on the left, in the next plane of the picture, the Aryan race under the guidance of Greece; on the right, balancing them, the Semitic races; in the background the types of coloured peoples. The studies for wall panels portray the historic development of life on the earth,

commencing with] the animals of early geologic time, then portraying the developments of the human race from the primitive man through various epochs; many of these latter designs are [at present only in sketch form. This, when completed, will be a most remarkable example of the illustrative use of decorative painting in a public building. How one wishes that one could see the Government of this country, or the London County Council, engaging eminent artists to carry out such a scheme as this in a public building. The decoration of St. Paul's is the only thing of the kind on a large scale that has been done, and that with no assistance from public funds. The next most important in size of the decorative paintings is M. Rochegrosse's great picture for the staircase of the library at the new Sorbonne, "The Song of the Muses awaking the Human Soul." This is in a somewhat more academic style, more so in fact than one would have expected from this painter; still, there is a certain grandeur about it. The Muses, in a closely compact group, float onwards in the air through the middle of the picture, past a foreground on which various figures typical of uncultured mankind appeared to be aroused and attracted by their song; a savage looks up from a hand-to-hand fight as if half inclined to let his victim escape; in the centre of the picture the typical woman of the cultivated ages is in the act of starting up as if called into being. The colouring, like the design, is somewhat academic; but the whole thing has an effect, and will look well in its place. Then there is M. Raphael Collin's very pretty design for the small Salon of the new Opera-Comique, "The Harmonies of Nature inspiring the Composer," which in fact they do not do, but one may accept the idea as an excuse for a picture. M. Collin gives us what may be called a decorative woodland scene—woodland scenery treated in a very subdued conventional manner, with the composer standing in an open lawn in the foreground, while the "Harmonies of Nature" are represented by two figures floating past. M. Gervais has also given himself this year to decorative painting, not for a wall but for a ceiling, in which, according to the usual French programme, nude figures float about amid clouds in an aimless manner; one or two of the figures are very fine specimens both of drawing and colouring; but this is, to English eyes, an unsatisfactory employment of the powers of a gifted painter. The French notion of a ceiling painting is always pretty much the same; clouds and a blue sky, and people reclining on the clouds or flying up into the sky; and, too often, balustrades or columns painted in upward perspective as if standing vertically above the ceiling. This taste in ceilings seems to have sunk into the French mind and to be ineradicable; we see specimens of it every year; M. Marioton, who is an old hand in this work, has his ceiling as usual, this time under the title "Les Songes" (they are all pretty much alike, although the names differ); but then M. Marioton's talents are just about suited for this kind of work, while M. Gervais is worth something better.

To see the best of the other decorative paintings of the year we must cross over into the New Salon, where the prince of decorative artists, M. Puvis de Chavannes, has his realm, and exhibits this year a large upright panel intended for the Panthéon, representing

Genevieve watching over the sleeping child standing on the roof of a building, caps the Panthéon itself (formerly the church of Ste. Genevieve), the composition being filled up by the parapet, the wall of the tower, and the view of the city below, is indicated than clearly shown. Comparing this with some of M. de Chavannes' classic subjects in decoration (several of which have been illustrated in the *Builder*), this is a disappointing work; the lines are rigid and angular, including that of the figure of the saint herself, who is apparently purposely designed with this stiffness and vertical line to harmonise with the general design, but it does not make her an interesting figure. The figure is surrounded by a very prettily designed decorative border. In the New Salon also is a large and in its way important piece of decorative work for the wall of the theatre of zoology at the Sorbonne; it is of inferior intellectual interest to the already mentioned, being a kind of vision of the sea with a number of marine growths painted on it, as if seen through water; hardly a picture, but an effective and suitable method of decorating a wall in a manner symbolic of the use of the apartment in which the work is carried out. M. Fourié exhibits also a decorative picture painted by permission from the State, for a situation in the Hôtel of the Ministry of Agriculture; however it is hardly a decorative picture in the usual sense, being a landscape in perspective, occupied by figures engaged in various occupations, a fine strong peasant girl in the foreground, and a ploughing group immediately behind. This is painted in a somewhat flat and dry kind of execution, to all the look of an easel picture, but as far as design goes it is an easel picture. Two other decorative landscapes are exhibited, ideas very alien to English habits of artistic perception, and they are not at all successful; but one, by M. Mondot, which takes for its keynote a line from Virgil, our old Latin Grammar friend—*"fortunatus nimium sua si bona nôrnt"*—

is really fine, and succeeds in being decorative in character without reducing landscape to a flat plane. It represents Virgil in the foreground looking after a group of peasantry going down the steep road, a large tree shading over the foreground and filling a deal of the picture; the decorative effect is realised by treating the landscape in broad spaces of colour with little detail, and no attention paid to line; thus it is rescued from the category of *picture* landscapes, and assumes a kind of conventional suitability for a wall-painting. It is a kind of attempt seldom made in England, perhaps rather a risky one, but in this instance the result is a success. It is intended for the "Hôtel des Agriculteurs de France," and is, we presume, another government commission.

Among historical pictures in the old Salon the most important is M. J. P. Laurens's "The Arrest of Broussel," a large life-size picture of a set of soldiers coming down the steps of a public building, the prisoner headed, walking with them. This has the dignity of style and dramatic effect which always characterise M. Laurens's paintings of this class. Otherwise, historical painting is rather at a discount; the most worthy work, next to the one just

mentioned, which might be grouped as historical, is M. Tony Robert-Fleury's "Sous la Terreur — une perquisition." This is a very original work; not a scene crowded with figures, as one might expect; it is the passage in the interior of a house, where one terrified lady leans against the door of a closed room listening to what is happening; a treatment that is more suggestive than many more elaborate paintings of scenes in the Revolution have been. Amid the mass of pictures of all kinds (more than two thousand in number) collected in the Old Salon, it is only possible to name a few of those which are especially effective and should on no account be missed. Among these is the "Hercules" by another member of the Laurens family, M. Pierre Laurens; a picture noteworthy because it contains a new idea. It represents what was really the true Greek idea of Hercules, as the busy indefatigable worker for mankind, tramping along in a great hurry through the twilight landscape, with a stormy sunset behind, to be in time for his next piece of business; not a great brawny man, but a large solidly-built youth with a refined Greek face, and a formidable club over his shoulder. The picture is heavy in colour, but it is a really fine conception which gives us a new idea of a great legendary personage. Coming from legend to modern life and realism, one of the finest things in the whole exhibition is Mme. Demont-Breton's "Dans l'eau bleue," a life-size painting of a young girl, a child, waist-deep in the sea and struggling to wade through the waves, her face flushed with her exertions and with the cold of the sea-water. As a representation of a moment of actual life and incident this is absolutely perfect; there is no sentiment and no story in it, but it is the real thing, it is like looking through a window at the sea and the figure. In this power of depicting movement, action, and character in a simple incident Mme. Demont-Breton is one of the greatest of living painters, and she has done nothing more complete in its way than this. In a very different way, and almost equally good of its kind, is M. Ridet's "Pensées d'Automne," two young ladies reclining on a bank in an autumn landscape, painted in very delicate tones and with much originality in colour treatment; the picture is realistic in a sense; the figures are clad in orthodox Paris dresses, but all the details are kept subordinate and refined away, so that nothing strikes the eye crudely or interferes with the sentiment of the scene and the melancholy expressed in the face of the beautiful young woman whose gaze is fixed on the distant landscape. This is a work quite above the ordinary level of paintings from subjects of real life. The two very small interior paintings by M. Lecomte, "Consolation" and "Femme épluchant des légumes," should be looked at as remarkable examples of miniature cabinet pictures full of small detail, but without the least touch of hardness, and very effective in the management of the lighting; they are both lamplight interiors. M. Debat-Ponsan has painted a vigorous allegorical picture of Truth ready to leap from the coping of her well, while two figures, an ecclesiastic (apparently) and a masked bravo, are trying to drag her back again; their realistic costumes contrast oddly with the nude figure of Truth, but the spirit of the work saves it. Two small pictures by M. Fantin-Latour,

"Andromeda" and "Le Lever," painted in the characteristic broad style of handling which is entirely his own, are of the highest artistic quality, the latter especially, which really recalls Rembrandt in composition and effect, though different enough in handling. M. Leydet's "Avant le Messe," a study of the expressions and characters of a row of peasant women, life size, waiting at the church, is a fine and serious work. Among the nude studies—those which may be called simply studies of the figure in various lights, there are fewer commonplaces than usual, and some very fine works; among them, in the Old Salon, Mr. N. A. Laurens's "Sous la Vague," two women on the margin of the sea waiting for a wave to break over them, whose figures are admirably drawn. In the New Salon are some charming small pictures under different names, by M. Stewart, a French-American artist, all with the same *motif*—the figure seen under broken light through trees, and all not only good in execution but more or less poetic in feeling. M. Houyoux, life-size picture, "Baigneuses," is a capital broad piece of painting of the figure in open-air light.

In the New Salon is one of the most remarkable pictures of the year—M. Dagnan-Bouveret's Supper at Emmaus. The subject is treated in a peculiar and semi-mystic manner; the figure of Christ, facing the spectator, sheds a soft golden light over the background; the disciples, at each side, look up with adoration; but the peculiar feature is the introduction at one side of a small group of people in modern dress, father, mother and child, looking on at the scene. This incident, a common kind of feature in Renaissance painting but very strange at first sight in modern art, of course puts the whole thing on quite a different plane; it is not so much a representation of the scene as a vision at which we look on, in common with the spectators represented at the side; and this incident certainly adds very much to the interest of the whole work. Another work of considerable interest is M. Friant's "Douleur," in which the artist has endeavoured to make a picture of the unpromising subject of a set of very commonplace but good old ladies in deep mourning by the side of an open grave, two of them endeavouring to support and console the chief mourner, who is nearly succumbing under her feelings. The group is life-size, and in spite of the difficulty of the mass of black dresses and the totally commonplace character of the faces, there is a real and natural pathos in the figure of the poor old lady bowed over the grave which makes its mark, and justifies the choice of the subject. In the New Gallery also is one of the most important of the pictures purchased by the State. M. Cotta's "Aux Pays de la Mer," a triptych picture in which the centre represents a farewell supper before the fishing crews put out to sea, while the smaller side compartments represent on one side "Ceux qui s'en vont," and on the other side "Ceux qui restent," the wives and daughters, namely, on the dark sea shore looking out into the night. This is a fine and pathetic picture made out of an event of real life. It is noticeable that, for the present at least, the pictures purchased by the State from the annual exhibitions are nearly all pictures with a moral, as one may say, or pictures of actual life among the poorer classes; another that has been purchased this year (from the Old Salon) is one

representing the old superstition, still in vogue on the coast and in fishing towns, of offering up a votive ship in the church, either as a thanksgiving for escape from shipwreck, or as a charm against that danger. It again strikes one as curious that a Government so very anti-religious as the French Government is at present, should nevertheless in its purchases appear to encourage popular superstitions of this kind; and should generally appear to consider the moral of a picture rather than its purely artistic quality. In purchasing pictures for presentation to popular institutions the Government may perhaps be wise in following this order of choice, but it strikes one as singularly in contrast with the known feelings and opinions of the educated classes in France at the present time.

Portraiture is not very strongly represented this year. M. Benjamin-Constant has two admirable portraits of the realistic order, one of M. Hanotaux of the Académie Française, the other of a French gentleman standing in the middle of his ancestral park; the latter a work that rather reminds one of Millais. There are a good many good portraits, but not many others that can well be called remarkable ones, if we except M. Humbert's portrait of M. Jules Lemaitre at his writing-table, a work of remarkable vivacity; and M. Aimé Moret's large equestrian portrait of "Prince d'A—," the artistic value of which is chiefly in the painting of the horse. In landscape there are many fine works, although there is a current talk, in which we cannot concur, that landscape is poor this year. A finer work than M. Harpignies' "Le Teverone," with its grand calm and its beautifully considered distance tones, it would be difficult to find. M. Didier-Pouget has a large and striking work "Le Matin—Vallée de la Creuse," in which a very powerfully lighted foreground, the slope of a hill in strong light, throws off into the distance a wooded valley half seen through a mist of hazy morning sunlight. There are a good many other fine landscapes, the larger ones being mostly in the Old Salon (except the decorative landscapes before mentioned); the New Salon contains a good many very interesting small landscapes, among which those of M. Cazin are pre-eminent as examples of style and breadth in the treatment of landscape; no one should visit the exhibition without looking at these.

Among the scanty sculpture exhibits of the New Salon one work, the plaster model of the so-called statue of Balzac by M. Rodin, to which reference has already been made in our columns, is exciting more public attention than any other work in the Salon. M. Rodin appears to have had the idea of representing the great novelist in a long cloak or dressing gown, a good enough idea in itself, seeing that Balzac's figure was not of sculptural appearance or proportions; but what he has sent in is a rough sketch or impression of a face at the top of a shapeless block of plaster, in which not even the slightest indication of a modelling of drapery has been made. As a sculptor's first rough sketch it might be taken as the promise of a remarkable and original work; as a work for public exhibition it is ridiculous. Nevertheless, the admirers of M. Rodin assert that it is a great work as it stands, and are organising a committee to collect 30,000 francs for its purchase in the hope of setting it up

in some public place in Paris, which it is not the least probable they will obtain permission to do. A rich "Industriel," who is an admirer of the paintings of Manet, has also offered to purchase the work as it stands from the sculptor. In short, both the sculptor and his friends seem to have gone a little out of their minds on the subject. The sculpture in the Old Salon is as large and, on the whole, as fine a collection as usual. The enormous quadriga and groups of horses and riders, by Mr. Mac-Monnies, the American sculptor, is the prominent object; this is to be set up at the entrance of Prospect Park, Brooklyn; but, though there is a certain grandeur about it, it seems rather a revival of a worn-out classical conception, somewhat out of place in modern days. It is a disappointment to find that M. Mercié exhibits only two small works, a bust and a statuette, and that M. Falguière, instead of one of the fine ideal nude statues in which he is supreme, sends only a great plaster model of an archbishop in tumultuous robes, which is neither interesting nor sculptural. M. Peynot's monument to Cardinal Bernadou, on the other hand, where the Cardinal is represented kneeling on the top of a great sarcophagus pedestal, with the robes very finely treated, is a powerful and impressive thing; and M. Soules exhibits a very beautiful group, a monument to a child, comprising the dead figure of the child, the mother kneeling on one side and an armed angel on the other side. Monumental subjects are rather predominant this year; two or three sculptors have imitated M. Mercié's rather favourite device of a mourning figure in bas-relief, relieved against an upright slab bearing the medallion portrait of the deceased in the upper corner; M. Desvernès' work of this type is very beautiful, but he owes the idea to Mercié. M. Puech's large monument to Francis Garnier, consisting of a bust on the top of a large circular stele, around which are grouped three colossal female figures whose feet fly out into the air on all sides, is no doubt spirited and original, but wants repose and concentration of line. M. Gauquié has achieved a really fine and graceful monument in which architectural form and detail is combined with sculpture; it is a lofty erection in Louis Quinze style, compounded of architectural scroll work combined with Cupids and garlands and other usual properties, but designed with a very fine eye to line and proportion, and supporting at the top the head and bust of a lady; "Monument Clairon, pour Condé-sur-Escaut" is the title. Among the works of purely ideal sculpture is a perfectly modelled figure in grey veined marble, by M. Boucher, representing the "Philosophy of History," writing on an upright slab towards which her face is turned; a beautiful work both in modelling and in the fine expression of the head. M. Gustave Michel's "Dans le Rêve" is a large marble figure of a half-draped woman of singular beauty of form, though not with the intellectual interest of M. Boucher's work. M. Moncel has produced an expressive group of a young man and woman under the title "Vers l'Amour," belonging to the sentimental order of sculpture, and which has been purchased by the Corporation of Paris. Among other fine works of ideal sculpture are M. Cornu's figure entitled "Douces Langueurs," M. Charpentier's "Doulleur," a female figure crouched against

and half under a rock; M. Eugène Marioton's "La Force protégeant Le Droit," a vigorous work in which the principal figure has something of the masculine power of Donatello's St. George; and M. Leclaire's "Le Premier Amour," a group of great passion and tenderness of expression. But there are many other works of great interest; studies of various aspects of human life and expression, some very fine pieces of animal sculpture, and a number of interesting and charming fancies, not belonging to the first order of sculpture, but all with their own individual interest. One of the great sources of interest, indeed, in French sculpture, is the amount of thought which is put into it; and in this respect the sculpture collection of the present year is not behind most of those which we remember.

NOTES.

The Sewage Commission.

The appointment of a Royal Commission to inquire into the disposal of sewage will doubtless result in an interesting Report. It will make glad also the hearts of a large number of people with various "fads" on this question, who will have an opportunity of presenting their views on this body. Of its practical utility we have some doubt. At present the trouble is not so much ignorance of the best modes of disposing of sewage as the fact that a large number of local bodies and individuals will not take those measures for its disposal which are clearly known to be desirable. The elections for Urban District Councils are constantly fought upon the question as to whether or not there shall be a sewage scheme, the opponents of which are usually victorious until at length, by the pressure of disease or of the Local Government Board, some scheme becomes inevitable. We do not doubt also that the appointment of the Commission will be used as a reason for delay by many local bodies who prefer not to spend money on sanitary work if it can be helped. They will say, with some show of reason, that if they spend their money before the Report is issued, the latter may result in some recommendations which will affect their scheme. We trust that the Local Government Board, however, will not allow this excuse to be of any avail.

The Geological Museum.

The proposal to remove the Geological Museum of Geology from Jermyn-street to South Kensington should be stoutly resisted. It is not only a museum, but the headquarters of the Geological Survey of Great Britain. It is in this place that those who require information as to the character of the ground in any part of England can always get it, not gratuitously, but of a kind which is as near as possible up to date and impartial. Miners, owners, engineers, owners of property, and many others constantly come to this office for information. Does a Local Authority intend to make a reservoir, the place where they go for information and advice as to the nature of the ground is the Geological Museum. The mania for sending everything to South Kensington is absurd. The Museum of Geology is admirably placed: it is central and accessible; but if the Museum has not sufficient space in Jermyn-street then a new site should be found in Westminster. Its officials are doing useful and unobtrusive work. It would be sheer foolishness

for the Government to remove it to Kensington, and we trust that a reasonable and successful stand will be made against its removal to that place.

WE have scanned with some curiosity the first number of the *Berliner Architekturwelt*, a new monthly periodical dealing with architecture, painting, sculpture, and art-craftsmanship (but chiefly, apparently, with architecture), published by Ernst Wasmuth, a well-known architectural bookseller of Markgrafenstrasse, Berlin. The publication is in quarto form, and the number to which we have referred has thirty-two pages of mixed letters and illustrations well printed on highly-illustrated paper. The illustrations are mostly photographs and washed drawings, and a few plans to a very small scale. But it arouses our curiosity is that, unlike the other German architectural periodicals, this venture deals solely with what we are accustomed to call architecture in this country, and with decoration; and entirely ignores the work of the engineer. The editors say they propose to look at things from a "purely artistic point of view," and one must suppose they know, or have had reason to think, they will find adequate support among German architects, the question arises whether that unfortunate breach between architecture and engineering—between the fine art of building and the science on which it ought to rest, which long took place in this country, is now beginning in Germany. Hitherto architects and engineers in Germany have been trained together, and in their subsequent careers have hardly been distinguishable, except as specialists in particular branches of a united profession; and, though the success of the scheme from an æsthetic point of view has always seemed perfect, there can be no doubt whatever that it is sound in principle that the artist, whether he be architect, painter, sculptor, musician, or whatever he should be, and thoroughly master of his materials, and of the best ways of using them. It is unfortunate for the architect that this is so difficult in his case, but that is no relief to him of the obligation, and he should see with regret that the severing of the study of architecture from that of the other forms of construction had extended Germany.

WE welcome the first instalment of the *Jahreshefte* of the Austrian Archaeological Institute, which has just appeared. The *Jahreshefte* takes the place, on a much more ample scale, of the old *Mittheilungen* which was, for the most part, concerned with local or Austrian archaeology. The new periodical will also be the official organ of the new Austrian Institute at Athens. It is edited by Professor Benndorf. The aims and objects of the new Institute, as defined in the official programme, are as follows:—1. To undertake archaeological expeditions and excavations. 2. To publish the scientific results of the same. 3. To undertake the supervision and direction of independent collections of antiquities. 4. To superintend the work of all archaeological students in receipt of State subsidies. Perhaps the most important article in the first issue of the *Jahreshefte* is that by Dr. Reich on the

Athene Hephaistion, i.e., the image of Athene which Pausanias (I. 14. 6) describes as standing near the god Hephaistos in their conjoint temple beyond the Kerameikos. Dr. Reich holds, with Dr. Dörpfeld, that this temple was unquestionably the actual temple commonly known as the "Theseion." By the help of inscriptions referring to the making of the statue, he believes that he can detect in several replicas the pose and motive of the original group.

AN important work is to be undertaken at Spalato. This will be the erection of a Central Museum, in which the collections at present scattered among four buildings will be brought together: including the objects found at Salona and in the palace of Diocletian, and the Museum Library of six thousand volumes. The authorities stipulate, however, that the town of Spalato should purchase the site selected for 20,000 florins, adding that, should the town refuse to do so, the entire museum will be transferred to Salona, where a site has been offered for nothing. A lively interest is taken in the matter in the town, whose citizens are anxious to preserve the museum within their own walls. The most satisfactory solution, as it appears to the Council of Spalato, seems to be to call on the citizens to raise money for the building of a church. Diocletian's Temple of Diana, which at present does duty as the cathedral, would thus be set free and be put, as a ready-made building, at the disposal of the Museum authorities.

THE raising of the pressure of supply from 100 to 200 volts by many supply companies has made their engineers demand very accurate meters. As the current taken by the lamps at the higher pressure is only the half of what it was at the lower, continual testing of the meters, especially for starting current, is rendered necessary. Mr. Gibbings, the engineer to the Bradford Corporation, in a paper recently read before the Institution of Electrical Engineers, mentioned that of the 461 meters ordered in 1897, 219 failed to pass his tests and had to be sent back to the makers. The accuracy of an electric meter has to be greater than that of a gas meter, but as the mechanism of the former is as a rule more complicated, it is more easily upset in practice. In one type of electric meter the effect of an overload due to a temporary short circuit is to make it read high permanently, whilst in another type the opposite effect is produced. The current at which the meter will start also generally increases the longer the meter has been in use. Hence the meters demand continual attention, and are a source of worry and constant expense to the supply companies. Mr. Gibbings has apparently solved his difficulties by inventing a meter of his own which is very simple in theory and has the merits of cheapness, simplicity of calibration, and the fact that it will register any current, however small. He uses what is practically a water voltmeter, and the number of units consumed is shown by the diminution in the height of the acidulated water in it, the rest of the water having been converted into oxygen and hydrogen. He has made a thoroughly good meter, the only point on which we have doubt is as to its

durability. The life of glass voltmeters in physical laboratories is notoriously short.

MESSRS. Dibdin & Thudichum recently communicated a paper upon this subject to the Society of Chemical Industry.

After referring to a former paper dealing with the bacterial treatment of the sewage effluent at the Northern Outfall Works at Barking Creek, the authors give the results of the bacterial treatment of a purely domestic, but very strong sewage at Sutton, of a sewage containing much "iron pickle liquor" at Leeds and West Bromwich, and of sewage containing organic refuse of an obnoxious character from leather-dressing works at Yeovil. The authors conclude with the important statement that "so far as our experience has gone, such sewages can be efficiently purified by the bacterial method equally with the domestic sewage from a purely residential neighbourhood." An interesting discussion followed the reading of the paper, and General Sir H. Prendergast mentioned that Yeovil sewage was known to be one of the foulest in the world, and that although the results of its bacterial treatment had varied at first, owing to the imperfect construction of the filters, it was now hoped that the process would prove successful.

The Grecian Theatre and Shepherdess-walk.

THE Charity Commissioners have made a scheme in respect of the "Bishopsgate Foundation" charity, for granting building leases of "The Eagle" tavern, the site of the Grecian Theatre, six almshouses, and the houses numbered 16-48 (even), in Shepherdess-walk. Nos. 1-25 (odd), Nile-street, and some other adjacent property, at annual rents amounting to 3,500*l.*, the lessee agreeing to expend in building a sum to yield a rack rental of 17,500*l.* per annum. "The Eagle" tavern stands on the site of "The Shepherd and Shepherdess" tea-house and gardens, a popular resort in the closing years of last century; the adjoining theatre was built by Thomas Rouse, in 1841, and was reconstructed and enlarged in 1858 by Benjamin Conquest. In 1876-7 a larger house was erected, the site of the dancing-hall being included, for his son, George Conquest, by John Garrud, of Spitalfields, contractor, from Mr. J. T. Robinson's plans and designs, with a stage, including the scene-dock, 60 ft. deep, a gallery with 1,500 seats, and a total capacity for more than 4,000 persons. On November 3, 1877, we published a plan and a view of the new premises, opened on October 29 of that year. In May, 1882, the lease of the tavern, the pleasure grounds, and the theatre, expiring in the course of the current year, and held at a rent of 365*l.*, was offered for sale by auction, but withdrawn after a bid of 18,000*l.*, the reserve price being 21,000*l.*

IN pursuance of an order made by Mr. Justice Kekewich, in the High Court of Justice, Chancery Division, the Crown leases of this property will be offered for sale next week. The house, formerly occupied by Admiral the Earl of Dundonald, was built in 1825, in the classical style, from, we believe, the designs of Burton, architect of the adjacent "St. Dunstan's Villa" and "Grove House." The grounds, being 5 acres in area, lie

between the Regent's Canal and the Outer-circle, and extend northwards for a considerable distance from near Hanover-gate to the foot-bridge, across the canal, beyond "St. Dunstan's." The canal was projected by Nash, in conjunction with his scheme for laying out this portion of the old Marylebone-park after the expiration, in 1811, of the lease to the Duke of Portland, to connect the Grand Junction Canal at Paddington with the Thames at Limehouse. The Regent's Canal was made in 1812-20, by James Morgan, engineer, who had been Nash's clerk, and laid out the Marylebone Farm and Fields after Nash's plans. Nash was at that time architect and surveyor to the Woods and Forests; the new works were begun in 1812, nineteen years having elapsed since, in July, 1793, the Treasury had instructed Fordyce, Surveyor-General, to offer a premium of 1,000*l.* for the best plan of laying-out the estate. Nash's proposal included lines of terraces, the circuit being completed by the canal in a cutting, and various detached villas, with a reserved central space for a royal palace; it was eventually preferred to a scheme propounded by Leverton & Chawner, architects and surveyors to the Inland Revenue Board, which provided for buildings of a more urban description.

An "Old London" Collection.

DURING this week has been dispersed at Sotheby's the first part of a notable collection of drawings, prints, engraved portraits, &c., gathered by the late Mr. J. Holbert Wilson, of Onslow-square, to illustrate the architectural, historical, and social history of London. Whilst not equal, in point of intrinsic value and importance, to Mr. Gardner's, which contains much that will not be found elsewhere, it includes many water-colour drawings by G. and T. Hosmer, Shepherd, C. Tomkins, Finlay, R. Godfrey, J. Buckler, and others, of lesser known and now demolished places whose names, rather than their aspect, are familiar to students of the town's topography. J. H. Shepherd's views of the "Red Lion" in West-street (formerly Chick-lane), the purlieus of the Fleet Ditch, the galleried inns, and "Slaughter's" in St. Martin's-lane, with Archbishop Tenison's Library (by Wren), Turner's birthplace, No. 26, Maiden-lane, and the Lord Mayor's banquet-house (Stratford-place) are very interesting. We may mention also the views of the old Pantheon, in Oxford-street, St. Martin's Round-House, Smithfield, Whitehall, Old Brompton, the tea-gardens, and the old theatres, schools, and prisons. Three of perhaps the rarest views are that of the interior of the Red Bull Theatre, Clerkenwell, engraved from Kirkman's Drolls, that of Bagnigge Wells, by J. R. Smith, after J. Sanders, and Toms's south prospect of Pancras Wells, showing the gardens south of the old parish church, where Stukeley laid his Roman camp. Some of Shepherd's drawings are replicas of those he did for Frederick Crace, whose collection was sold for (we understand) 3,000*l.* by his son, the late J. G. Crace, to the Government, in December, 1879.

Exhibition of International Art.

THE exhibition opened at the Knightsbridge Skating Club hardly bears out this high sounding title, since it consists of a collection mainly of works of the "irreconcilable"

school by artists of different nations; but amidst a great many absurdities it is wide enough to include a good deal of work which is of real interest, though many of the best things are not new. Mr. Whistler exhibits a group of his works, including one of his best works, the life size portrait of a lady called an "Arrangement in Black," also a small work in his worst way, the little sketch called "The Philosopher," to the name of which in the catalogue the artist, with his characteristic assurance, appends the quotation from the *Athenaeum*, "an unpleasing thing"; as if this were enough to disgrace the *Athenaeum*, whereas most sane persons will at once adopt the verdict as perfectly justifiable. There are some fine works by Mr. Lavery, Mr. Mouat-Loudan, and others of the new school of artists, and some interesting ones by artists less known; also some sculpture studies and sketches by M. Rodin, some good statuettes by Mr. Mac-Monnies (though we cannot accept his Venus whose hair has been done in curl-papers), and some pretty bas-reliefs by Mr. Havard Thomas. The vestibule includes a number of sketches and studies, many of them of high character, and a collection of the black-and-white drawings of the late Mr. Aubrey Beardsley, which it is just as well to have exhibited in a collective form, whatever may be one's opinion of the type of art which they represent. The exhibition is at all events quite worth a visit.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

LIBRARIES OF THE MIDDLE AGES.

AN ordinary general meeting of this Institute was held on Monday, at No. 9, Conduit-street, Regent-street, Mr. H. L. Florence, vice-President, in the chair.

The minutes of the last special meeting, and the annual general meeting, having been taken as read, Mr. Jan Stuyt, of Amsterdam, was introduced to the meeting.

The Chairman remarked that it was always a pleasure to find that their meetings were sufficiently interesting for foreign architects to come before them.

The Secretary then read the following names of candidates recommended for admission, as Fellows: Mr. M. F. Cavanagh, Vice-President of the West Australian Institute of Architects, of Perth, West Australia; Mr. J. J. Thomson, Chelsea; Mr. C. E. Bateman, President of the Birmingham Association, Birmingham; Mr. J. Souttar, of Aberdeen; Mr. F. W. Lacey, M.Inst.C.E., of Bournemouth; Mr. G. C. Sherrin, London; Mr. W. B. Gwyther, Assoc. M.Inst.C.E., of the Public Works Department, Bengal Secretariat, Calcutta. As Associates: Mr. G. Benson, President of the York Society, of York; Mr. F. Peck, of Kingston Hill. As Hon. Fellow, Sir Edward John Poynter, President of the Royal Academy.

The Chairman then called on Mr. T. G. Jackson, R.A., to read a paper on "The Libraries of the Middle Ages," of which the following is a summary:—

In a preliminary allusion to the libraries of the early middle ages, when books were so rare and precious that the greatest care was necessary in their storage, Mr. Jackson said that the only large collections must have been those in the cloisters of the religious houses or collegiate churches. The earliest went back to the time of St. Benedict, in the sixth century; though there was one at Jerusalem in the third century, and the church at Hippo inherited the books of St. Augustine, in the days when the great Roman libraries were still in existence. It was on the model of the old classical libraries that those of the churches and convents were framed. Of the two kinds of private libraries among the Romans—the simple and the luxurious, which were both described—the simpler plan was adopted by the churches and convents as more fitly serving their needs, the books, for the most part, being kept in chests or locked up in presses. As the collections in,

creased, the books were divided into two classes: one being kept as a reference library, and placed in presses in the cloister where students could come and consult them, and the other consisting of volumes which were lent out to the monks to read. In this connexion the lecturer quoted a curious rule made by Archbishop Lanfranc in 1080 for the English Benedictines. As collections increased, accommodation had to be found for them. At Christ Church, Canterbury, in the fourteenth century, the books, which had increased to 698, were dispersed in cases throughout the convent wherever space could be found. The inconvenience of this to students requiring to refer from volume to volume led to the provision of a room devoted to books, and with conveniences for studying them. Between 1144 and 1143 a library was built over the Prior's Chapel at Canterbury, and another at Durham over the old sacristy; in the Abbots of Cîteaux and Clairvaux similar provision was made over the scriptorium between 1180 and 1193; at Saint-Victor at Paris, between 1101 and 1108; and at Saint-Germain-des-Prés, about 1113, over the south cloister. Buildings specially to hold their libraries were first erected by the universities and colleges. The oldest structure of the kind in England, perhaps in Europe, is the old Library of the University of Oxford, which still retains many features of its original form. This structure, rarely seen by visitors, and even unknown to the majority of Oxford men, is a two-storied building situate on the north side of the choir of St. Mary's Church, adjoining the tower at one end, and separated from the body of the church by a narrow courtyard. Having glanced at the way books were kept, used, and lent at Oxford prior to the erection of this building, the lecturer gave a sketch of its foundation, by Cobham, Bishop of Worcester, about 1320, and some incidents in its early history, following with a description of the interior, furniture, and general arrangements. Long desks were placed at regular intervals at right angles to the walls on which the volumes lay on their sides. A bench was fixed in front for the reader, and a window came between each pair of desks to light that pew or cell. Every volume had a metal clip riveted to the front edge of the board forming one cover, to which was attached a light iron chain of the requisite length, having at the other end a ring. This ring ran upon an iron rod, which was carried along the top of the desk, and was secured at the end by a hasp and padlock to prevent the ring being drawn off. The foundation of Bishop Cobham's library was succeeded shortly afterwards by that of the Library of Durham College, Oxford, by Richard de Bury, Bishop of Durham (1335-45), of whom an interesting sketch was given by the lecturer, supplemented by some humorous passages quoted from the bishop's *Philobiblon*. The books bequeathed by De Bury to the college were kept for many years in chests under the custody of scholars deputed for the purpose. At the beginning of the fifteenth century a library was built, and regularly furnished with bookcases or settles enclosing pews or studies between them, where the books were chained. When Durham College came to an end at the Dissolution, its old buildings were utilised by its successor, the present Trinity, and the old library of Durham College still serves as the library of Trinity College. William of Wykeham's New College at Oxford set the fashion for all future collegiate buildings at either University in provision being made for every department, and thenceforward every college had its library as an essential part of its plan. Though books were few, the rooms devoted to them had to be very large, the chaining of the books to the desks making it possible to have only very few on each desk. Soon, as books increased, shelves were formed behind the desks, tier by tier, until at last in the seventeenth or eighteenth century they reached the ceiling. The appearance of the fittings before that time can be well seen in the old library of Merton College, of which a description was given in the paper. Of chained libraries, which the lecturer treated at some length, there are at least three extant in England, that belonging to Hereford Cathedral being the most ancient and perfect. Old chains, hasps, and staples belonging to Hereford—specimens of the actual fittings of a mediæval chained library—were exhibited by Mr. Jackson, and the method of fixing explained. All Saints' Church, Hereford, and Wimborne Minster also possess chained libraries. But the finest in the world is that of San Lorenzo, Florence, the great hall

which was designed by Michelangelo in to contain the collection formed by several of the Medici. The lecturer then e on the difficulties of consulting books e old chained libraries. Shelves for the increasing number of books had provided, but desk accommodation ined as before. One student occupied on a volume prevented three or others getting access to the book. This to the library rooms being enlarged. isting reference was made by the lecturer ke Humphrey's connexion with Oxfo d, to his splendid benefaction of 600 books to rary in the earlier half of the fifteenth y. The new acquisitions made more odious quarters imperative, and in 1444 niversity resolved to build an upper story ew Divinity School, which, begun in as being slowly carried towards con- n. The change was at length made in hen the University library was removed he old solar or upper chamber at St. s to the new solar over the Divinity l. The lecturer then glanced at the ent fortunes of the Library, which was lled of the most valued of its treasures y Commissioners of Edward VI., and cently enriched, altered, and enlarged e second founder, Sir Thomas Bodley, at d of the sixteenth century, since whose e venerable central room has remained ally unaltered, the most attractive spot student to be found anywhere. Chains ough for the Bodleian Library as late t; and it was not till 1757 that this d of securing the books was abolished. Libraries described, more or less, were St. John's College, Cambridge; the new y finished by Sir Christopher Wren in hich forms the western side of Nevill's at Trinity College, Cambridge—a stately ng, both within and without, a triumph ish Wren's reputation as an artist; and e building of the Radcliffe Library, com- y James Gibbs in 1727. Interior and e views and details of the various build- described were shown by the lantern, ing a view of a library of the lecturer's aking, in which he had tried to combine o arrangements of cases against the walls es breaking out from them. he discussion which followed, Willis Clark remarked that it had given e great pleasure to hear Mr. Jackson's most e lecture. He would like to add a rds about libraries of religious houses. ough it was to them, especially to the ctines, that we owe our modern es. With regard to the libraries of the us orders, St. Benedict little realised how rules would be obeyed, and the amount ames his votaries would collect; and con- tly a library did not form part of the al Benedictine plan. At such monasteries, e books became too numerous, a library e arranged for wherever a place could nd. At Durham, it was over the sacristy e south transept. At the great Cistercian e at Cîteaux and Clairvaux, it was in an eudent position over the scriptorium. Libraries were, as Mr. Jackson had told all long, narrow rooms, with windows y placed; and from the catalogues of e especially that of Cîteaux, it could be out to a certain extent what the book- es were like, and he thought that they y resembled those in the library of n. Of course, they possessed desks, and lumes were chained, and therefore they ave had seats in front of them, and it distinctly mentioned that they had two s. He had not been able to discover e medieval monastic book-desk. He hoped ere some present who would find such, almost impossible to imagine that there none somewhere. From a study of e customs, it would be seen how great e care taken of manuscripts; but the e had never any objection to lending MSS. Under proper precautions; and no e preservation of French libraries e the Revolution was due to the e people had in their value and use to e neighbourhood. They could find, with e exactness, how monastic libraries e tilted up by reference to those at Oxford mbridge. Oxford was better off than ridge in that respect, because Oxford was than Cambridge, and the bookcases were e designed and were taken better care of, gh the Universities were founded to

counteract the monastic system, it was most unlikely that the one system would not borrow from the other, as the library-statutes of the colleges were unquestionably copied from those of the monasteries. Then the question arose, "How was the modern bookcase evolved from that of the Middle Ages?" The lecturer told them that it was to the genius of Wren that they owed the modern system. The first library he fitted was not Trinity College, but that by Dean Honywood at Lincoln, where the bookcases were set against the walls instead of being at right angles to the walls. Where did Wren get his idea from? He put it forward with great diffidence that he got it from Paris—at the Mazarin Library. Mazarin got the idea from the Escorial, which was fitted up in 1585, and was, as far as he knew, the first library in Europe where the bookcases were placed against the walls. He believed the idea was copied by Wren, who studied at Paris, and it was reproduced by him at Lincoln and at Cambridge. At Lincoln the older library was fitted up with great desks, which were a splendid specimen of carpentry. There was also a curious one at Wells; it was certainly built in the fifteenth century, but fitted up by Dean Bathurst after the Restoration with appliances for chaining. But chains were never used there, and this was a striking instance of the survival of forms in furniture.

Mr. H. W. Brewer said that Mr. Jackson had almost exhausted the subject. Yet might he be permitted to call attention to the will of the illustrious John Carpenter, the founder of the City of London School, who bequeathed the bulk of his library to the Guildhall, and stipulated that the books should be chained. The reasons he gave was that they should be available to the poor scholars in the City of London, who might at any time wish to consult them. The library of John Carpenter seems to have been an interesting collection. One book of special interest to the Institute was bequeathed to a relation, afterwards Bishop of Worcester. It is described as "that book on architecture, given to me by William Cleeve," who was Controller or Master of the Works to Henry V. or VI.; he added a building to the Palace of Westminster, and built that fine hall at Eltham, besides executing works at the Tower of London. Another book of special interest was called "De Renidiis Utriusque Fortunæ." In this work he spoke of how to remedy having too much money or too little money. These works were of interest to architects and other people, and he should be very glad if they found their way into the library of the Institute.

Mr. H. H. Statham wished to propose a vote of thanks to Mr. Jackson for one of the most interesting papers they had heard in that room for some time. The interesting point to architects was that he had traced out so well the influence of the practical requirements of libraries on the architectural treatment of the buildings, and shown how such an arrangement as that by Hawksmoor in one of the illustrations had been evolved by degrees from the mere arrangement of a table for books and a convenient light for seeing them. The production of some of the actual chains and bars from the old libraries, with the explanation of the manner in which they were manipulated, gave a vivid realism to the account, and almost seemed to bring them face to face with the people who studied those chained books. One could imagine the interest with which books must have been regarded at the revival of learning, when they were few in number and were the opening of a new world of ideas; as Chaucer said of his clerk,*

"Him had lever hat at his beddes hed
A twenty bookes, clothed in black or red,
Of Aristotle and his philosophie,
Than robes riche, or fidel, or sautrie."†

The phrase "clothed in black or red" gave a hint as to the favourite colours for binding ordinary books in Chaucer's time. As to bindings, he was in favour of good binding for good books. Many ordinary bindings of the present day were exceedingly flimsy. In a little book by Mr. Henry Stevens of Vermont, "Who spoils our new English Books?" a criticism on the bad get-up of modern books, the flyleaf was tagged with appropriate quotations; one of these was the following sentence from the Bible—"Whom Satan hath bound." As to some other points in regard to

books, human nature did not alter much. They did not chain books now; but only three days before he had seen posted in the hall of a well-known London club, much frequented by literary men, the following notice: "The copy of — has been missing from the reading-room for a fortnight. The member who took it away in mistake for his umbrella is invited to return it."

Professor Baldwin Brown, in seconding the vote of thanks, observed that it was quite in accordance with the traditions of the Institute that they should have one so closely associated with art and modern architecture to carry them back to the freshness afforded by a glance into the past. As to monastic libraries he believed there was an earlier one than had been mentioned by the lecturer. It was the famous library at St. Gall, in Switzerland, which dated from the tenth century.

Mr. E. W. Hudson said there was one library in which they must all feel great interest—that founded at Paris by St. Louis, who got his idea from the East. It was a pioneer public library in Christendom, and as the design of Pierre de Montreau was of considerable interest to architects.

Mr. St. John Hope, also speaking of monastic libraries, thought he might suggest in the presence of architects and architectural students that if closer attention were paid to the examination of monastic ruins, many indications would be found of the existence of these libraries. For instance, the cloisters of places like Worcester, Kirkstall, and Furness revealed recesses in the walls which, unquestionably, were used for the safe-keeping of books.

The vote of thanks having been adopted, Mr. Jackson briefly replied to some of the observations that had been offered. An architect himself, he was, he said, jealous of the reputation of Wren, and he could not assent that he borrowed the idea embodied in the Trinity College Library.

The Chairman announced that the next meeting will be held on Monday, June 6, to receive the Report of the Scrutineers appointed to direct the election of the Council and Standing Committees, 1898-99, and to discuss the Revised Paper on the Professional Practice as to the Charges of Architects.

The proceedings then terminated.

ELECTRIC LIGHTING AS APPLIED TO ARCHITECTURE.*

In addressing the members of this Association this evening on the subject of "Electric Lighting as Applied to Architecture," an explanation is, I think, due to them why I, an engineer, should venture to speak to you on a subject which professionally you are generally and rightly supposed to know far more about than engineers do. When your President-elect, Mr. George Fellowes-Prynce, suggested my reading a paper before you on this subject, I demurred on the grounds that, so far as the artistic and decorative portion of the subject was concerned, I was rather in the position of one seeking for information than one who is able to impart it; but he was good enough to assure me that the subject was of such importance to architects, and could be examined and discussed from so many points of view, that I assented, on the understanding that I might be allowed to treat the matter from an engineering point of view, and in the manner I thought most likely to impart information and provide points for discussion.

Now I assume that in this year of grace it is unnecessary for me to take up your time by dwelling upon the manifold and very apparent advantage of electric lighting over every other known form of illuminant, whether it be considered from an hygienic, artistic, decorative, or even commercial point of view, and it is generally admitted there are very few individuals—excepting, of course, those interested in gas or oil companies—who will not honestly endorse this statement. At the commencement of this paper, then, it will be as well to state that I do not propose to touch upon or refer to the subject of electric lighting outside buildings; that is, upon the generating plant or other sources from whence electric energy is brought into the building or group of buildings, but rather to confine my remarks to internal lighting and the manner in which the current should be conveyed to the various points of light.

* Prologue to Canterbury Tales.
† Psaltery.

* A paper by Mr. Tom Ekin, read at the meeting of the Architectural Association on the 6th inst.

Dealing firstly with the distribution of lights, it is obvious that the lighting of different classes of buildings requires distinctive treatment, because the lighting of a cathedral cannot be compared with that of a railway station, any more than the lighting of a ball-room or drawing-room can be compared with that of a bed-room or kitchen. Each room or space which it is intended to light should be considered and examined from at least three different points of view, namely:

- (1) The purpose for which it is to be used.
- (2) The decorations, furniture, and general surroundings, and
- (3) The cost of the proposed lighting.

Which of these three points is the most important is probably a matter of opinion, but it may safely be assumed that the third point, or question of cost, is not the least important, because it may be taken as granted that the skill of the architect or engineer in arranging a system of lighting is in no case more marked or apparent than in getting the maximum lighting effect at minimum cost, this minimum cost including not only the first cost of putting in the work, but the more important one of annual expenditure and renewals.

When considering the question of lighting new buildings by electricity, the subject can be treated and dealt with with a far freer hand and, generally speaking, with far greater effect than in the case of houses at present lighted by gas or other form of illuminant, because one is so very apt to take the positions at present held or assigned to gas as those most suitable for electric lamps, quite forgetting the fact that gas is so non-adaptable and lends itself with such ill grace to artistic effect that there are only certain positions in any room in which it can safely be placed. Now I shall assume as an axiom, that the most perfect form of lighting is that evolved from a hidden system of lamps, in other words where no portion of the lamps themselves are brought in direct contact with the retina of the eye. It is, however, only right to point out that this form of lighting, like many other nice things in this world, is, generally speaking, the most expensive, because, as a rule, it means the placing of the lamp or lamps under some form of shade, whereby a large portion of the illuminating power is lost, and, therefore, and in order to get the same effect or amount of light from hidden lamps as from ordinary unshaded, or only partly shaded lamps, double or even treble the amount of energy has to be used. In public halls, concert rooms, churches, &c., the points of light can, if taken from the ceiling or roof, be raised sufficiently far above the heads of the audience that, unless they wantonly gaze at the lamps, no inconvenience to the eyes need necessarily be felt, but it is different in the case of ordinary rooms, be they drawing-rooms, boudoirs, or dining-rooms; and it is these classes of rooms which, in my opinion, require the most careful thought as to the disposition and arranging of the lamps.

In dealing with this matter, it is, perhaps, unnecessary to say that I am dealing solely and wholly with the incandescent electric lamp, and that I do not propose to touch upon the question of arc lighting this evening, because, though this light is pre-eminently suited for streets, railway stations, and other similar places, it is not, and, I believe, never will be, suitable in any way for the internal lighting of buildings. Many of you here this evening must, at some time or other, have been struck with what is generally termed the "glare" of the electric light, and may possibly have thought that this was one of the inherent faults of the system. I need hardly say it is nothing of the sort, and the fault lies, not in the system, but in the brain of the stupid person who put it there. No sane man or woman, with any regard to their eyes, willfully stares at the noonday sun; but I submit it is just as idiotic to put up a clear electric lamp and gaze at it as it is to gaze at the sun. Electricity, like most other things, to be properly appreciated must be suitably adapted to the end in view, which, as before stated, is a diffusion of soft light, without the lamp from which the light emanates being brought in direct contact with the eye. I am fully aware that the cost of complying with this requirement is in many cases too heavy to allow of its being adopted, but I submit there is no reason why every electric lamp should not in some form or other be shaded, even if the shading is simply the putting in of an "obscured" lamp in the place of a clear one. It is evident, or at any rate should be evident, that the lighting of each particular room or space should be separately con-

sidered, and that being so, it is impossible to lay down any hard-and-fast rules as to what is necessary in each particular case; and it requires a certain, or I may go even so far as to say a good deal of practical experience and judgment to know the proper amount of light required, and also the position in which the lamps should be placed. Under these circumstances, therefore, I fear it is quite impossible for me to lay down any rules which would be of the slightest value in enabling you to properly arrange for the lighting of any building in which you are interested. There are, as you are doubtless aware, certain "rule-of-thumb" rules which are given in pocket books and similar literature, but I have never found them to be of the slightest value; but, on the other hand, rather misleading. Take, for instance, a drawing-room. What use is it to anyone to know that a 16-candle power lamp will light a certain number of square feet of floor when raised a given height above it? In my opinion none, for the simple reason that it is quite impossible to take into calculation or make due allowance for the surrounding colouring of either walls or furniture.

Leaving artistic effect out of the question for the moment, it is evident nothing is easier than to drop a number of pendants from the ceiling, and if these are kept a certain distance from the floor, you can procure the maximum amount of light with the minimum number of lamps and cost. This mode of lighting is, however, not to be recommended; indeed, it is strongly to be deprecated, and when one sees a room lighted in the above manner it is at once apparent that a Goth, Vandal, or other barbarian, has had the arranging of the lights. I think it will be generally conceded that the most pleasant, and at the same time, most artistic method of lighting ordinary living rooms is by means of wall brackets, standard lamps and table lamps, the lamp in each case being shaded so as not to come in direct contact with the eye. With regard to the other rooms in a house, there is not, as a rule, much difficulty in assigning the right position for the lamps and their numbers, but at the risk of reiteration I would again impress upon you the desirability of considering the lighting of each room, or at any rate, of each principal room separately and from the three points of view mentioned at the beginning of this paper.

Now the next portion of my paper has to deal with the manner in which the electric current is brought from the place where it enters the building to the lamps themselves, in other words that portion of the work generally spoken of under the comprehensive term of "wiring." As you are doubtless aware, this word "wiring" includes not only the supplying and laying of the various wires and cables, but also—at least as a general rule—the switch and fuseboards and subsidiary switches, and occasionally the necessary "cutting away and making good," this latter expression being in many cases incorrect, as you, like myself, have probably found by experience that it could be more accurately described as "hacking and tearing away, and not making good." Many of you have doubtless had before you the tenders of some electric lighting contractors for the lighting or wiring of certain buildings, and perhaps have even gone so far as to draw up a common specification to which these various firms have tendered, and you have doubtless been surprised to find that the highest tender is sometimes half as much, and in some instances, as much again as the lowest, and furthermore have been puzzled to know what should be done under the circumstances. Of course, if no specification has been issued, the reason of the difference in prices is easily explicable, inasmuch as the contractors having no common basis upon which to draw up their tenders, simply send in an estimate for the work and material they consider necessary, with the result that if the contractor is an honest man, taking proper pride in his work and with a reputation and good name to lose, his prices must be, and always are considerably higher than those of an individual whose commercial instincts have unfortunately prevailed and got the better of his moral ones. It is far otherwise, however, if the contractors have tendered to a common specification, because if there are great discrepancies in the tender, it is evident either that the individual quoting the lowest figure is willing to forego all profit, or else that the one quoting the highest figure intends to make a fortune. Neither of these hypotheses are probable or ever likely to occur in practice, and it will generally be found that the real cause of

the differences may be found in the loose and unscientific manner in which the specification has been drawn up. For a skilful and perhaps unscrupulous contractor nothing is easier than to drive a coach and four through a loosely and inaccurately drawn up specification, whilst it is evident that even an honest contractor—being but human—will avail himself of every opportunity in interpreting an ill-drawn clause to his own advantage. Perhaps I may be considered wanting in courtesy in suggesting that you are likely to draw up a faulty specification, but I can assure you nothing is further from my thoughts, and my only object in speaking thus plainly, is to insist upon the absolute necessity of drawing up the specification in the most careful manner and with a full knowledge of all the requirements necessary and incidental to the proper carrying out of the work. My experience has been that many points of vital importance to the work are—probably from want of technical knowledge—entirely omitted from many specifications, and others of no technical importance are treated with a fulness and amplification entirely unnecessary. What is the use of carefully specifying the density of current allowed per square inch of sectional area in the copper conductor, when the loss of pressure, or to use a more technical phrase, the fall in voltage, or electro motive force is omitted? None whatever, because in the case of a light, or group of lights, placed at some distance away from the source of supply, or point from whence the electric energy is brought into the house, the contractor might possibly be carrying out his work strictly in accordance with the specification, and yet the lamp or lamps would look like "hot hairpins" owing to the fact that the very essential point of loss of pressure had not been taken into account. Again, what is the use of specifying the most heavily insulated wire and omitting the final test when the work is completed. Instances like these could be given *ad libitum*, but for the purpose of argument this is unnecessary.

There are still two points upon which should like to give a warning, and these are firstly, the low-priced contractor who looks to make his legitimate (or, as some would say, his illegitimate) profit on fittings; and, secondly, the contractor who offers to put in the work so that it will comply with the ridiculously low requirements—I refer to the test of the insulation resistances—of the fire offices. In London and other towns where there are electric supply companies, this latter danger is to a large extent rectified and guarded against by the fact that all work has to pass the reasonable standard of the supply company, but it still remains in the cases of country houses, and houses in towns where the owner or occupier generates his own electric energy. This paper, I fear, may seem to you to contain little or no information, but its title precludes any technicalities and, therefore, I have confined myself to general statements which, even if not useful, may, at any rate, fulfil the desired object of raising and providing points for a discussion.

Mr. G. H. Fellowes-Pryne, in proposing a vote of thanks, said that in his opinion it was absolutely necessary for the architect of a building to call in an electrical engineer when electric lighting work had to be done. He said this with considerable experience of electric lighting, and he felt his own inefficiency when work of this kind had to be executed. The architectural effect, however, should be left to the architect. As to specifications, what the lecturer had said was perfectly true, for he, the speaker, had seen specifications of electric lighting work which had been written by architects, which showed great ignorance of the subject. If architects thought that they could, in addition to all their other works, take up that of electric lighting, i.e., the technical, thought they were overrating their powers. To the question of hiding electric lights in public buildings, as the lecturer had said, it was satisfactory to keep the lights fairly above the heads of the people, and so not bring them into direct contact with the eye. In that room they had illustration of placing the lights above their heads, with the most glaring and unsatisfactory result; the lights looked like red-hot hairpins, as they fixed themselves on the retina of the eye. Their idea must not be to get the maximum amount of light; it should be power, light subdued, though that might be very well sometimes. As to brackets and shades, lamps they looked very nice in drawing-rooms

but he did not think they were always satisfactory. He did not like brackets. If they hid the lights in the ceiling, or at some points, he thought that most satisfactory results could be obtained. Patches of light were to be avoided, such as were often to be seen in drawing-rooms, for they distorted the architectural proportions of a room. They applied electric lights to each particular part as the lecturer had said.

Mr. Sim seconded the vote of thanks, and said in regard to obscuring light, no one ever thought it strange to put a shade over gas lamp, but when a shade was used over an electric light it was frequently said that energy was being wasted.

A. S. Flower said that there was no time to do anything to the discussion, but he felt that the author of the paper had been present in the evening he would have been shocked at the manner in which that room was lighted. The Chairman said it was always interesting to hear what an engineer had to say on architectural matters, but he would like to have the subject well handled by an architect. He would like an architect of experience to give his ideas on the best way of utilising the electric light; how to wire a building without spoiling the architecture, which some electrical engineers did not seem to consider at all. When Mr. Prynn had said, he, the Chairman, supposed that he was in favour of electric lights, but a word might be put in not for brackets, then for what Mr. Hare Mr. Mounford had done in some of their buildings, where they had used dropped plants and had secured some charming results. Some such method might be utilised, thought, for electric lighting instead of forms of chandeliers, as was often done. Mr. Prynn said he should like to add that he felt that the engineers ought to be called in for the motive power, &c., and that architects should have the absolute control of fittings and their positions.

The Chairman, in putting the vote of thanks to the meeting, proposed that their thanks be ordered to Mr. Carvill for reading Mr. Ekin's paper, in the author's unavoidable absence.

Having been agreed to, the Chairman announced that the next meeting would be held on the 20th inst., when A. T. Walmisley would read a paper on "verside Foundations," and at the same time the result of the election of officers will be announced, and the award of the A.A. Studentship would be made. The meeting then terminated.

MAGAZINES AND REVIEWS.

The current quarterly number of the Berlin *Zeitschrift für Bauwesen* contains matter of very varied interest. An article on the handsome Government offices at Osnabrück, which were finished in 1896, occupies the front place, and is illustrated by two half-tone blocks in the text, and by reproductions of the plans and sections in the accompanying atlas of plates. The second paper appeals to the antiquary; it is an illustrated account of the sinking from the Rathaus in Bocholt, erected in 1610; there is a measured drawing of this in the text. Prof. Konradin Walther's Art School at Lemberg is next described and thoroughly illustrated; after which we have an almost too short account of the very interesting early sixteenth-century Sexton's house at St. Florin's church, Coblenz. A paper which follows on a view of iron bridge, bristling with mathematical formulae and abstruse diagrams, is a startling change from the quiet old-world Romanesque of the Coblenz building. An exhaustive paper on the Kaiser Wilhelm Canal follows, illustrated by elaborate double-page diagrams in the atlas. There are other articles besides these we have mentioned; but we need say no more in commendation of this very handsome and valuable periodical.

The *Architectural Record* contains an article on the Mairies of Paris, by Mr. F. Mazade, a subject of considerable interest, elucidated with good many illustrations of these buildings, which are among the best productions of modern French architecture. Mr. Russell Sturgis writes on "The Art of William Morris" on the present standpoint, which will be modified sooner or later, though people do not seem to be told so now. A large portion of the number is taken up by an account, with illustrations, of the work of the American architect, F. H. Kimball.

The *Architectural Review* (Boston) publishes

as its illustrations working and detail drawings of the Court House and Post-office at Paterson, by Mr. Taylor, the Supervising Architect of the Treasury, which are of more interest than official architecture in this country generally is; and illustrations and plans of a building of similar class at Camden, by Messrs. Rankin & Kellogg; this latter is an orthodox classic structure, with a very refined detail perspective of the columned porch, but certainly little originality of treatment anywhere. Mr. Clipston Sturgis contributes a well-judged article on the pleasing subject of "The Garden as an Adjunct to Architecture."

Among the contents of the *Art Journal* is an article on "Mirrors and Frames" by Mr. E. Guy Dawber, with illustrations of various rather typical ancient examples. Among deceased painters G. Barrett, and among modern ones Mr. G. Brough, are the subjects of articles, and the series of "The Royal Academy in the Present Century" deals with Smirke and Westmacott.

Among the contents of the *Studio* (April) are articles on the work of Mr. Heywood Sumner and on M. Harpignies, with reproductions of some of the original landscape sketches of the latter. The May number contains an article in memory of that clever but wrong-headed and much over-rated artist the late Mr. Aubrey Beardsley, and some sketches and a description of Mr. Harrison Townsend's curious and picturesque house "Cliff Towers," designed we should say under American influence, but none the worse for that.

The *Magazine of Art* also has its article on Aubrey Beardsley, by Mr. Aymer Vallance, and much more enthusiastic than we can go with. A subject of more interest is the work of M. Roly, the great French medallist, with a number of illustrations of the medals modelled by him.

The *Gazette des Beaux Arts* includes the second and concluding portion of an article by M. Emile Bertaux, on "Le Toubrou d'une Reine de France" at the cathedral of Cosenza, in Calabria, a monument executed by French hands in memory of Isabella, queen of Philip the Bold. There are some interesting details as to the style of the cathedral, which contains, it is said, singular archaisms of manner, along with details which, occurring in France, would be attributed to the thirteenth century. Other articles are one on the atelier of M. Rodin, the sculptor, with a good many of his own sketches, and one on various portraits of Marie-Antoinette.

The *Artist* gives what is called a Royal Academy number, though it deals with other exhibitions as well, but the number of reproductions of sketches and studies for pictures in the Royal Academy gives a special interest to the number.

The *Engineering Review* includes articles on Architectural Steel Construction, on the Purification of River Water, and on "Finding and keeping Shop Costs." As this appears to be a description of some American systems, it may be of interest to English employers to see if they can gain any suggestions of value from it.

Under the title "The Understanding of Architecture," the *Edinburgh Review* devotes an article to the review of several recent books on architecture, viz., Mr. Blomfield's "Renaissance Architecture in England," Mr. Hamlin's "Text Book of the History of Architecture," Mr. Anderson's "Architecture of the Renaissance in Italy," and Mr. Statham's "Architecture for General Readers" and "Modern Architecture." As the title implies, the article treats of architecture mainly from the point of view of education of public taste and knowledge in regard to the subject. The following quotation from the conclusion of the article will give an idea of the position taken by the author:—

"There are many arts and sciences upon which people hesitate to give opinions without previous study, even though the raw material of the art or science be a matter of everyday observation. In spite, for instance, of our familiarity with the heavenly bodies, it is uncommon to hear astronomical theories discussed in the club smoking-room, in spite of our still greater familiarity with our own human frames, we are wont to argue physiology with the doctor. But architecture, says the man in the street, is another matter, and unless he shrinks from considering the art at all, he leaps to judgment unprepared, or perhaps criticises, on the strength of a month's cram in the art in which a true learner takes ten years to discover his own ignorance. Many men will pass judgment on a building whose criticism is of no more value than the opinion of a nursery governess on a doubtful passage in Pindar, yet so apparently transparent are the secrets of the art that you will never persuade them of their incapacity."

Architecture is very like language, and style in architecture is very like style in prose, yet there is many a well-constituted arbiter of propriety in building who has not yet gone so far in the study of his subject as to discern among the elements of the work he attempts to analyse what is inspiration, what is composition, what is grammar, and what is merely orthography.

Let him read the books which head this article, and he will be in a fair way to grasp not the whole knowledge of the art, but some of the issues with which he has to deal."

The *Quarterly Review* contains a weighty article on "Trade Unions in Practice and Theory," of course prompted partly by recent events, but taking the shape of a review of Mr. and Mrs. Webb's "Industrial Democracy." The *Review* "recognises in the Trade Union movement a passionate rebellion, with the inner meaning of which we heartily sympathise. The same intrepid spirit, which has prompted so many fruitless sallies against the windmill of capitalism, will, we hope, some day be directed to a more hopeful enterprise."

An article on "Prehistoric Arts and Crafts," in a part of which the author attempts to realise, from prehistoric remains, the process of evolution of various implements, some of which are not essentially different in their modern forms, is of more than average interest.

The *Nineteenth Century* contains an article of considerable interest by the late M. Yriarte, on "Personal Recollections of Meissonier." It gives, among other interesting facts, a good many examples of the extraordinary pains which Meissonier took to arrive at complete realism in the detail of his pictures. In his house in Paris he constructed in various corners models of buildings, &c., intended to serve as backgrounds, and which he drew from different points of view for different pictures. He established a ride in his garden with a little tramway parallel to it, where a horseman would be made to ride a horse at different paces, while the artist was pushed along a waggone on the tramway parallel to the animal, so that he could keep an eye on its every action. With the same object he used to take long rides with his son Charles, the two keeping abreast of each other at a sufficient distance apart for the painter to be able to observe the action of his son's animal. For the groundwork of the picture "1807," where the cavalry charge passes over a cornfield, Meissonier actually purchased a whole field of standing corn, and persuaded the colonel of a dragoon regiment to lend him a troop of men to gallop over the field so as to see the effect. Such were the studies on which the fame of the greatest realistic painter of the age was built up.

Scribner, under the heading of "The Field of Art," prints an interesting little discussion between two writers, "K. C." and "R. S.," on "The Lesson of the Photograph." R. S., whom we take to be Mr. Russell Sturgis, makes some good remarks in regard to the comparison of photographs of nude models with actual artist's work, showing how completely the nude figure in art is a conventional thing.

The *Century* includes an article on "An Outline of Japanese Art" by Mr. E. F. Fenollosa, "with unique and unpublished examples;" some of these are very curious and interesting. In the same number is "Railway Crossings in America;" No. 2 of the "Seven Wonders of the World," being the Pyramids, about which (as may be supposed) no new information is given; and a useful article by Professor Trowbridge, entitled "What are the X-Rays?"

Harper contains an article summing up the history of "The Trans-Isthmian Canal Problem."

The *Revue Générale*, in its illustrated article, deals this month with the subject of "Rembrandt at Cassel," treated by M. Geo. Verlaet, with eight illustrations from Rembrandt's works. It may interest our readers to learn that the subject of the new legislation in England in regard to compensation for accidents to workmen is fully treated in an article by M. Léon Rigo, who gives a good outline of the whole position of the subject in England, and sums up in favour of the recent law. The subject of English enactments on this head is evidently regarded with interest in France.

The *Pall Mall Magazine* for June (already out) —we shall not know which month is which presently) contains another instalment of Sir Walter Besant's London articles, on "South London." These are interesting reading, but we are rather sceptical as to their historical value; they savour somewhat of book-making. "The

Evolution of Comfort in Railway Travelling," continued from the last number, is a subject of practical interest to most of us.

Among the contents of the *Antiquary* are "Old Sussex Farmhouses and their Furniture," by Mr. J. Lewis André, and "French Glass Makers in England in 1567," by Mr. E. Wyndham Hulme.

The *Essex Review* (quarterly) gives an account of "Recent Additions to Essex Beltries."

We have received several illustrated publications in connexion with the annual exhibitions; the *Studio* "Record of the art of 1898" and a special "Paris Salons" number (which latter, however, seems only to have secured the minor works and not the great ones) two numbers of "Royal Academy Pictures" (issued by the *Magazine of Art*), and the *Art Journal's* "Pictures of 1898," on a rather smaller scale. As to general execution of the illustrations there seems little to choose between the various publications.

We have also received *Knowledge*, the *Geutleman's Magazine*, and two issues of the *Genealogical Magazine*.

THE LONDON BUILDING ACT: TRIBUNAL OF APPEAL CASE.

At the Tribunal of Appeal offices, on Monday, Mr. H. Gundry, of Paddington, appealed, under the London Building Act, 1894, on behalf of Mr. Henry Ward, against the disapproval of, and the refusal of the London County Council to sanction (under Section 42 of the Act) the plans, dated March 15, 1898, of a building not abutting upon a street, and adapted to be inhabited by persons of the working class, such building being shown to have stabling on the ground floor at the rear of 417, 419, and 421, Edgware-road, and an entrance through the ground floor of No. 118, Hall-place, under the provision of Section 42 (5) of the Act. The members of the Tribunal sitting were Messrs. A. Cates (Chairman), J. W. Penfold, and A. A. Hudson. Mr. McMarran, Q.C., and Mr. Alexander Glen represented the appellants, and Mr. Seager Berry the London County Council.

Mr. Glen, in opening the appellant's case, said it raised simply a question of the construction to be placed upon certain clauses of the Act. The building in question did not abut upon a street, being, in fact, between Edgware-road and a road called Hall-place, but there was access to both roads. The building consisted on the ground floor of a repository for horses. Above that were some flats, each tenement consisting of four rooms intended to be let from 10s. to 16s. per week. That rental, it was true, was rather above the usual rental paid by the working classes, but still the claim that the building was to be inhabited by the working classes was not in dispute. It was at Sub-Section 2 of Section 42 that the question of difference began to arise. It provided that in any case where the County Council were satisfied that there would not be provided above such building sufficient open space for the admission of light and air it should be lawful for such Council to refuse sanction to build. If an appeal were based upon the suggested wrong exercise of that discretion, then it would be for the Tribunal to say whether there was sufficient open space or not. But, as a matter of fact, that question did not arise in the present case. They then came to Sub-Section 2 of Section 41, which prevented the Council refusing their sanction in a case where the builder had complied with the provisions relating to dwelling-houses abutting on a street formed or laid out before the commencement of this Act. The question which the Tribunal would have to determine was, whether in the proposed building his clients had complied with the provision relating to dwelling-houses abutting upon an old street. That provision read: "With respect to domestic buildings erected after the commencement of this Act abutting upon a street formed or laid out before the commencement of this Act the provisions of this section shall apply, with this modification that the horizontal line shall be drawn throughout at a level of 16 ft. above the level of the adjoining pavement." In dealing with the plans in question, Mr. Glen said it was admitted that the horizontal line would be such as demanded by that section. Further, Sub-Section 1 made it necessary that there should be provided in the rear of every such building an open space exclusively belonging to such building of not less than 150 sq. ft. He did not think there was any question arising as to that matter, as that amount of open space had been provided for. Again, the second section of Sub-Section 1 stated that where there was no basement story, but where the ground story was not constructed or adapted to be inhabited (as in the present instance), then the open space required might be provided above the level of the ceiling of the ground story, or at a level of 16 ft. (exclusive of lantern-light), measured from the level of the adjoining pavement. It was not disputed that his clients had complied with that. This being the case, he failed to see what grounds the Council had for refusing sanction to the building, and he asked the Tribunal to sustain the appeal.

Mr. H. Gundry, Paddington, the architect for the building in question, then gave evidence, in the course of which he contended that all the conditions of the proviso of the Act had been complied with. In cross-examination, he stated that the building of the stables had been commenced without consent having been received from the Council.

Mr. Seager Berry, in stating the case for the Council, said, as usual, they seemed to be embarking on a question of law. But he submitted that no real substantial question of law need arise. In reading Section 42, he submitted the position was this: An applicant came to the Council and asked for sanction to erect a working-class dwelling, which did not abut upon a street. The whole proceedings went on the assumption that nothing had up to that time been done. They had got to gather what was going to be done from the documents and plans. The appellant had all along treated the building in question as one building, inclusive of the horse repository, and he asked the Tribunal to hold that it was unnecessary that he should come there that day, and suggest that it might be two.

Mr. Glen said he was quite prepared to treat the building as one building.

Mr. Berry, proceeding, said the appellant was not relying upon any merits of the case. His contention simply seemed to be to this effect: "I am inside the proviso, and the County Council are bound, therefore, to allow my plans." And he seemed also to say in effect that the Tribunal was bound to allow his appeal. But even if he were inside the proviso, the Court was not bound to grant the appeal, because it had been held in the case of *Queen v. the Council, ex parte Webster*, that if a person commenced a building which required consent (as had been done in the present case) before that consent was given, the Court was not compelled to uphold the appeal.

The Chairman pointed out that Mr. Gundry had said that the erection of the dwelling-house had not commenced.

Mr. Berry, in reply, said the building of the stable had been commenced, and as the stable was part of the dwelling house, the building of the dwelling house had in fact been commenced. Proceeding next to consider the proviso, Mr. Berry contended that this had not been complied with by the appellant, as the amount of open space provided was not equivalent to the amount which would have been provided in case such building had been commenced before the commencement of this Act, and in case it was abutting upon an old street. "Open space or spaces" must mean the equivalent of 6 1/2 ft. clear, with allowance for street on the one side, and allowance for the street on the other. As a matter of fact the appellant had made no allowance at all in the front for the street.

Mr. Gundry: There is a space there of 40 ft.

Mr. Berry: Yes, but that is counting in the back yard of the next house. You may have allowed 504 ft. more behind than you need have done, but you have 1,040 ft. less in front than you should have. Concluding, Mr. Berry said his contention was that the building was one building, that the whole was a dwelling-house, and that the appellant had, therefore, not complied with the terms of Section 42, inasmuch as he had commenced to erect such dwelling-house before having received consent. Further, he had also not complied with the proviso as to open space.

Mr. Glen, in his reply, contended that his client had not commenced illegally to build. The stable was not the dwelling-house portion of the house.

The Tribunal, after a moment's consideration, said they had come to the conclusion that they must dismiss the appeal, but they would make no order as to costs.

ADMINISTRATIVE BLOCK, ST. MARLYBONE WORKHOUSE.

The Lord Bishop of London opened yesterday (Friday) the new central administrative block of St. Marlybone Workhouse.

In 1896 the erection of the administrative block of buildings was commenced. The front elevation facing Northumberland-street entrance has been so arranged as to be in keeping with adjoining buildings, the centre portion being faced with red brick and Portland stone dressings; the old clock and peal of bells which were taken out of the demolished buildings have been remodelled to suit their new position. Above the clock an octagonal belfry has been formed for the bells, built in English oak, and covered with lead, and terminating with a weather vane. The two wings, with towers at either end, are faced with white Arlesley bricks, red brick band, and Portland stone dressings.

The new building stands upon the site of the original administrative blocks and chapel, which were pulled down in the latter part of the year 1896. It is designed to concentrate in one block the whole of the Administrative offices (except the laundry) of the workhouse, and such parts as are used in common by all the inmates. The two wings contain also special wards, which it is desirable to separate from the other blocks. Placed opposite the entrance gates, the main front forms one side of the entrance administrative court. The principal entrance in the centre leads by a short and wide passage to the visiting committee's

room, in which the Guardians will meet weekly upon the business of the house, and to interview inmates, for whom two waiting-rooms are provided in place of the original draughty and constricted passage. On either side of the entrance are respectively offices for the master and matron and master's clerks, and medical officer's consulting room. The offices are so placed as to command the whole of the administrative court.

In the rear of the block, and approached by two corridors from the front, is the general dining hall, 120 ft. in length by 50 ft. in breadth, and capable of seating over 1,000 inmates at meals. The hall divided into a nave and two aisles, and is lighted in the daytime by eighteen semi-circular clerestory windows and others in the west aisle. The walls are faced with glazed bricks relieved by a dark dado and coloured bands. The roof is open timber and the panels are decorated in stencilled colour. Adjoining the dining hall is the general kitchen, fitted up with steam and gas apparatus for cooking for 2,000 people at one time. The room is lighted and ventilated from the top by a lantern, and the walls are faced with glazed tiles. There are two hatchways between the kitchen and the dining hall. The scullery adjoins the kitchen, and is fitted with eight porcelain sinks, with hot and cold supplies to each.

The wings on either side of the central block contain, on the south side, the matron's drapery store, cutting-out room, and a long needle room for inmates; and on the north side, a row of workshops for boot-making, tailoring, and other light trades. The basement provides accommodation for stores. On this floor also is a large bakery. At the north-west corner of the building is the boiler house and a 100 ft. high chimney shaft and smith's workshop. The boiler house is fitted with three double-flued Lancashire-type boilers, made by Tinkers, Limited, of Hyde, near Manchester. These are capable of working at a daily pressure of 80 lb. on the square inch, and will supply enough steam to heat the whole of the buildings on the site.

Adjoining the entrances to the main corridor on the ground floor, are two staircases, which lead up to the first floor, and give access to the chapel, chaplain's room, and library adjoining, which are placed over the centre of the block. The chapel is seated to hold 550 people. At the west end there is a gallery, upon which an organ (by C. H. Walker) has been placed. The walls are faced with buff glazed bricks, above a dark tiled dado, and relieved with bands of red pressed bricks and green majolica strings. The open timber roof is constructed of pitch pine and yellow deal, slightly stained and varnished. The floor is laid with pitch pine blocks, the chancel being paved with glass mosaic.

The south wing contains on the first floor, a female sick ward for special cases, also isolation wards; and there is a similar ward for males in the north wing. The remaining parts of the first floor of both wings, and also the second floors, are occupied by maternity and convalescent wards and dormitories for mothers with infants. These wards are approached by two staircases (one in each wing), which are fitted with lifts, worked by water pressure from the mains of the London Hydraulic Power Company. The maternity wards comprise two separate and distinct wards, cut off from one another by cross-ventilated passages, and each has a small labour room adjoining it. Means of escape from fire are provided on the upper floors by the provision of light iron bridges connecting the two blocks. All the wards, large rooms, and chapel are heated by low-pressure hot water pipes, circulating from steam heaters in the basement. The system is so arranged that each room can be shut off from the others. And in addition, the large wards are fitted with large air-body ventilating stoves and thermohydric stoves. The ventilation of the wards is effected by means of numerous inlet shafts and outlet flues at ceiling level. The dining hall is heated by steam coils round the walls. All other rooms are fitted with open fires. Four large tanks, each with a capacity of 2,000 gallons, are fixed in the towers at each corner of the building. The whole of the building is lighted throughout by electricity, but gas is provided at various points in case of necessity.

The buildings have been erected (from the designs, and under the superintendence, of Mr. Alfred Saxton Snell) by Mr. Charles Wall, of Woking, whose contract for the work amounts to £8,500. The clerk of works was Mr. Frederick W. Lee, and the general foreman was Mr. W. Morgan.

The whole of the general engineering work, including the fitting up of the kitchen, has been carried out by Rosser & Russell; the electric lighting by Joel & Co.; valves by Dewrance & Co.; the hydraulic lifts by Waygood & Co.; floor tiling by Minton & Co.; wall tiling in kitchen by Minton & Co.; wall tiling in chapel and principal entrance by Simpson & Sons; glass mosaic floors and walls in chapel by J. Rust & Co.; wall tiling in bath-rooms by the London Opal Tile Co.; glazed bricks in chapel, dining hall, &c., also porcelain baths, by Farney Iron Company; fanlight openers and gearing by Leggett Bros.; granolithic floors by The Imperial Stone Company; the whole of the roof glazing provided and fixed by the British Challenge Glazing Company; thermohydric and air-body stoves by Potter & Sons; boilers by Tinkers, Limited; and the electrolights in dining hall and chapel, and sanitary fittings, by Emanuel & Sons; the stained glass in the

chapel by Fry & Sons; the church furniture by Hammer & Co.; and the Benet Furnishing Co., who also made the dining hall seating and tables. The decoration of the dining hall was executed by Mr. Herrmann. The quantities and measurements were carried out by Messrs. Northcroft, Son, & Neighbour.

In completion of the scheme of the Guardians for remodeling and improving the workhouse, a contract has just been concluded with Messrs. Gwyathers & Sons, for the erection of a new block of buildings on the Marylebone-road side of the workhouse at an estimated cost of \$9,348l.

THE SURVEYORS' INSTITUTION.

A MEETING of the Surveyors' Institution was held on Monday in the temporary premises of the Institution, Savoy-street, Victoria Embankment, when the paper read was by Mr. H. T. Ewe, and was entitled "Compensation Values of Cattle Foods—Chemist v. Valuer."

The following Student Candidates have passed the Examination for the Professional Associateship:—

A. G. Andrews, Chester; H. B. Baverstock, London; E. C. Bedwell, Carlton Colville, near Lowestoft; C. W. Berry, Wimbledon; G. A. Blyth, James; T. E. Butcher, St. Albans; H. F. Carr, Valentin Abbey; F. L. Chattell, London; F. S. Chester, Kensington; N. Clark, jun., Durham; Constable, Wandsworth; F. H. A. Lancaster, Goscombe; C. R. Field, Anerley; N. M. Foulkes, Ring; G. E. H. Graham, Hampstead; J. E. Ripper, Battle; R. C. Hassett, London; J. F. Hawkins, Bromley; H. Heal, Pinner; H. C. Leach, Blackheath; H. Hinks, Croydon; M. G. Lumpley, Kingston; R. E. Jackson, Carnforth; R. Johnston, Swindon; R. Leake, Wood Green; Lewis, St. Albans; D. Lloyd, Brixton (Institution prize, 1898); F. R. Lumley, Downton; W. M. Marcus, New Wandsworth; F. R. Mark, Forest Gate; E. E. Meacher, Barnet; S. G. Meacher, Malvern; Link; S. S. Orchard, Leek; F. A. Pearce, Willesden Green; T. W. Pearce, Modbury; C. E. Pease, Wimbledon; C. O. Rawinton, Rotherham; F. Redfern, Northfield, near Birmingham; R. G. Reed, Croydon (special prize); W. F. Robbins, rockshard, Wingham, near Dover; S. Searle, aling; H. Sheldon, Middlewich; H. O. Stallard, Eighnton Buzzard; W. W. Tremlett, Downton; W. E. Weall, Watford; C. S. Weekes, Tunbridge Wells; H. Welsh, Cokermonth; H. G. B. Wyatt, hichester; J. D. Young, Highgate.

The following Non-Student Candidates have also passed the Examination for the Professional Associateship:—

A. Allsbrook, Wollaton; H. G. Andrews, Chelsea; H. Angel, Kensington; E. G. Attlee, Upper Tooting High-road; A. E. Bache, Blackheath; C. C. Baker, Lewes; S. A. Barnes, London; L. Barrett, Southampton; C. W. B. Barton, Wimbledon; R. B. Betenson, London; J. C. L. Bettridge, Wimbledon; T. Bibbey, Llandudno; A. E. Bradshaw, Ramsgate; A. A. Brown, Croydon; T. Brown, Whitehaven; C. F. Burroughes, Middleham; A. K. Burtonshaw, Hailsham; R. R. Burton, London; H. Campbell, Eaton Hastings, Faringdon; S. D. Chadwick, London; F. J. Cole, Bristol; C. G. F. Culverhouse, London; C. T. Darnell, Blaby; G. C. Dawson, Nuneaton; F. E. Dyer, Lewes; A. R. Ellis, Bedford; H. H. Foster, Accrington; R. S. Gardiner, Aberystwith; J. S. Goodby, Highgate; O. J. Healing, Highgate-road; C. S. Lodge, Nottingham; M. M. Holl, Northampton; A. W. Hudson, Walthamstow; J. A. Jones, East Acton; P. E. Jones, Ealing; C. F. Johnson, Nuneaton; F. H. M. Jones, Fairford; Gloucestershire; A. Morris, London; H. T. Mullett, Cambridge; J. O. Nesbit, Levenshulme; G. M. Nicholson, London; J. Nutter, Whitehaven; C. Priest, Dring, Wye; D. F. Pearce, London; A. T. Priest, London; A. C. Robertson, Battersea Park; W. Rogers, Putney Hill; F. R. Seller, Bromley; J. Smith, Maidstone; G. H. Smith, New Malden; P. W. Smith, Finsbury Park; J. McC. Spinkman, Finsbury; F. W. S. Stanton, Chatham; F. S. Sutton, Brixton Hill; H. Swan, Upper Tooting; C. J. H. Thomas, Hampstead-road (Driver Prize and Penfold Silver Medal); W. J. E. Thomas, Oakridge, near Cardiff; W. E. Trent, Stratford; M. H. Ward, St. Helen's; H. A. C. Warrington, London; G. F. Weatherill, Edensor, Bakewell; R. S. Wigman, London; P. L. A. Williams, Battersea; J. Wilson, Richmond. Irish Candidates.—H. E. Kincaid, Dublin; L. Waring, Warrington, Co. Down; H. R. B. Wood-Martin, Dublin.

The following Professional Associates have passed the Fellowship Examination in Division V:—

F. S. A. Banks, Stamford Hill (Penfold gold medal); L. Barker, Lyndry, Rossett; P. S. Bidwell, Ely; L. Blackshaw, Kilburn; E. H. Blake, Balham; E. Blount, London; M. C. Blunt, Hyde-park; G. L. Bright, East Dulwich; S. G. Carnell, Rushton; D. Dalton, H. Carman, West Dulwich; A. S. Dartwright, Crewe; G. A. R. Chamberlain, Malvern; W. Clark, London; H. Collins, London; L. N. Crowther, Clapham Common, S.W.; W.

Denton, Wadsley Bridge; *C. G. Eve, Bedford; H. C. Farmer, London; J. H. Furned, Middleton Stoney, Leicester; H. A. Glover, London; J. N. Grierson, Cheshunt; W. E. L. Jenkinson, London; E. J. Jones, London; W. T. Lamprell, Stratford; E. B. B. Newton, Rochdale; C. Osenton, Croydon; S. H. Patch, Addiscombe; O. B. Pearce, Nuneaton; P. Peebles, Albury, near Guildford; C. H. Price, Camden-square; J. Richardson, jun., Stamford; T. R. Robinson, Kensington; J. T. Rook, Carlisle; C. H. Russell, West Kensington Park; H. Shearburn, Godalming; A. C. Skingle, Brixton; S. Skimshire, Paddington; J. T. Sly, Forest Gate; A. C. Standen, South Kensington; L. H. Strouts, St. Mary Cray; B. Swanwick, Leek Woolton; *W. P. Theakston, Huntingdon; J. M. Theobald, Isleworth; W. Townsend, Searcroft, near Leeds; H. B. Vinten, Ramsgate; S. G. Wheatley, London; L. R. Wilson, Manchester; R. S. Woolf, Lowther, Penrith.

The following candidates have passed the direct Fellowship Examination in Division V:—

A. P. L. Cottrell, Bristol; J. H. Fry, Willesden; W. M. Kerrison, Douglas, Isle of Man; J. A. Maxwell, Banbury; A. F. Reid, London; J. S. Rowland, Burton-upon-Trent; S. P. Stewart, Arbury, Nuneaton; E. T. Tutt, Lewisham.

Twenty-five other candidates in the different divisions are referred back to their studies in their typical subjects.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY:

ANNUAL DINNER.

THE annual dinner of this Society was held on Thursday last week at Frascati's Restaurant, Oxford-street, the President, Mr. H. Coward, C.E., occupying the chair, supported by Captain Cecil Johnson, K.N., Professor Lobley, Messrs. B. Baines, Dudley and W. Cooper Penn (Vice-Presidents), C. E. Cassal, C. B. Goring, Holroyd Smith, W. Noble Twelvevees, A. T. Walmisley, Percy Field (Hon. Secretary), and others.

The loyal toast having been honoured, Mr. H. Ellis Hill proposed the "Army, Navy, and Auxiliary Forces," coupled with the name of Captain Johnson, who responded.

Mr. C. E. Cassal then gave the toast of the evening, "The Civil and Mechanical Engineers' Society." He said that the Society was one of the oldest societies concerned in the development of engineering work, having been founded in 1850. The Society met at frequent intervals to discuss matters of professional and scientific interest, and it succeeded in accomplishing, in a quiet way, a very good and valuable work. Engineers and scientific chemists often met in carrying out professional works for public bodies, and it had often struck him that there ought to be some understanding between them in order that the mistakes which members of both professions were liable to make might be avoided.

The President-elect, Mr. B. Baines, Dudley, in reply, said they were celebrating that night the 30th anniversary of the existence of the Society. The Society was founded for the purpose of discussing scientific subjects having special reference to engineering, and (he spoke from fifteen years' membership) that object had been worthily carried out. The papers which had been read before them were generally acknowledged to have been of great use to civil, mechanical, electrical, sanitary, gas, and water engineers. The work of the Society had been carried on without any endowment or reserve fund, and it had depended entirely upon the subscriptions of members. What they aimed at was the promotion of sociability at their meetings. This was absent in large societies, where most members were strangers to each other; and in his opinion the success of their society was largely due to their aim in this direction. But they desired to put their society in a better position, and an object they had in view was to obtain suitable offices of their own, where their meetings could be held. At present they were meeting at different hotels; but what they desired to do was to obtain suitable accommodation of their own, where they could house their library, and where their members could meet.

Mr. A. T. Walmisley, in giving the toast of "Kindred Societies," said that there was no scientific society which had not some connexion with engineering. As to their Society, at the time it was started the Institution of Civil Engineers was essentially an institution for civil engineers, but since then that Institution had, as their Society had from the first,

combined other branches of engineering work with that of civil engineering.

Mr. Holroyd Smith having briefly replied, Mr. W. Cooper Penn proposed the toast of "The Press," coupled with the name of our representative, who responded.

Mr. W. A. Twelvevees then gave "American Engineering Institutions," coupled with the name of Mr. Charles B. Goring. In the course of his remarks he referred to the competition and rivalry between engineers and the engineering trades of the two countries. A little rivalry was a good thing sometimes, and if Americans were able to undersell us in our own markets, the fault was our own, and, perhaps, was due to too much outside control of engineering workshops—a state of things which was somewhat altering now, he hoped. It would be a great advantage when the British workman would think for himself instead of blindly following his leaders.

Mr. Goring, editor of the *Engineering Magazine*, replied. The other toasts were "The President," proposed by Mr. C. R. Lee, and "The Officers of the Society," proposed by Mr. Rowland G. Foote, and responded to by Mr. Percy Field.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. McKinnon Wood, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Hackney Vestry 6,270l. for additions to the Vestry Hall and offices; the Hampstead Vestry 3,025l. for public convenience and for wood paving; the St. Olave's Guardian Board 18,000l. for the erection of Board-room and offices; and the Metropolitan Asylums Board 78,023l. for purchase of land and erection of buildings.

Tramways.—The Highways Committee reported as to the purchase of tramways of the London Tramways Company dealing with a portion of the South London lines, extending from St. George's in the Borough to the Horns at Kennington, and from St. George's to the Bricklayer's Arms. This Mr. Benn, the Chairman of the Committee, explained was practically the heart of the company's system, and as nearly the whole of the remainder of this company's section would fall in within three months the company was prepared to negotiate for the whole purchase. The Committee recommended: "That the Highways Committee be authorised to consider and advise the Council on any proposals which may be made by the London Tramways Company with reference to the portion of the company's system to be transferred on June 30, 1898, to the Council under Sir F. J. Bramwell's award; but that in view of the possibility of any proposals made by the Company not being such as the Committee can advise the Council to accept, the Committee be also authorised to make all necessary arrangements for the working by the Council itself, after the date named, of the portion above referred to of the Company's system, and for the purchase of cars, horses, and equipments, and the provision of such additional stabling accommodation as may be necessary; provided that no liability be incurred until an estimate should be submitted by the Finance Committee." This was agreed to with this rider, proposed by the Earl of Onslow: "The Committee do report to the Council the nature of such proposals, with their reasons for not advising the Council to accept them, and what further steps they recommend the Council to take with a view to the working of the portion to be transferred with advantage to the Council and without inconvenience to the public."

The Telephone Question.—On the reception of a report of the Highways Committee recommending the Council to inform the National Telephone Company that the Council's consent to the breaking up the streets would be withheld until reasonable terms had been secured from the company,

Mr. J. W. Benn said that last year the company sent in a sketch showing what they proposed to do for London. The Committee, having examined the proposals, proceeded to arrange preliminary conditions in order that the rights of the Council respecting the streets of London might be amply protected. After the Council had given their consent to these conditions, but before they were sealed, the committee discovered that Manchester, Liverpool, and other provincial cities had secured much better terms

than those laid down in the Council's conditions. As the agreement had not been sealed, the committee then tried to make better arrangements, which should approximate more closely to those obtained by the provincial centres. He thought it a monstrous thing that the London subscriber should be charged 20*l.* while the Manchester subscriber could get the same accommodation for 10*l.* The Highways Committee had suggested to the company that 12*l.* 10*s.* would be a reasonable charge. The Council had offered to surrender all claims to a rent for the use of the streets or of transformer boxes, although a rental of 10*s.* was paid in Manchester for each transformer box and 5*s.* for each subscriber on the company's books. The company had refused all the conditions.

The report was agreed to.

The Building Act: Devolution of Powers.—The Local Government and Taxation Committee submitted a lengthy report dealing with the recommendations for the devolution of certain powers from the Council to the Local Authorities, which were formulated by the conference held in January, 1896.

The consideration of the report was deferred, but we are able to give the following proposals relating to the Building Act:—

I.—The Conference proposed: "That the powers of the Council to remove posts and obstructions under section 109 of the London Building Act, 1894, should be transferred to the Local Authorities." We think that this is a matter with which the Local Authorities are quite competent to deal, and which may very well be left to them. We recommend:—(a) That the powers of the Council to remove posts and obstructions under section 109 of the London Building Act, 1894, be transferred to the local authorities.

II.—The Conference proposed: "That the power of sanctioning or of refusing sanction to the formation of new streets should rest in the first instance with the Local Authorities, it being left to the Council to confirm or reject the decision." We have carefully considered this matter and are of opinion that there is no objection to the Local Authority having the power asked for. We recommend:—(b) That the power of sanctioning or of refusing sanction to the formation of new streets, rests in the first instance with the Local Authorities, it being left to the Council to confirm or reject the decision.

III.—The Conference proposed: "That the powers relating to the appointment of District Surveyors, with the exception of the power of making by-laws for their guidance, should be transferred to the Local Authorities." The motion as originally proposed required the transfer of the by-law powers as well as the appointment of district surveyors, but an amendment was moved and carried for leaving the by-law powers to the Council. We would call attention to the fact that the resolution of the Conference is to transfer the appointment and not the duties of District Surveyors, though the arguments used at the Conference leave it somewhat doubtful whether it was the appointment or the powers of the District Surveyors which were desired. It appears by the shorthand notes that the question of the necessity for largely altering the existing Building Act areas was hardly discussed, and that it was admitted that the present system secured both uniformity and economy. The subject was exhaustively discussed in the evidence before the Royal Commission and the weight of experienced opinion appeared then to be against any such change; the Sub-Committee, after full consideration, arrived at the same conclusion, and we therefore recommend:—(c) That the powers of the Council relating to the appointment of District Surveyors be not transferred to the Local Authorities. We would further point out that every District Surveyor has to make a return to the Council every month under Section 160 of the London Building Act, 1894. This return consists of three parts, the first gives a list of all building operations of which the District Surveyor has had notice, or which he has discovered; the second gives a list of all the works, &c., which are finished, with the fees chargeable; the third gives the fees actually received, and those which are irrecoverable. We understand that the vestries desire to have the first part of this return, and we are of opinion that it should be furnished to them. We propose to bring up the necessary recommendations when the time arrives.

IV.—The Conference proposed: "That the powers of the Council relating to the approval of plans of buildings, to which Part VI. of the Building Act is inapplicable or inappropriate, to consent to temporary buildings, permission for the erection of wooden structures, departures from rules as to open space, cubical contents, height of buildings, &c., should be transferred to the Local Authorities, with the exception of the power of making by-laws." We have considered these matters, and we concur with the Building Act Committee, and with our Sub-Committee, that by reason of the difference in practice which would ensue if such matters as the licensing of departures from the statutory rules were transferred, it is not expedient to take the

action proposed. We recommend:—(d) That only the powers under Section 84 of the London Building Act, 1894, relating to the erection of wooden structures outside the City of London, be transferred to Local Authorities.

V.—The Conference proposed: "That the powers of the Council to refuse to sanction plans of working-class dwellings where sufficient open space is not provided about such buildings, should be transferred to the Local Authorities." We think that, in the interest of uniformity in so vital a matter, this power ought to remain with the Central Authority. We recommend:—(e) That the powers of the Council to refuse to sanction plans of working-class dwellings where sufficient open space is not provided about such buildings be not transferred to the Local Authorities.

VI.—The Conference proposed: "That the powers of the Council to take action where it is certified to the Council that a structure is in a dangerous state, or where a structure is neglected, and, with a Magistrate's order, to repair or demolish these, and charge the cost to the owner, should be transferred to the Local Authorities. We see no reason why the Local Authority should not have these powers. We recommend:—(f) That the powers of the Council to take action where it is certified to the Council that a structure is in a dangerous state, or where a structure is neglected, and, with a Magistrate's order, to repair or demolish these, and charge the cost to the owner, be transferred to the Local Authorities.

VII.—The Conference proposed: "That the powers of the Council to consent to balconies, &c., and other projections beyond the specified distance, should be transferred to the Local Authorities." We think that owing to the complications that might arise, as is explained in the evidence, of the officers and of the Local Authorities, it is undesirable to transfer this power, but we ought to point out that the Local Authorities are already consulted in these matters. We recommend:—(g) That the powers of the Council to consent to balconies, &c., and other projections beyond the specified distance be not transferred to the Local Authorities.

VIII.—The Conference proposed: "That the powers of the Council to remove unauthorised signs, on getting Magistrate's order, should be transferred to the Local Authorities." We see no objection to this transfer, but we think the Council should have power, as in other like matters, to act in default. We recommend:—(h) That the powers of the Council to remove unauthorised signs, on getting a Magistrate's order, be transferred to the Local Authorities, but that power be given to the Council to act in default of the Local Authorities.

IX.—The Conference proposed: "That the powers of the Council in regard to the storage of wood and timber under sections 197 and 200 (11*h*) of the London Building Act, 1894, should be transferred to the Local Authorities." (This will include the transfer of the penalty clause of the Act also.) "That the powers contained in section 170 of the London Building Act, 1894, with respect to the demolition of buildings erected in contravention of that Act, should be exercisable by the Local Authority in like manner as by the Council." We are advised that, with regard to section 197, it would appear that a Local Authority could now, if it thought fit, proceed for offences against that section, but that with respect to section 170 a Local Authority could not (except in the case of buildings and structures beyond the general line) act under that section, inasmuch as the section, in terms, only gives the Council power to serve the notice on which proceedings are based. We think that the Local Authorities should have concurrently with the Council in regard to storing wood and timber and in regard to the demolition of buildings erected in contravention of the Act, but that the powers of the Local Authorities should be limited under the latter section to cases where they have obtained the convictions upon which demolition proceedings are based. We recommend:—(i) That powers be given to the Local Authorities concurrently with the Council to take proceedings with regard to the storing of wood and timber under Sections 197 and 200 (11*h*) of the London Building Act, 1894, and in regard to the demolition of buildings erected in contravention of the Act, under Section 170 subject to the powers of the Local Authorities being limited under the latter section to cases where they have obtained the convictions upon which demolition proceedings are based."

Waterloo Bridge.—The Bridges Committee reported as follows, the recommendation being agreed to:—

"In January, 1892, the Council gave directions for the tops of two and a half arches, carrying part of the southern approach to Waterloo Bridge, which was constructed in the year 1817, to be apportioned to prevent the leakage of water into the archways, at a cost of about 1,000*l.* Since that time we have received complaints from the occupiers of the remainder of the arches, forty-five and a half in number, of the percolation of water, which has not only seriously damaged the goods stored therein, but has acted injuriously on the structure of the arches. The total number of vaults under the approach road is forty-eight, nine being held on a lease for ninety-nine years at a peppercorn rent, which expires at Midsummer, 1921, when a rent of 200*l.* will be paid for the same; two vaults under

the approach connected with the 'Feathers' public-house is held on a yearly tenancy of 20*l.*, and thirty-seven vaults are held on a lease of ninety-nine years, which expires at Midsummer, 1924, at an annual rent of 390*l.*, making in all a gross rent of 410*l.* per annum. The engineer reports that the water has caused damage to the brickwork of the arches, which have been built with only lime mortar and a protective layer of clay puddle. The complaints of the tenants have been many and frequent, and in consequence of the opening, which have been made in the approach road, the paving and the layer of protective clay puddle have been much damaged. Annoyance has also been caused to the public by the frequent interference with the traffic through the openings which have been made from time to time in the road. The difficulties experienced in fixing the responsibility for the leakage and of recovering the cost of making the openings have been great. Two water companies have mains in the approach, the householders own the connecting pipes, while the Local Authorities control the sewers and defects in any of these may cause the leakage. Litigation has also been threatened both by the occupiers and the Local Authorities. We think, therefore, the Council should take measures for putting an end to the cause of the difficulties, as we are advised that the duty of supporting the road devolves upon the Council. Various steps have been taken, but they have proved ineffectual, and the engineer has informed us that the only course to be taken to prevent the deterioration of the arches by water is to carry out similar work to that which has been already carried out on the two and a half arches previously referred to, and which has proved effectual, viz., to cover the arches with a continuous layer of asphalt, 1 in. in thickness, with 12 in. of Portland cement concrete, the water being conducted to an iron drain pipe built into the centre of the spandril and brick pier of each arch, and each of the drain pipes connected with the local sewer near the foundations of the piers, provision being made for the water, gas, and hydraulic mains of the several companies being carried on concrete spandrils. The estimated cost of the work, including the reinstating of the carriage-way and footway paving, and a length of about 33 ft. of carriage-way, spanning Belvedere-road, is 11,700*l.*, which has been provided for in the maintenance estimates for this year. With regard to the carrying out of the work, we have come to the conclusion that the best course for the Council to take is to invite tenders, the prices in which will form a schedule for the work, and with that object we recommend:—That the work in connexion with the repairing of the tops of the arches in the southern approach to Waterloo Bridge be carried out in the manner above-mentioned for the purpose of preventing leakage therein, at an estimated cost of 11,700*l.*, and that the Bridges Committee be authorised to invite tenders for the work."

The Council adjourned soon after 7 o'clock.

COMPETITIONS.

GAOL, BERWICK.—At a meeting of Berwick Town Council recently, it was stated that thirty architects had submitted plans for the new gaol at Berwick, and that five had been selected, viz.—Messrs. R. Burns Dick, Newcastle; Charles Frederick Short, London; Stephen Piper, Newcastle; Fitch & Triggs, London; Charles T. Marshall, Newcastle. The estimated cost varied from 3,500*l.* to 5,000*l.* The plans of Mr. Dick have been selected.

PROPOSED MUNICIPAL BUILDINGS, GODALMING.—The Town Council have determined to invite the following architects to submit designs for the proposed municipal buildings for Godalming:—Messrs. Ardrow & Dawson, Westminster; Mr. Charles Bell, London; Messrs. Colson, Farrow & Nisbet, Winchester and London; Mr. John Johnson, London; Messrs. Lanchester, Stewart & Rickards, London; Mr. Henry Moon, Godalming; Mr. E. R. Robson, Westminster; Mr. J. W. Stevens, London; Mr. A. H. Tiltman, London; Mr. A. H. Verstage, Godalming; Mr. Samuel Welman, Godalming; and Messrs. Woodhouse & Willoughby, Manchester. Mr. E. W. Mountford has been appointed assessor.

SWIMMING BATHS, ROMFORD.—The Urban District Council of Romford having decided to erect Public Swimming Baths in Mawneys-road, Romford, invited designs from architects, and have selected for execution the design submitted by Messrs. Harrington & Ley, of 108, Fenchurch-street, E.C.

TOWN HALL, TAUNTON.—The result of the competition for a Town Hall at Taunton has just been made known. The first premium has been awarded to Messrs. Samson & Cottam, Taunton; the second to Mr. J. M. Brydon; and the third to Mr. H. T. Hare. Mr. Mountford was the assessor.

Correspondence.

To the Editor of THE BUILDER.

WALTHAM ABBEY.

SIR,—Your serial history and the beautiful drawings of Mr. Rowland Paul in the *Builder* for April 2, 1898, have revived once more the ever recurring debate as to the date and style of this most interesting church—or, rather, part of a church. In 1896, the Council of the British Archaeological Association honoured me with the request that I should conduct one of their Congress meetings over the remains of this once very extensive building. At that time I was not a stranger to the church referred to, but in preparation for that meeting I went to Waltham Abbey and stayed there for some days and worked each day early and late in the study of the remains and in making drawings and measurements of its details. This resulted in the production of a paper which was read at the meeting held at the church. In the journal of the Association for last year this paper and some illustrations were published. That paper concludes with the following words:—"What, in my humble view, is significant, is the fact that not a single particle of Saxon design or workmanship is present in the building, except possibly a fragment in the lower part of the Eastern face of the south transept west wall, and the small quantity of external rubble facing in the south aisle. But, on the other hand, the design, the workmanship, and the ornamentation are all Norman, and in all probability Norman oversight controlled the work." Stronger expressions on this point might have been made use of; in fact it might almost as well be asked whether the building is Greek or Saxon. It is known now, without a doubt, that the characteristics of Saxon architecture are as forcibly marked as are those of every other well-defined style. And in my view no one with practical knowledge on the subject of Saxon detail or design will venture to say that there is a single trace of distinctive Saxon detail in this building. On the other hand, every one who has studied without, and unfluenced by what historians have said about Harold building a church at Waltham, must admit that the church (speaking broadly) is Norman in conception, in design, and in execution from base to summit.

Mr. J. Arthur Reeve had the best of opportunities for the most detailed study of the building, and his paper thereon in respect of certain details has assuredly to be reckoned with; but it would seem almost that the influence of details on his mind, as recorded by him, has led him away, in his apparent anxiety to find at least some of Harold's work, from the greater generalities of the fabric. Take but a single instance which is named in my paper before referred to. "The bays of the nave arcades are not treated as a repeat of a single bay, but are grouped into pairs, with a main and a minor pier to each pair, and each main pier has a semi-shaft next the nave running from floor to roof; but the corresponding shaft over the smaller piers starts at the

the body of the church are just about half the thickness of the inner walls.

It is most improbable, therefore, that these walls are of the same date, or that they came from the hands of the same workmen—the one are of the usual thickness of Norman walls, the other of that thickness peculiar to an earlier type of work.

At Waltham Abbey, the evidence of these outer walls being Saxon is pretty conclusive, for the whole story may be read in the wall at the end of the present south aisle, which is the west wall of the ancient south transept.

On its eastern face, which originally formed the inner face of the wall, you may see the Saxon work up to the first string course, with the slanting or herring-bone fashion of laying the stonework peculiar to that type or period. The string course is Norman, and all the walling above it, and very strange the window looks in so thin a wall.

Outside, the Norman builders apparently refaced the walls and added pilaster buttresses to them.

At Waltham Abbey, the walls of the transepts are equally of the thin-walled type. At Carlisle they are of the normal thickness of Norman walls, as were also the walls of the eastern apses discovered in 1892, which showed a very northern type of walling.

At Waltham we have, apparently, in the lower portions of these outer walls, the actual work of Harold, and though I agree with Mr. Reeve that the western arches of the nave are earlier than the two eastern ones, the one showing a concrete soffit and the other Norman stone encasement to the inner order of the arches, I cannot think that walls of this type and character were in use in England at so early a date.

It appears to me to follow that the Norman builders restored the outer walls of Earl Harold's church of Waltham Abbey with additions and ornamentation of their own type, and that they entirely rebuilt the walls of the nave arcade; a very natural course for them to adopt, inasmuch as the division between the nave and aisle of a Saxon church was in the nature of narrow arches pierced in a continuous wall rather than an arcade.

At Carlisle, the transepts with their apsidal chapels are clearly Norman work from the bottom of the narrow outer walls of the nave follow them exactly in being decked out with similar details.

At Waltham, marks of the groining of the aisles are apparently visible.

At Carlisle, although the outer walls were provided with shafts to receive arches, it is clear that none were attempted.

It has been suggested that churches of the size of Waltham or Carlisle were unknown in Saxon times, but the admirable paper of Mr. Micklethwaite's on Saxon Churches, recently published in the *Transactions of the Archaeological Journal*, and the plans which illustrate it, go far to disprove this assertion; and I have therefore added in a foot-note a comparison of the principal dimensions of Waltham Abbey and Carlisle with those of the Saxon churches of York and Peterborough given in Mr. Micklethwaite's paper.

CHARLES J. FERGUSON, F.S.A.

Norman architecture was more developed in Normandy before the Conquest than it was in England after the Conquest. I doubt whether this opinion can be maintained, for it is undoubtedly in the earliest works in England after the Conquest that we find the closest similarity to contemporary work in Normandy; e.g., the chapel in the tower of London, the remains of Remigius' work at Lincoln, the nave of Blyth Church, Notts, and the chapel in Durham Castle. It is natural enough that it should be so, seeing that the buildings in both countries were erected by the same men.

If we are to believe that the western bays of Waltham are Harold's work, we must hold that after the Conquest Norman builders, both in Normandy and England, deliberately ignored this astonishingly advanced work, and persisted in the far ruder and less developed manner in which they had hitherto been working; and that it was only after some fifty years of gradual development that they reached the precise stage at which Harold's builders had arrived in 1062. And we must believe this in spite of the fact that the half-century in question covers the earlier part of the most active period of church-building which our country has ever seen, a period, too, during which the majority of our great churches were being either built or rebuilt.

JOHN BILSON.

SIR,—I am much obliged to Mr. Reeve for the information in his letter in your issue of May 7. I was acquainted with the measured drawings, and with the breaks of design in the nave. I did not enter into the question of the chronology of the eastern and western portions of the nave; because I hold that whichever was the earlier portion, it was not built before the twelfth century. I may say that far too much importance has been attached by archaeologists to small breaks in design.

Mr. Reeve practically concedes that Waltham is more advanced in style than any building in England of the eleventh century. He implies that it is not, however, more advanced than the eleventh century work of Normandy. The very reverse is the case. Look at the characteristic work of the eleventh century at Bernay, Jumieges, Gravelle, St. Nicholas Caen, and the Abbaye-aux-hommes; the Ionic caps, the square-edged arches, the simple clearstories; you will find nothing so advanced as Waltham.

So that we are driven to conclude, first, that Harold's architect borrowed from Normandy a design superior to anything existing in Normandy; and, secondly, that this superior design existed unnoticed, unadmired, uncopied, at Waltham for nearly forty years, till it was caught up at Durham. Whereas we know that in those days an architectural fashion passed from city to city as rapidly as nowadays the latest thing in mantles and bonnets.

I find that M. Ruprich-Robert says that Waltham is neither Saxon nor of the date 1062; but that it resembles in style the buildings erected towards 1130.

FRANCIS BOND.

THE NAVE AND AISLES.

TRANSEPTS.

	External Walls.	Arcade Walls.	Width of Aisles.	Width of Nave.	Width Between Walls.	Length of One Bay, Centre to Centre.	Total Length.	Width.	Walls.
Waltham Abbey	Under 3 ft.	About 5 ft.	10 0	25 0	55 0	15 0	98 0	27 0	Under 3 ft.
Carlisle	Under 3 ft.	Over 5 ft.	15 0	22 6	63 0	17 0	113 0	21 0	Over 6 ft. 6 in.
Peterborough	Under 3 ft.	About 3 ft.	11 0	31 0	61 0	17 6	100 0	33 0	Under 3 ft.
York	—	—	15 0	33 0	68 0	17 6	117 0	29 0	A little over 3 ft.

These figures are approximate only.

level of the sill rising to the triforium story." This general design of plan and elevation for the whole of the nave would seem to determine the unity of design of the whole existing building, and other points of the same import might be mentioned. As to the various dates in Norman times, when different parts were completed, that does not, of course, touch the question as between Saxon and Norman style.

Except for the historical record before mentioned, it is hard to conceive that any one could hesitate on the subject of the style of the building. But the record is a historical difficulty, and not an architectural one, and may, from the point of view of style of architecture, be left to the learned historians to clear up. If the measured drawings of Mr. J. Arthur Reeve, deposited in the library of the R.I.B.A., could be published, much information would be gained.

C. LYNAM.

SIR,—The correspondence in your columns about Waltham Abbey, especially the interesting letter of Mr. Reeve, induces me to ask your permission to bring forward the plan of the monastic church of Carlisle as being curiously like to that of Waltham in one particular.

They are alike singular in that the outer walls of

SIR,—I have no desire to take part in a renewal of the controversy as to the date of the nave of Waltham Abbey, but I should like to make one or two remarks on the general questions raised in the letter from Mr. J. Arthur Reeve which appeared in your issue of the 7th inst.

Mr. Reeve suggests that Harold was so much impressed with the buildings which he saw in Normandy that he brought them over to England from the Continent to carry out his new works at Waltham Abbey. If this were so, these men must, indeed, have been remarkable, for at Waltham they must have anticipated the manner of building which only prevailed in their own country some half century after Harold's time. There is nothing in the buildings in Normandy known to be of Harold's time which affords the least support for the theory that he built the western bays of the nave of Waltham. The date of 1062 for this work is almost as impossible in Normandy as in England. The scaled capital is not to be found in Normandy buildings erected before the end of the eleventh century. The subdivision of the capitals of the great circular piers to receive the arch orders, and the prevalence of the chevron ornament in the arches at Waltham alike point to the twelfth century rather than the eleventh. Mr. Reeve considers that the Abbaye aux Hommes at Caen is a standing proof of the fact that

. We may mention that in the last sentence of Mr. Reeve's letter in our issue of May 7, the word printed "arguing" should have been "agreeing." The proof was returned too late for correction.—ED.

WESTMINSTER BUILDING DISASTER.

SIR,—As I find that some misconception has arisen, may I beg the favour of your insertion of a note in your next report of this case, to the effect that I am in no way concerned with the buildings in question.

JOHN W. SIMPSON, A.R.I.B.A.,
10, New Inn, Strand, London, W.C.

NEW PIER, THE MUMBLES.—The new pier which has just been erected at the Mumbles, is built out from a point just inside the Inner Sound and under shelter of the Mumbles Head. The pier extends out into the sea about 850 ft., the width of the neck is 25 ft., there is a central widening 60 ft. long by 40 ft., on which there are shops, while the pier head forms a promenade 135 ft. long and 84 ft. wide. Here is erected a band-stand. Round this pierhead is a wooden landing-stage with landing-steps. The cost has been about 16,000*l.*, and the work has been carried out by the Widnes Foundry Company, from the designs of Mr. Sutcliffe Marsh, the engineer.

Illustrations.

ST. MARK'S, HARROGATE.

THIS church is being built on a site given by Mr. Paley. The surrounding property is rapidly being covered with good residences, and in time promises to become one of the most important parts of the town.

The nave and aisles are the only parts so far contracted for, but it is hoped that the chancel and the tower will follow before long. The contractor is Mr. Rudd, of Grantham. The present work will cost between 7,000l. and 8,000l.

The architect is Mr. J. Oldrid Scott. The drawing is exhibited at the Royal Academy.

"MIEFIELD," KIRKCUDBRIGHTSHIRE.

THIS house has been built for Mr. Walter Neilson, of Errenfield, Ayr, on a fine site on the edge of the moorland, a few miles north of the county town of Kirkcudbright, and is to be used as a shooting-box. It has been built of local brick and rough-cast, a very little dressed stone being used to emphasize the principal entrance, the drawing-room bay, and the two main gables. The roofs are covered with Elterwater green slates, with grey concrete ridges. The interior is entirely finished in timber, the hall, dining-room, and drawing-room being panelled to the tops of the doors. The hall forms the central point of the plan, and with the dining and drawing rooms opening out of it at opposite ends, forms a fine suite of rooms. A strong point has also been made of good and direct service to the dining-room, and of good servants' accommodation. Externally the house has been designed on a long plan, with one dominating roof-line, and has been treated in a distinctly Scottish manner, but with no exuberance in matters of detail. The view now reproduced shows the character of the surrounding country, and the endeavour has been made to make the house harmonise with its surroundings. The house is lighted by acetylene gas, which has been found very suitable, and very easily managed. A good gravitation water supply has been provided, and advantage has been taken of the considerable pressure obtained to fit up fire-hydrants at several points outside and inside the house. The works also included stabling and man's house, and the renovation of the farmstead. The contractors were: mason work, Messrs. A. R. & J. Lindsay, Dalbeattie; joiner work, Mr. D. Milligan, Ayr; slater, plumber, and rough cast work, Mr. J. C. Highet, Ayr; painter work, Mr. Brodie, Castle Douglas; and gaskmaking plant, Messrs. Read, Holliday, & Co., Glasgow. Messrs. Longden & Co.'s grates were used throughout the house.

JAS. KENNEDY HUNTER.

-BROOM HILL, OXSHOTT, SURREY.

THIS is an illustration of a house now in course of erection upon the crown of Broom Hill, Oxshott, Surrey, commanding a very fine view of the surrounding country. The foundations are now being put in, and the roads made by the owner.

The walls are built hollow, with local red brick facings and Portland stone dressings, and roofs covered with Broseley tiles. The windows are provided with double sets of casements as a protection against the exposed situation. The entrance is marked by the entire bay and gable being built with Portland stone ashlar.

The small sketch plan gives the general arrangement of the ground floor, and the aspect, the principal rooms looking south-west. The principal feature internally is the hall and staircase, which will be lined throughout with oak panelling, cornices, and beams; and all the principal rooms and staircase are approached direct from the hall.

F. G. KNIGHT.

SKETCHES IN CAEN AND NEIGHBOURHOOD.

THE Church of St. Etienne—the tower of which is shown in one of the sketches—is in the Rue de Chaumont, Caen. It is an elaborate fifteenth-century building in, unfortunately, a sadly neglected state, and used, not for religious purposes, but as a storehouse. There are, apparently, too many churches in Caen. The



The Coopers' Company Almshouses, East London. From a sketch by Mr. J. H. Coram.

oriel window is on the first floor of a house in the Rue de Chanoines, near to the church of La Trinité, of the Abbaye aux Dames. Heronville—two sketches of its church are given—is some few miles out of Caen. The church has been unfortunate enough to fall into the hands of the restorer, with the result that the whole of the nave has been restored, or, to be more correct, rebuilt with entirely new materials, not a trace of the old work being visible. The chancel and tower have so far escaped. The window shown in the sketch is in the chancel, its glass is in a neglected state; the masonry is of coarse construction and detail. The modern work of this church compares very badly with the old; the appearance of the old work has been, of course, greatly improved by the effect of the weather on the stone work. The tower has weathered to a particularly good colour. The old church of Notre Dame, Bretteville, is some few miles from Caen. The tower shown in the sketch is all that now remains; the nave, chancel, and any other portions there may have been have vanished, leaving the tower alone standing on little more than four legs of masonry. The ground level is now used as a shrine. The remaining sketch is of another village church in the vicinity of Caen; its name has been forgotten. As will be seen, the tower is in a state requiring repair.

J. H. CORAM.

THE COOPERS' COMPANY ALMSHOUSES.

IN the *Builder* for April 16 (page 367) we gave some account of this old building, which it is said is about to be demolished. Mr. J. H. Coram has kindly sent us the accompanying sketch of the building, which may be of interest as a record.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At a recent meeting of the London County Council, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Islington, North.—A one-story shop on part of the forecourt of No. 119, Stroud Green-road (Mr. F. L. Pither for Mr. P. Gardiner).—Consent.

Wandsworth.—Houses on the west side of St. Ann's Hill and The Grove (Mr. G. E. Withers for Messrs. Withers & Son).—Consent.

Marylebone, West.—Stone balconies on the first, second, third, fourth, and fifth floors in front of a block of residential flats known as Abbey-court, on the site of No. 47, Abbey-road, St. John's Wood (Messrs. Metcalf & Greig).—Consent.

St. George, Hanover-square.—Wood and glass enclosures of two verandahs erected at No. 28, Park-lane, and overhanging the public way in that street and Upper Grosvenor-street respectively (Messrs. S. J. Waring & Sons for Mr. S. J. Waring).—Consent.

Woolwich.—Bay windows to seventy-six houses proposed to be erected on the north and south sides of Wernbrook-street, Plumstead (Mr. J. O. Cook for Mr. J. Wernham).—Consent.

Chelsea.—That the consent of the Council of April 4, to the erection of a one-story shop upon part of the forecourt of No. 183, King's-road (Mr. J. E. Arpin for Mr. F. C. Woolmer) be modified by the

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

omission of the words "dedicated to and" from such consent.—Agreed.

Marylebone, East.—That no order be made with reference to the application of Mr. W. J. Miller on behalf of Mr. H. S. Schwarz, for consent to a porch at the entrance to Nos. 88 and 90, Great Titchfield-street.—Agreed.

Lambeth, North.—An iron and glass covered way in front of the Waterloo Hotel, York-road (Mr. G. K. Deakin for Messrs. Deakin & Son).—Refused.

Westminster.—A projecting shop-front to a house with shop on the west side of Rochester-row, at the corner of Emery-hill-street (Mr. J. S. Quilter for Mr. K. W. Hedges).—Refused.

Deviation from Certified Plans.

Strand.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of No. 29, Foubert's-place, Regent-street, St. James's (Messrs. Goodwyn & Sons, for the Lion Brewery Company).—Refused.

Holborn.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of a block of residential flats on the site of Nos. 33 and 33A, Red Lion-square, and No. 11, Old North-street (Mr. E. J. Stubbs for Messrs. T. Millman & Co.).—Refused.

Artisans' Dwellings.

Greenwich.—A modification of the provisions of Section 41 of the London Building Act, 1894, with regard to open spaces about buildings, so far as relates to the proposed erection of eight blocks of two-story buildings to be inhabited, or to be adapted to be inhabited, by persons of the working class on the south side of Old Woolwich-road, and that the plans submitted with the application of Mr. R. Plumbe for the Housing of the Working Classes Committee of the Council, be sanctioned.—Consent.

Lines of Frontage and Width of Way.

Hammersmith.—The re-building of the "White Hart" public house, Nos. 357 and 359, King-street West, to abut upon White Hart-court (Messrs. Wilson & Long).—Consent.

Havon.—An addition to workshops at No. 65, Cradall-street, St. John's-road, Shoreditch (Mr. F. Tupper White, for Mr. J. Biggs).—Refused.

Formation of Streets.

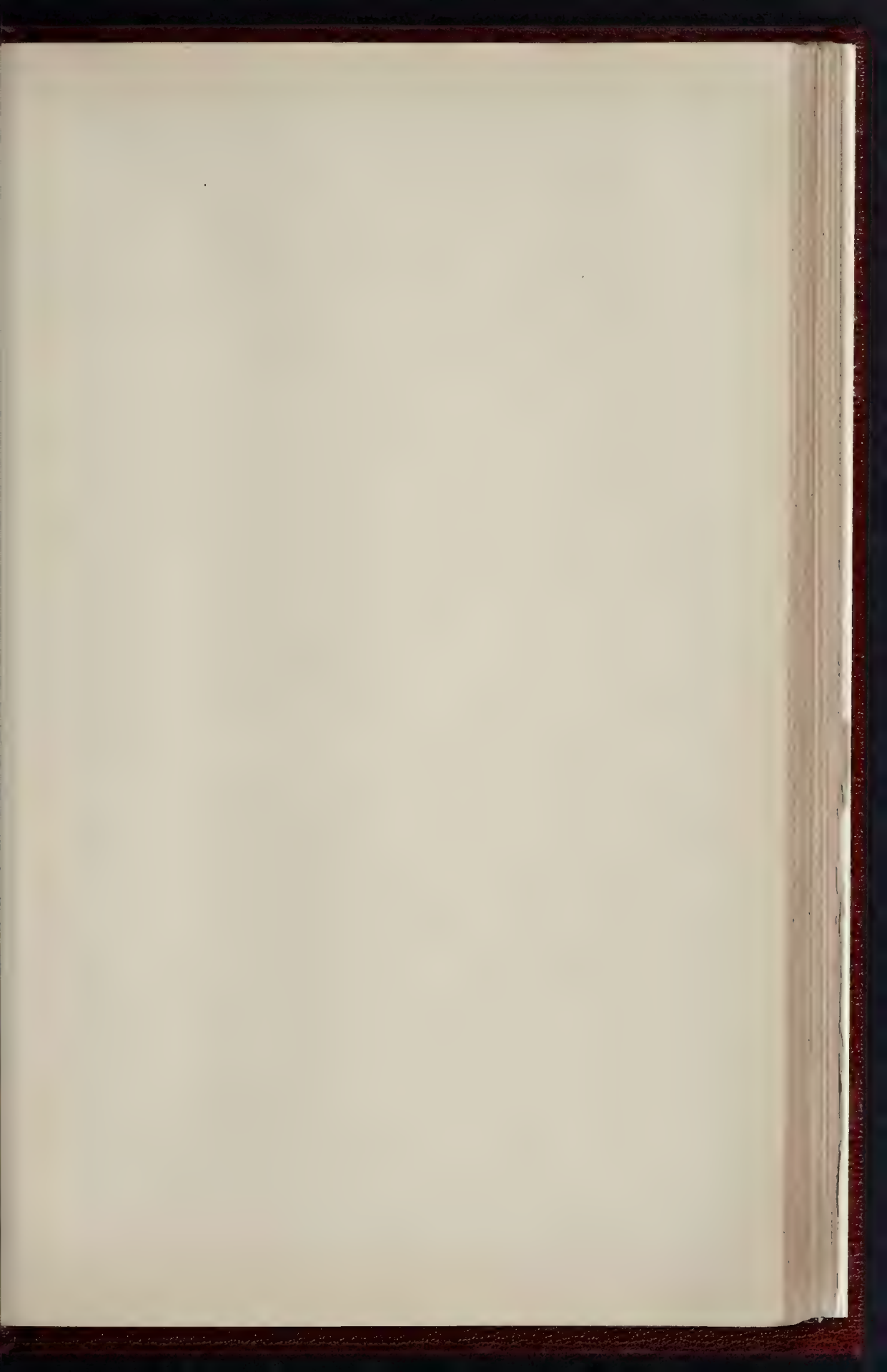
Woolwich.—That an order be issued to Messrs. Tapp & Jones sanctioning the formation or laying out of new streets, for carriage traffic, out of the north side of Elizabeth-street, North Woolwich. That the names Drew-road (in continuation), Fernhill-street (in continuation), and Silverland-street be approved for the new streets.—Agreed.

Wandsworth.—That an order be issued to Mr. A. G. Hastlow, refusing to sanction the formation or laying out, for carriage traffic, of a new street, 40 ft. wide, out of the north side of Lower Richmond-road (for Mr. C. Coward).—Agreed.

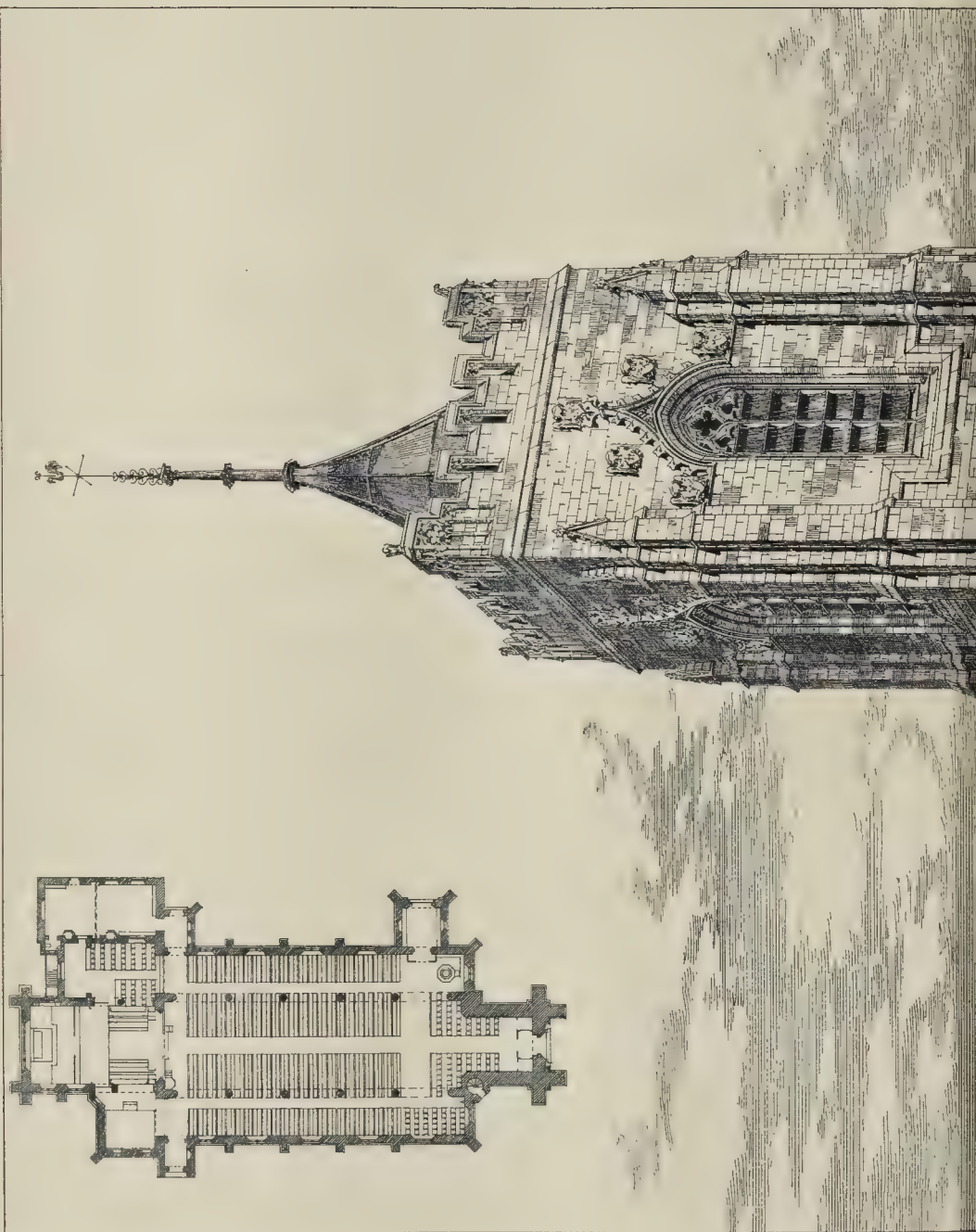
Means of Escape at Top of High Buildings.

Rotherhithe.—That Messrs. Stock, Page, & Stock be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is prepared to grant a certificate in respect of the means of escape, in case of fire, to be provided for the persons dwelling or employed on the top floor of a proposed addition to Messrs. Peek, Frean, & Co.'s biscuit factory, Drummond-road, Bermondsey.—Agreed.

SCREEN, EDWARD-STREET CONVENT, LURGAN.—The chapel attached to the Convent of the Sisters of Mercy, Lurgan, is being furnished with a screen. It divides the chapel into two divisions. The material used in its construction is pitch pine. The screen is the design of Mr. J. J. McDonnell, Belfast. The work is being executed by Mr. McNaughton, contractor, Randalstown.



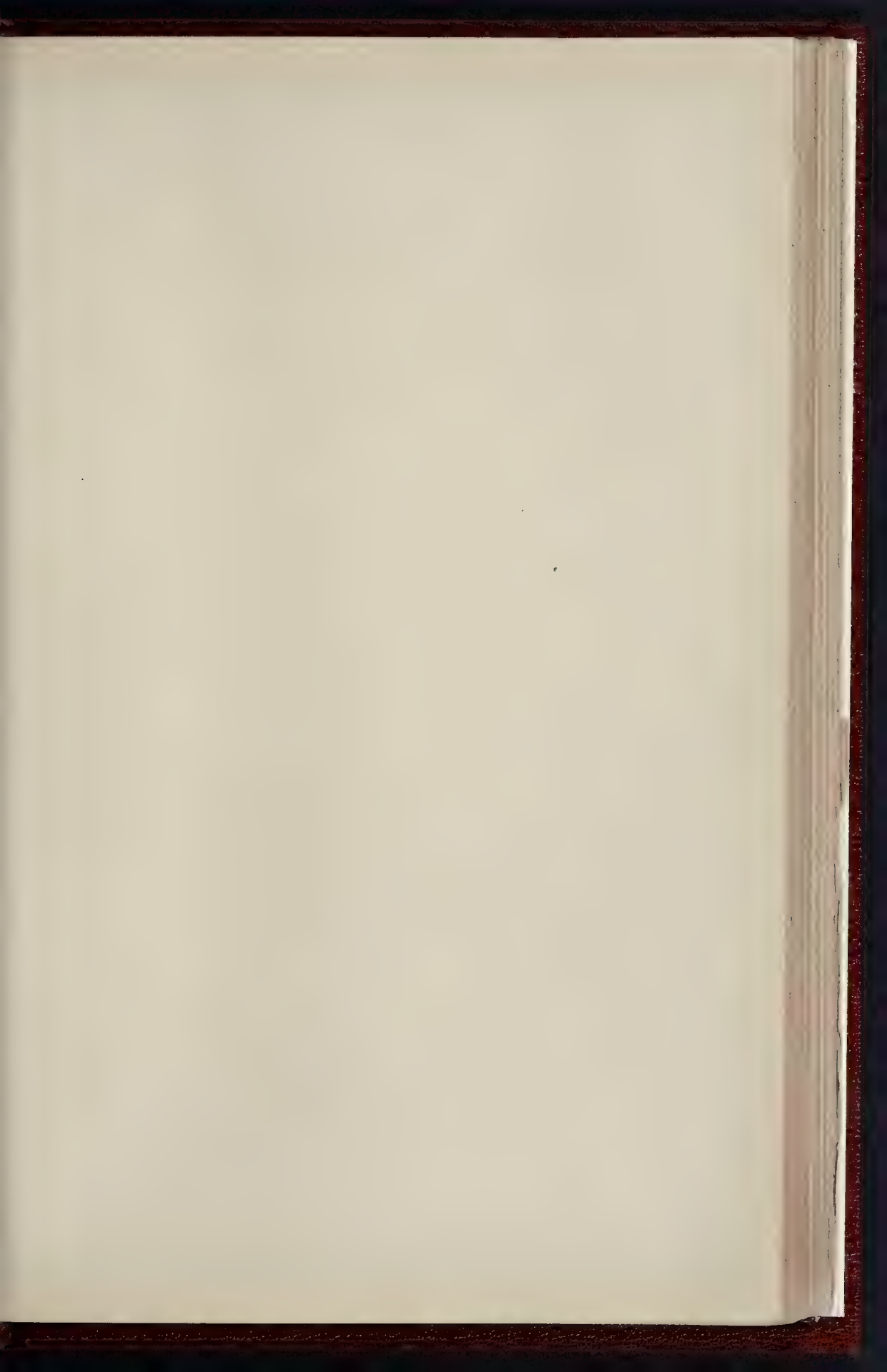
THE BUILDER, MAY 21, 1898.

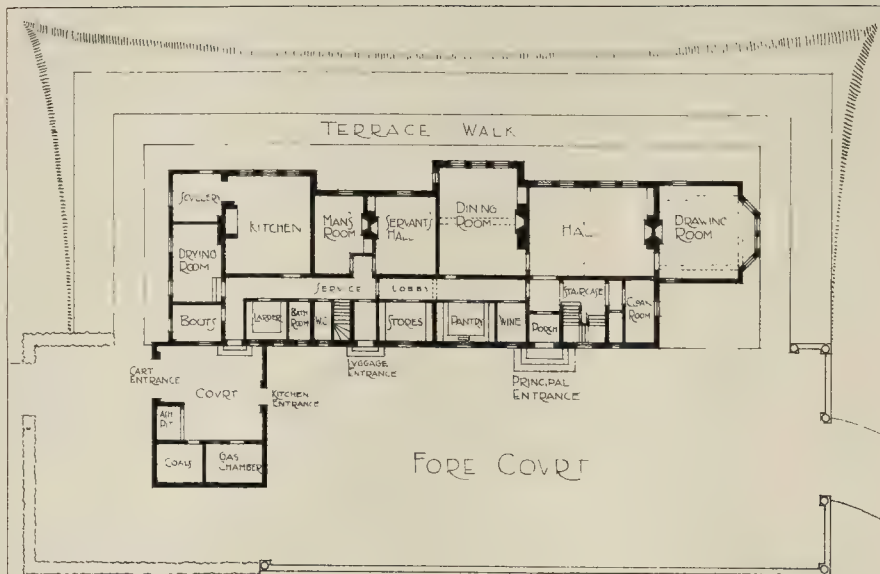




TOWER OF ST. MARK'S CHURCH, HARROGATE. E. J. OGDON SCULPTOR, PS. A. H. B. ROY.
35 SPRING GARDENS, LONDON.

FOR THE YEAR 1851. BY THE REV. J. H. B. ROY, M.A. HARROGATE. 1851.

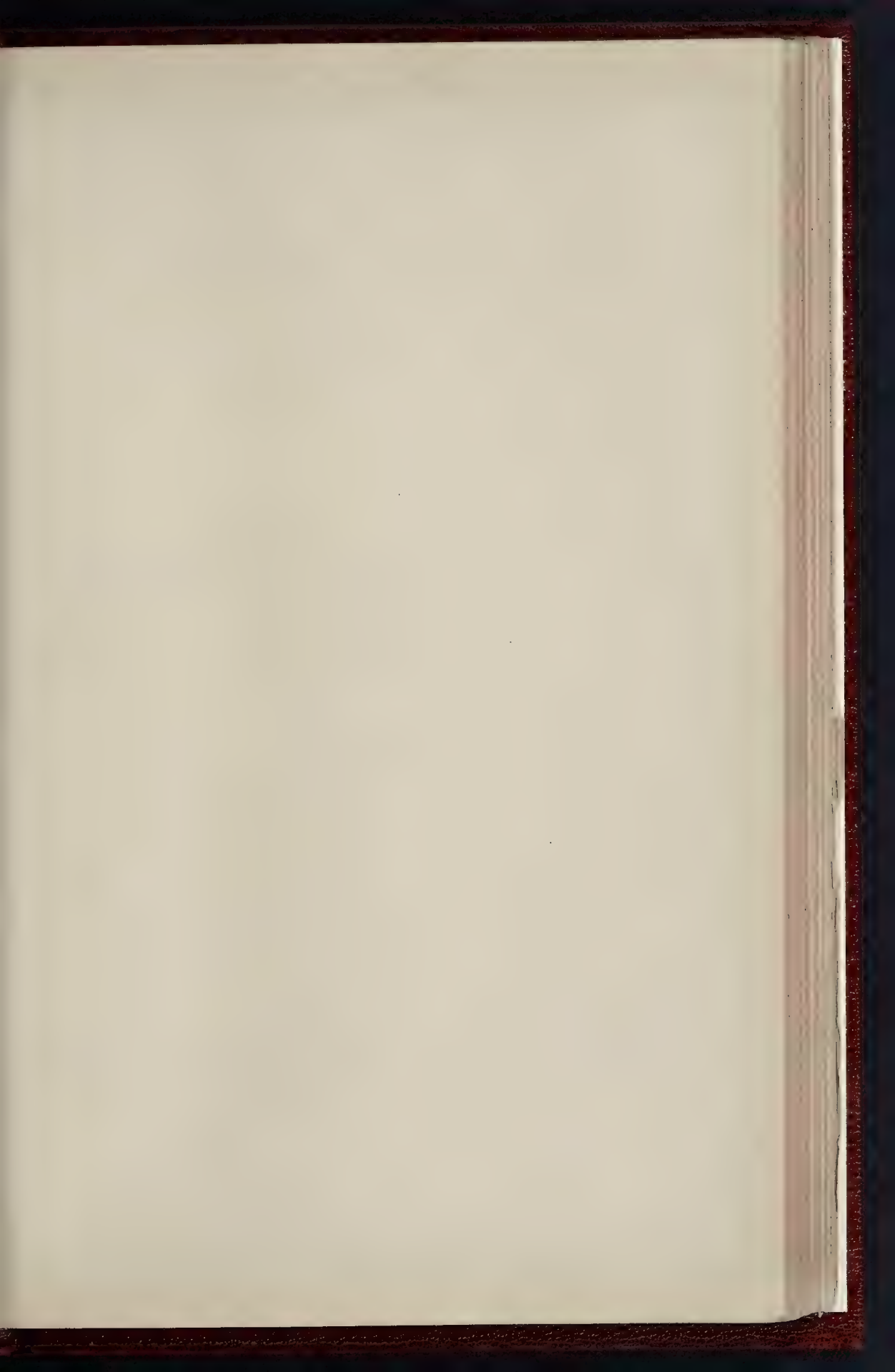




SHOOTING LODGE, MIEFIELD, KIRKCU



PHOTO LITHO SPRAGUE & CO. Lth 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.



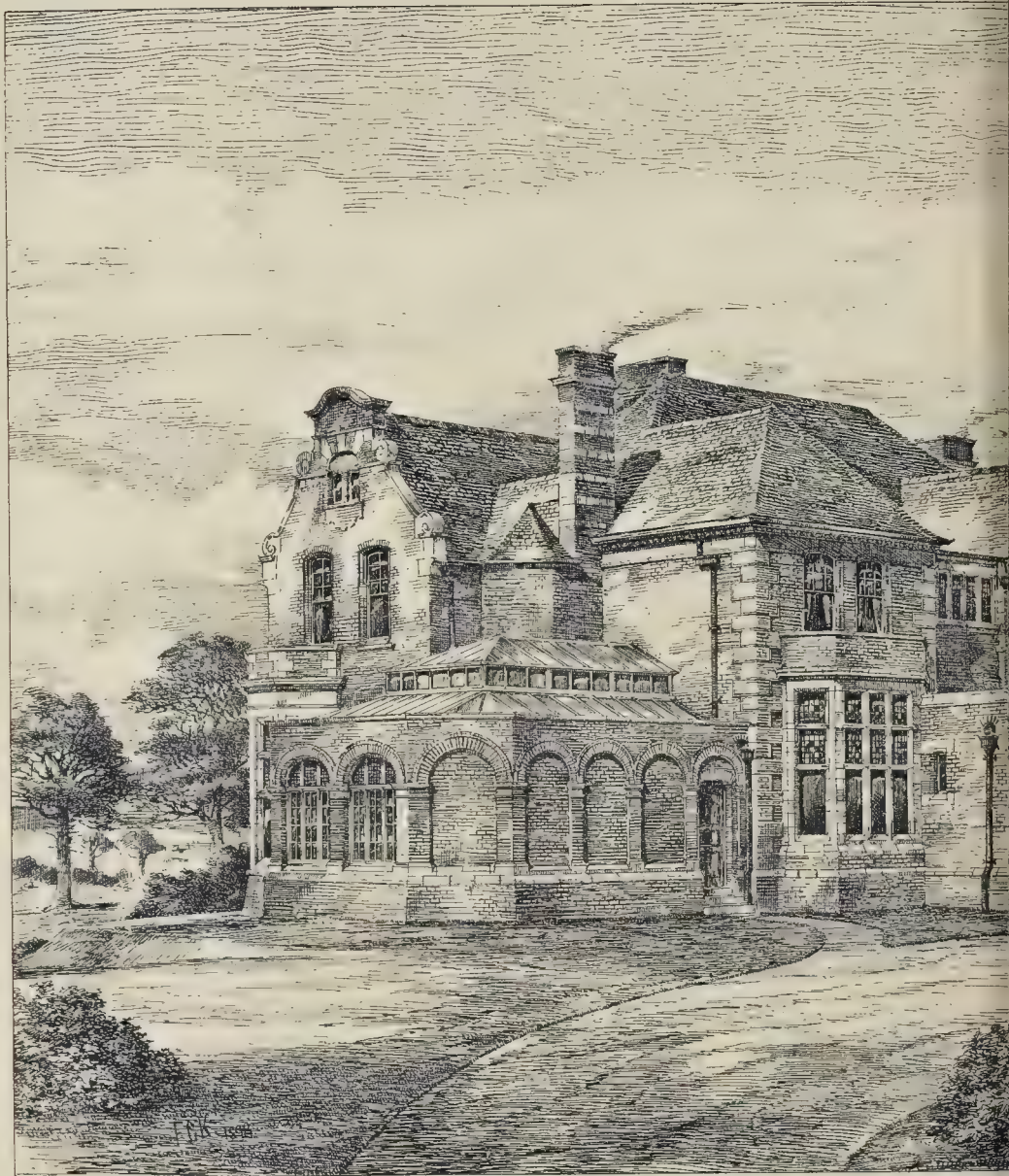
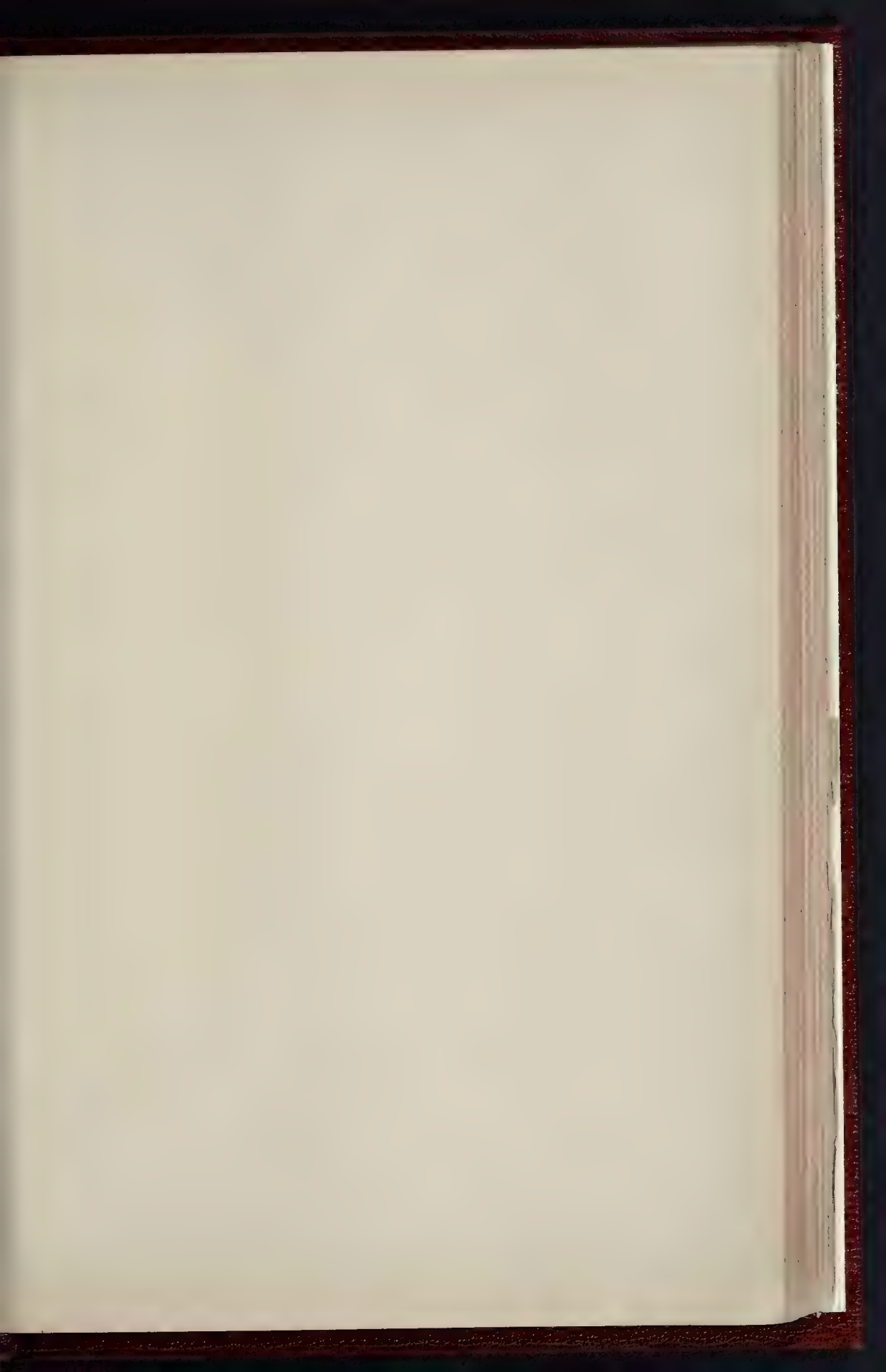


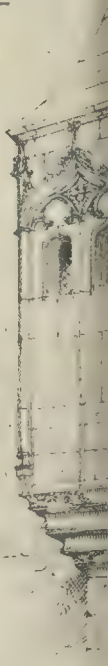


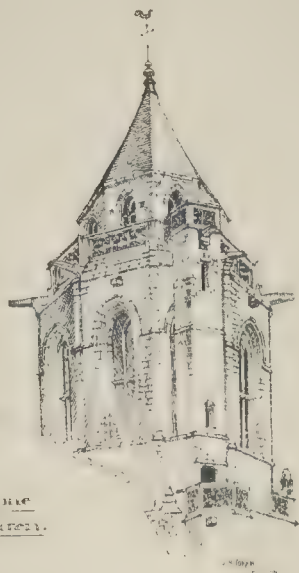
PHOTO LITHO SPRADJE & CO. 17 & 19 EAST HARDING STREET LUTTER LANE E.C.



Church at Hieronville.

Cren.

Old Church: Notre-Dame
Briekville. Cren.Window in Hieronville Church near Cren.Oriel, Rue-des-Chenottes.
Cren.

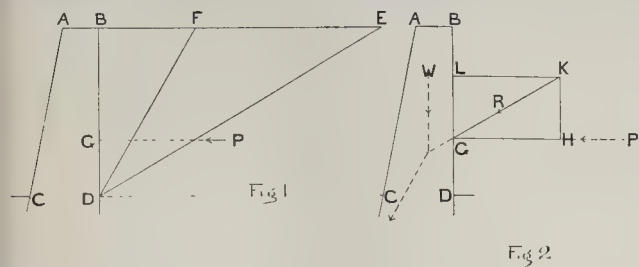


St. Etienne
Caen.



Village Church,
near Caen.





The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XXI.

THE first difficulty which we have to face in attempting to estimate the amount of the overturning force on the back of the retaining wall is the determination of the natural slope or angle of repose of the earth which is to be supported. When one has to deal with an actual case it is sometimes possible to make a bank of an experimental earth with the earth which is to be dealt with, and then by observation we can arrive at the natural slope of the earth in question. As a general rule sand, gravel, and earth when dry have a natural slope of one in one and a half, that is, the bank has a rise of 1 ft. to every 1 1/2 ft. in. in width measured horizontally. This corresponds to an angle of 33 deg. 41 min. with the horizon. If the earth is moderately damp so that its particles cohere, it will be very possibly made a steeper bank, but the angle will be the same to each foot of the horizontal measurement. This is at an angle of 45 deg. with the horizon.

In all cases it is assumed that the wall is free from sliding along its base, and that it is thick enough to prevent failure by bulging; therefore the only manner in which it can fail is by overturning about its outer edge. We say that it is assumed that the wall will not fail by sliding along its base or by bulging, though practically it does happen that retaining walls do fail in both of these ways from improper construction. But if properly built the thickness of the wall, which is sufficient to prevent failure by overturning, is in almost all cases sufficient to prevent failure by bulging, and if the mortar or cement is as good as it ought to be there will be no fear of such a failure. A properly constructed wall sliding on its base if it is sufficiently strong to resist overturning.

Let us assume, as in fig. 1, that our retaining wall, ABCD, has a vertical back, and that the natural slope is represented by the line DE, then, as we said in our last chapter, the triangle BDE represents the section of the earth which is pressing upon the back of the wall. It is clear that the earth within the triangle BDE is partly supported by the wall below the natural slope BDE, and partly by the resistance of the retaining wall. It necessarily follows that in the triangle BDE part is exerting the greater pressure upon DE, and part the greater pressure upon BD, and if we bisect the angle BDE by the line DF, in which the triangle of maximum pressure BDF, in which the angle of maximum pressure is the angle BDF, whilst the line DF is the slope of maximum pressure.

The value of the angle BDF is easily found then, as we have assumed, the back of the wall D is vertical, by subtracting the angle of the natural slope from 90 deg, and dividing the remainder by 2. And having found the angle we can, by trigonometry, find readily the area of the triangle BDF. The student who is ignorant of trigonometry can, however, by drawing to scale, find the dimension BF, and if BD is known, the area of the triangle BDF can then be found without recourse to trigonometry.

If we assume that the earth at the back of the wall is perfectly dry and devoid of cohesion, as to move readily, then if we suppose the wall to be removed suddenly the triangle of earth BDF would slide down under the influence of a force represented by P in our diagram acting at right angles to the face BD .

of the wall, the point of application G being one-third of the height D to B, whilst the amount of pressure P is :—The weight of the

triangle of earth $B D F \times \frac{B F}{B D}$ which, of course, is equal to the weight of a single cubic foot of the earth multiplied by $\frac{B F^2}{2}$

the problem of retaining walls with earth at the back is not, however, yet completely solved when we have ascertained the amount, direction, and point of application of the pressure *P*, for if we suppose that the pressure is sufficient to cause the wall to overturn about the point *C*, directly it begins to turn a new force comes into operation, which complicates the problem. In order that the wall may turn about the point *C* it is clear that *B D* must rise, and as it rises it will, of course, rub against the surface of the earth hitherto resting against it. Thus friction will ensue between the face of the wall and the face of the earth in contact with each other. This friction is clearly also a retarding force, tending to prevent the wall from turning about the point *C*. Thus the retarding force, which is sufficiently strong, and heavy to rest against the face of the force *P* is excessively strong when the friction of the earth is taken into account. The amount of this friction we can find most readily geometrically as in fig. 2, thus: From *G* draw to scale *GH* representing the amount of *P* found as above, then draw an angle *H G K*, equal to the angle at which dry earth will slip on the brickwork or masonry in question that is used for the construction of the wall. This angle is usually nearly the same as the angle of natural slope. Draw *H K* parallel to *G B*, complete the parallelogram *G H K L*, then *L G* or *K H* on the same scale as we originally drew *G H* is the amount of the frictional force on the back of the wall. Thus *L G* and *H G* representing the magnitude and direction of the forces acting at the point *G*, viz., the force of friction and the horizontal pressure due to the weight of the earth. Consequently in the parallelogram *G H K L* the diagonal *G K* represents in magnitude and direction the resultant of the frictional force and the horizontal pressure, or, in other words, their combined effect in overturning the wall; this we will call *R*. We now have, therefore, the stability of the wall dependent upon two forces: *R*, the overturning force, and *W*, the weight of the wall acting vertically downwards through its centre of gravity; and their resultant *Q*, indicated by the dotted line, tells us whether the stability of the wall is sufficient to resist the overturning power of the earth behind it. If the direction of *Q* passes between the horizontal line between *C* and *D* at the point *C* the wall is on the point of being overturned. If between *C* and *D* the wall is stable, and for safety it is advisable that it should pass between *C* and *D*, in the middle third of the distance *C D*.

We can also test the stability of the wall by taking moments about the point C of the forces W and R. When the moment of W is greater than the moment of R, the wall is stable, when the moments are equal the wall is on the point of being overturned, and when the moment of R is the greater the wall is unstable.

ADDITIONS TO PERTH WATERWORKS.—At a recent meeting of the Perth Water Commissioners the buildings for the new engines at the water house were approved of. The addition consists of a new engine-house to be built to the south of the existing building. The elevation towards Marshall-place is carried out in the same manner as the elevation towards Tay-street. The plans have been prepared by Messrs. James Smart & Son, architects, Perth.

BOOKS RECEIVED.

WAGES CALCULATOR. By M. B. Cotsworth.
(Cotsworth, York.)

GREENWOOD'S TIMBER CALCULATOR. Second edition. (Baxendale & Co., Manchester.)

HANDBOOK TO ELY CATHEDRAL. Edited and revised by the Dean of Ely. (G. H. Tyndall, Ely.)

EMPLOYERS' LIABILITY AND WORKMEN'S COMPENSATION. By Thomas Beven. (Waterlow Bros. & Layton.)

THE WORKMEN'S COMPENSATION ACT.—By J. W. Innes. (Gee & Co.)

APPOINTMENTS.

CLERK OF WORKS APPOINTMENT.—The Pokedown Urban District Council, at their last monthly meeting, had three selected candidates before them for the post of Clerk of Works to the Main Drainage Scheme. Their names were Mr. W. Meates, Cambridge; Mr. J. Howell, Richmond; and Mr. Patterson, Ilkley. The voting resulted in favour of Mr. Meates, and that gentleman was duly appointed. There were fifty-four applicants.

OBITUARY.

MR. HARRON HAYTER.—This eminent engineer died at his residence, in Kensington, on the 18th inst. The deceased, who had reached the age of seventy-three, was one of the best known engineers in Westminster, having been connected in one capacity or another practically all the most important works which have since King's College being founded half of this century. Educated in the Applied Science Department of King's College, London, he afterwards sought practical experience upon the Stockton and Darlington Railway, and was subsequently associated with the Great Northern Railway, the Great Eastern Railway, the North Devon Railway, and in 1862 his connexion with the Institution of Civil Engineers commenced, and thirty years later he was elected President of that society. Mr. Hayter's chief work was in connexion with the Charing Cross and Cannon-street Bridges, the Victoria Embankment, the Holyhead and Abernethy Harbours, the South-West Dock, the Dock in London, and the Amsterdam Ship Canal.*

Mr. J. M. BURNET.—Mr. James Burnet, architect, died at his residence, Ewesbank, Langholm, N.B., on the 8th inst., in his seventy-third year. He belonged to the Melrose district, but about forty-four years ago he received the appointment of architect to the Duke of Buccleuch on his Grace's estates in Eskdale and Liddesdale, which he has held ever since.

MR. J. BLAND.—Mr. John Bland, who for many years practised as an architect in Temple-street, Birmingham, died suddenly in his office on the 16th inst. Mr. Bland was about seventy years of age.

GENERAL BUILDING NEWS.

CATHOLIC CHURCH, TENERE, DUBLIN.—On the 1st inst. the Archbishop of Dublin laid the foundation stone of the new Church of St. Joseph, now in course of erection in the parish of Tenere. The new church will comprise nave, side aisles, transepts, side chapels, sanctuary, and two sacristies, with heating chamber, under. The total length of the church will be 110 ft., and 30 ft. the aisles on each side of the nave will be 48 ft. wide. At the west end of the north aisle a baptistry is provided 12 ft. square, and a tower $10\frac{1}{2}$ ft. square is at the end of the south aisle. The height from the floor of the church to the ceiling is 51 ft., and from the floor to the apex of the roof is 63 ft. The sanctuary and chapels are divided from the nave and the side aisles by a screen resting on columns having moulded bases and capital capitals. The aisles and transepts are divided from the nave on each side by an arcade of five bays. The columns throughout in the internal work are of polished red Aberdeen granite. The church is entered at the west front by a doorway having moulded jambs and capital and moulded capitals, and on the north and south sides of the doorway are two large windows, the pier being a rose window 18 ft. in diameter with shafts radiating from the centre. The tower and spire rise to a height of 160 ft. The principal window of the sanctuary is a three-light window. Each bay of aisles and clerestory is lighted by three semi-circular windows. The style of the church is in the Decorated. The contractors for the work are Messrs. Madden & Son, who have been put out from the designs and under the superintendence of Mr. Wm. H. Byrne, architect, Dublin.

RENOVATION OF AULDEARN PARISH CHURCH, NAIRN.—The designs of Mr. John Robertson, architect, Inverness, for the renovation of Auldearn Parish Church have just been approved of by the Building Committee; and the successful contractors for the various works are:—Masons' work, Messrs. Fraser & M'Intosh, Inverness; carpenters' work, Mr. William Brooman, Nairn; slaters' work, Mr. A. C. Fraser, Inverness; plumbers' work, Mr. John Stewart, Grantown and Nairn; painters' work, Mr.

* The above notice was unavoidably omitted from our last issue.

John Campbell, Nairn; and heating, Messrs. M'Kenzie & Moncur, Edinburgh.

CHURCH IMPROVEMENTS, NEWCASTLE, STAFFORDSHIRE.—Further progress in the completion of the Church of St. Giles's, Newcastle, and its surroundings has been made by the extension and improvement of the churchyard, and the dedication of the new oak pews which have been placed in the church, and of a new stained-glass window at the south-west extremity of the nave. The work in the churchyard has been carried out under the direction of Messrs. Chapman & Snape, and the contractor is Mr. T. Goodwin, of Hanley; the ironwork being supplied by Mr. J. Sant, of Newcastle. The work in connexion with the provision of modern oak seating in the body of the church and the south chapel has been executed by Messrs. Jones & Willis, of Birmingham, from the design of Mr. John Lewis, architect, Newcastle. Three front pews on the south side of the middle aisle are allotted to the Mayor and Corporation on the occasions of their official visits. The new stained-glass window is of three lights, each panel containing two figures, and the whole design typifying the Transfiguration. The window has been supplied by Messrs. Burlison & Grylls, of London.

CHURCH, CANKLOW, NEAR ROTHERHAM.—The foundation stone of a new church was laid at Canklow on the 12th inst. The building, when completed, will consist of nave, aisles, chancel, organ-chamber, vestry, and bell turret; but at present contracts for the nave only have been accepted, the committee hoping to be able to build the chancel and vestry immediately on the completion of the present contract. Messrs. John Brown & Co., who give the land, will also provide the bricks. The dressings will be of terra-cotta. The seating accommodation will be of 412. The flooring will be of wood blocks, and heat will be afforded by means of a low-pressure hot-water system. Mr. E. Isle Hubbard, Rotherham, is the architect; and Mr. W. H. Trehern, Parkgate, the contractor.

WESLEYAN METHODIST BUILDINGS, CHESTERFIELD.—The memorial stone of a new Wesleyan Mission Hall in Hollis-lane, Chesterfield, has just been laid. The new hall will be two stories in height, with six class-rooms underneath and assembly-room above, and will be built of red brick. The assembly-room will measure 50 ft. by 32 ft., and will seat 300 persons. The class-rooms will afford accommodation for 300 Sunday school scholars. The architect is Mr. J. Willis, of Derby, and the builder Mr. R. Peck, of Chesterfield.

METHODIST FREE CHURCH, PLYMOUTH.—This building, situate in Ebrington-street, has just been opened. The buildings comprise church and school-rooms. The church has a gallery all round, and will seat about seven hundred people. There are two vestries on the ground floor, and also a preacher's parlour. On the landing of the gallery staircase on the east side there is a vestry furnished and fitted for a ladies' room, and on the west side a class-room. Under the church there is a schoolroom, with six class-rooms and a library. The infant schoolroom is a separate building on the east of the church. The room above is to be used for the church parlour. On the western side of the building there is a cottage for the caretaker. The premises are heated throughout with hot water. Messrs. Tozer & Son were the builders, and Mr. H. J. Snell was the architect.

WESLEYAN CHURCH, WESTBOURNE, NEAR BOURNEMOUTH.—The memorial stones have just been laid of a Wesleyan church at Westbourne. The building will be in the early Perpendicular style, the materials used being brick with Bath stone dressings. It is to be divided into nave and side aisles, the nave being carried on an arcade of granite shafts, with Portland bases and caps. Provision will be made for the future erection of a gallery at one end of the church, and also for a tower at the south-west corner. The length of the church will be 59 ft. 4 in., and the chancel will be 22 ft. 10 in. beyond that. The height from floor to ceiling will be 32 ft. The width will be 46 ft. 10 in., and a church parlour will be added to the west of the chancel, while to the east will be erected the organ loft and choir vestry. There will be a large central window on the side fronting the Poole-road, with five lights. The roof will be tiled. To the north of the church is the school-room, which is now completed. The entrance is from the Landseer-road, and the width of the building is 22 ft. 6 in., and the length 40 ft. The architect is Mr. Robert Curwen, of London, and the contractors are Messrs. F. Hoare & Sons. The total cost is estimated at about 4,800l.

CONGREGATIONAL CHURCH, WREXHAM.—The foundation stones have just been laid of this building. The plans for the church were prepared by Messrs. Ingall & Son, the contract being secured by Messrs. Lewis Brothers, of Wrexham. The new schools were completed in January, and the congregation occupy that building pending the completion of the church. The whole of the buildings occupy a site at the junction of Salisbury and Percy roads, the schoolroom being 46 ft. 6 in. by 30 ft., with accommodation for 300, and the church, 56 ft. 3 in. by 38 ft., with transepts that give a total width of 56 ft., and seating accommodation for 600. The organ and pulpit will be placed in an apse at the end of the church, where are also placed the

minister's and deacons' vestries, and a kitchen. The church will be heated with low pressure hot-water pipes. The building will be faced with Ruabon brick and stone dressings. It will be surmounted by a tower and spire, rising to a height of 80 ft.

CONGREGATIONAL CHURCH, HULL.—The new Congregational Church for Hull is to take the place of the old Fish-street Church. The church is cruciform, having a nave 52 ft. in length by 25 ft. in width, with north and south aisles 18 ft. 6 in. and 15 ft. 6 in. in depth respectively, and 23 ft. 6 in. in width. There are north and south aisles separated from the nave by an arcade having polished granite shafts with moulded stone caps and bases, the arches being in moulded bricks. The transepts are lighted with mullioned windows having cusped heads and moulded transoms, the aisle windows being similar, but without transoms. There is a clearstory with mullioned and traceried windows on either side of the nave. The principal entrance is at the west, where a vestibule, 28 ft. by 10 ft., is entered by two doors. Communication is made from the vestibule on the south with the stone staircase to the gallery, which also has a separate entrance, while northwards the staircase will be a stairway from the wards of the vestibule to a sitting room. The church will seat 585 persons on the ground floor and 68 in the gallery. The choir is provided for at the east end of the nave behind the pulpit, and in the rear of the church is the minister's vestry, church parlour, 22 ft. by 18 ft., and other offices. At the north-west angle of the nave is a tower, square at its base, but working out into an octagon with red stone bricks. The dressings to windows and doors being in Ancaster stone. The contract for the whole of the work is about 4,800l. The works are being carried out under the direction of the architect, Mr. W. H. Bingley, Hull.

ENLARGEMENT OF CONGREGATIONAL CHURCH, RUGBY.—Foundation-stones have just been laid for the enlargement of the Congregational Church at Rugby. Two new transepts, 23 ft. wide, will be provided, and the chancel will extend 8 ft. beyond. In the transept nearest the school fifty extra seats are to be placed, whilst the transept opposite will contain sittings for twenty-four, in addition to the organ. In the centre of the church eighty sittings will be placed, and nearer the rostrum the choir will be located. The transepts will be lighted by two traceried windows of tinted cathedral glass. There are to be four new entrances—two of these leading into the transepts by porches, and the remainder forming joint approaches to the church and vestries. At the rear a minister's vestry, 14 ft. by 11 ft., is to be erected, and also an occasional vestry, 12 ft. by 11 ft. In addition to minor alterations, the school porch has been set back, and by shifting the boundary wall extra width has been given for approach to the school. The contract of Messrs. Linnell & Son to carry out the additions for 1,280l. has been accepted. The architect is Mr. J. T. Franklin.

SCHOOL, ABERDEEN.—A new school is about to be erected by the Aberdeen School Board at the corner of Albion-street and Hanover-street. Facing Albion-street the building will be 110 ft. long, and Hanover-street, on the east side, it will have a frontage of 70 ft. The school is to be three stories high; and it will be built of grey granite. Four entrance doors are provided for—two in the Albion-street front and two directly opposite. From each of the doors a passage extends across the building to the corresponding door on the other side; then a corridor runs from end to end along the middle of the building on each floor. On each side of this corridor the class-rooms are arranged. The main portion of the space on the Albion-street front on the ground floor is to be devoted to a gymnasium, 50 ft. by 25 ft. 6 in. There is room at the end of the gymnasium for one class-room, and on the other side of the central corridor three more class-rooms are to be provided. On each of the two upper floors six of the corridor. On the ground floor the class-room accommodation is for infants, the older pupils going up to the higher rooms. Cloak-rooms and staircases are to be constructed in projecting wings at the two ends of the building. The new school will accommodate 1,000 pupils. Mr. Arthur Clyne is architect for the new building.

WESLEYAN SUNDAY SCHOOLS, BAILGATE, LINCOLN.—The foundation stones of the new Sunday Schools to be attached to the Bailgate Wesleyan Chapel were laid on the 11th inst. The new schools have been designed by Mr. W. Mortimer, and are to be erected by Messrs. Halkes, Broad, and are to be situated at the rear of the chapel. The main schoolroom will be 55 ft. by 33 ft. 2 in., while there will be five classrooms on the north side, and an infants' schoolroom on the front. There will also be a corresponding classroom and library, with conveniences. On the upper floor will be two classrooms, and the basement will contain the heating apparatus, a boiler-house, and a kitchen. The basement will be connected with the ground floor by means of a lift.

EXTENSION OF BURGH SCHOOL, BURNISLAND, FIFESHIRE.—At the monthly meeting of the Burntisland School Board, on the 5th inst., it was decided to make an extension of the school building. The plans for the extension, which will provide for the addition of a wing to the north of the existing buildings, were approved.

HOSPITAL EXTENSION, LEAMINGTON.—The founda-

tion-stone of the new wing of the Warneford Hospital, Leamington, was laid on the 5th inst. The new wing is part of the original design for the extension of the hospital, and was adopted by Leamington as the local scheme for the commemoration of the Queen's Diamond Jubilee. The new structure, for which Messrs. Young & Hall, London, are architects, will be built on the pavilion principle. The new wing will accommodate thirty-two additional patients. When the new wards are completed the entire capacity of the hospital will be increased to 125 beds.

POLICE BUILDINGS, PETERHEAD.—Plans of the new police buildings for Peterhead have been prepared by Messrs. W. Henderson & Son, architects, Aberdeen. The front elevation, of about 45 ft., facing Merchant-street, will be of red and light-coloured granite. In Tolbooth Wynd there will be an elevation, extending over 90 ft., of hammer-blocked red granite. The main entrance is from Merchant-street, and it leads into the administrative department, where there are a charge room, waiting room, inspector's room, with a passage to the cells, cloak room, and lavatory accommodation. Behind these are the muster room and quarters for four unmarried constables, comprising sleeping rooms for each and a kitchen for general use. There are seven cells, one of which is double. On the first and second floors there are quarters for six married constables.

BUSINESS PREMISES, PERTH.—New offices for the General Accident Assurance Corporation are to be erected in Tay-street and High-street, Perth. The designs are by Mr. George P. K. Young, Perth.

PROPOSED ENLARGEMENT OF BRIDGEWORK HOUSE.—At a meeting of the Bridgend and Gwynedd Bridge Guardians recently, Messrs. J. C. Gwynedd, Committee member, recommended that the sketch plans submitted by the architect (Mr. P. J. Thomas, Bridgend) be presented to the Board. It is proposed to acquire an additional acre of freehold land adjoining the present building for about 1,000l., and to erect thereon a new infirmary, with accommodation for from 80 to 100 beds, as well as to carry out alterations in the present building. The total cost is estimated at from 15,000l. to 20,000l.

BUSINESS PREMISES, SWANSEA.—New premises have just been erected at Swansea for Messrs. B. Evans & Co. The firm bought up and pulled down the shops at the corners of Goat-street and Caer-street, and they have erected a frontage there in consonance with the style of the rest of the buildings, and in doing so they have given up to the Corporation about 100 ft. The premises were erected by Messrs. Lloyd Bros., from the designs of Mr. Rowlands (Messrs. J. P. Jones & Rowlands).

TOWN HALL, LYNTON, DEVONSHIRE.—The foundation stone has just been laid of Lynton Town Hall. The new building will cost about 14,000l. The architect is Mr. Macdonald.

BATHS, SUDBURY.—The new Corporation baths for ladies in Glossop-road have been erected on the site of the old bath and the Bath Saloon. In their place the Corporation have erected, from the designs and under the superintendence of the City Surveyor (Mr. C. F. Wike), a swimming bath for the ladies, with a dressing room, and two foot baths. The swimming bath is 25 ft. wide and 75 ft. long, with a varying depth of from 3 ft. 6 in. to 5 ft. 6 in. The building is of brick with stone facings. The bath is lined with glazed white bricks, and the divisions between the slipper baths are of slate instead of wood. At the Glossop-road end of the building there will be a large window of stained glass. The contract for the building is Mr. George Wale, whose contract amounts to about 5,200l. The heating and engineering work has been carried out by Messrs. Bradford & Company.

HOTEL PREMISES, NEWCASTLE.—Alterations are being carried out at the County Hotel, Neville-street, Newcastle. The improvements include the erection of a new stone front, extending it to double its present length—in all 130 ft. This will bring the present length to the hotel in the middle instead of, as originally, at the west end of the building. Six shops will occupy the ground floor of the hotel, facing Neville-street, three on each side of the main entrance, and cellars will be connected with each. A seventh shop will occupy the Gainger-street part of the altered premises. All above the shops will be reserved to the hotel, and will consist principally of bedrooms, making a total of 140 for the entire building. The extreme west end of the new premises and the Gainger-street west corner will be surmounted by cupolas. The height from the ground floor to the roof is 82 ft., and to the top of the cupolas 95 ft. The cost of the alterations is estimated at 30,000l. Mr. Walter Scott is the contractor, Mr. Smellie the clerk of works, and Mr. M. H. Graham the architect.

CONVALESCENT HOME, LEEDS.—A workpeople's Convalescent Home has just been opened at Horsforth, Leeds. The building consisted originally of two semi-detached villas. The principal entrance is on the south side, and a porch gives access to an entrance hall. To the left of the entrance is the main room, and adjacent are the kitchen, scullery, and other domestic conveniences. A passage to the left gives access to the dining-room, capable of seating from thirty to forty persons. To the right of the entrance are the board-room and the men's day room, with door opening out into a verandah.

Adjoining the day-room is the smoking-room, and at the end of the hall is an exit with a porch leading out to the north side of the building. On the first floor are ten bedrooms for patients, matron, and servants. On the second floor are six bedrooms. There is a total accommodation for thirty-two persons, exclusive of the household. In the basement are the larder, storage-room, wash-kitchen, and ironing-room. All the rooms and corridors are heated with hot water, and there are also open fireplaces in most of the rooms. The building has been remodelled and altered from plans prepared by Mr. Walter A. Hobson, architect.

NEW PAVION AT THE OVAL.—A new pavilion has been erected at the Oval. All the old buildings have been taken down with the exception of the large dining-hall, which is enlarged by nearly one-half its present area, and, with the new professionals' dressing and club rooms, forms the west wing of the new building. The new building occupies the basement floor, lavatories for the members, and under the club-room and bar storage premises. On the ground floor is the members' club-room, 60ft. by 26 ft. overlooking the cricket ground, with a bar in the rear about 50ft. by 18 ft., and at the west end of the club-room are the members' private and writing rooms, and the reading and the committee and secretary's offices. A corridor at each end of the club-room traverses the building and opens on to the stand in front of the club-room. The committee-room and members' dressing-rooms, with lavatory, bathrooms, and necessary conveniences, are situated at the east end of the building. The members' room is provided adjoining the entrance to the side stands, and on the first floor the Press-room, with telegraph-room, lavatories, spare room, &c., an suite. Adjoining the Press-room is the scorers' box, and below the telegraph-room is a printing office. The roofs of the central portion of the pavilion and over the dining hall are constructed of iron and steel, and upon these roofs are stepped "stands." Externally the building is faced with red bricks relieved with Bath stone dressings, and the roofs to stands and over the committee and dressing rooms are covered with Broseley tiles. Electric lighting has been provided for the building, and the heating is by water and coals, supplemented by gas. The architects were Messrs. T. Muirhead & W. Wallis Baldwin.

were Messrs. R. Smith and C. W. Wainwright, and Messrs. J. W. Wainwright and J. W. Wainwright. The foundation-stone has just been laid of the buildings now in course of erection as an electric lighting station at High Wycombe. A site for the electric lighting station was found in a meadow adjoining Lily's walk. The necessary buildings have been designed by Messrs. Moxham & Son, of Wycombe, and include a boiler-house, engine-house, accumulator-house, and various offices. The contract for their erection has been entrusted to Mr. Henry Flint, whose tender amounted to £3,381. The fitting of the works with an electric lighting plant has been placed in the hands of Edmondson's Electric Light Corporation Limited. The fitting of the plant is under the supervision of Mr. J. C. Wigham, representing Messrs. Edmondson, and of the resident engineer, Mr. Farnard.

BIRKINGHAM—THIS BUILDING is in course of erection in New-street, between the Grammar School and Lloyds Bank. The building, which, with its equipment, has cost 20,000*l.*, rises 60 ft. above the street level, while the floor of the sub-basement is 25 ft. below. The site has a frontage of 43 ft., and a depth of 52 ft. The building is a two-story school premises, adjoining for the sub-basement. The building rises to a height of five stories and a mansard. A feature of the hotel is an octagonal corner tower, which rises from the level of the first floor on a played pier of polished Aberdeen granite, is broken by a series of oriel windows, and is surmounted by a short spire. The upper portion of the tower leads towards the central series of projecting oriel windows, terminating with a decorative gable in front of the high-pitched roof. On the first three floors, towards both New-street and the boys' school, are bay windows. The first story is faced with Aberdeen granite. The portico on the right of the principal entrance has had a decorative treatment, and the left has been taken as an extension of the bank premises. An archway and vestibule give access to the hotel and to the café, the latter being in the basement. The hotel proper, entered through a lounge behind the vestibule, commences on the first floor, where, facing New-street, are the commercial-room and the billiard-room, with a fireplace, and the staff and polished mahogany. Behind is the coffee-room, while farther back are a smoke-room, serving-room, and lavatories, a centrally-situated office completing the suite on this floor. The second, third, and fourth floors contain the visitors' bedrooms, forty-eight in all, and each containing a fire-place. In the mansard are sleeping-rooms and a billiard-room, and the staff. The building is detached from its surroundings, and from the first floor upwards three and a half sides have light and air space, while further lighting is afforded by an oblong wellhole, extending from the third floor to the roof. In the rear, towards the bank, is the main staircase, which is of granite, with a wrought-iron balustrade. In the basement, which is reached by a flight of steps from the building, and available for conveying visitors' cycles to a store provided for them in the basement. The artificial lighting throughout the hotel is by

electricity, from the mains of the Electric Supply Company. Messrs. James Moffatt & Sons are the builders, and Mr. J. A. Chatwin is the architect.

THE "GRAND" THEATRE, DOVER.—A company has been formed for building a theatre, together with five shops and residences, on a freehold site covering 17,365 ft. superficial, with a frontage of 151 ft. to Maison Dieu-road, which has been purchased for 2,750l. from the Corporation. Mr. Harry Percival, late Surveyor of Theatres to the London County Council, has prepared the plans and designs for a theatre, in the style of the old theatre, of red brick and stone dressings, having seat accommodation for 1,750 persons, an auditorium 55ft. 6in. wide, and a stage 38 ft. deep by 55 ft. 6 in. wide, with an opening of 27 ft. square, and a height to the gridiron of 56 ft. The nine dressing-rooms are to be in a separate building outside the theatre's main walls, and the pit and stalls will be sunk to ft. below the road level. The cost of the buildings, including the houses and shops, is estimated at £100,000. The theatre is to have a main frontage of 32 ft. and a private road, to ft. wide, on each side. The contractor is Mr. W. J. Adcock, of Dover.

CATHEDRAL MOSQUE FOR LIVERPOOL. A movement is on foot, says the *Liverpool Post*, to erect a cathedral mosque in true Saracenic style in Brougham-terrace, West Derby-road. The residences Nos. 11 and 12, Brougham-terrace were purchased on behalf of the Liverpool Moslems a few years ago, and the site is proposed for the new mosque, and a continental khan for the convenience of visitors from the Far East. Mr. J. H. McGovern, of Liverpool, has made the designs and prepared the plans. The khan will have a frontage to Brougham-terrace, and at the rear of the hostel will be a terrace, courtyard, and central dome-tomb. Facing Baker-street, and at the corner of Marsden-street, the cathedral site will be a square of 6,000 sq. ft. of ground, valued at £5,000. Fully 1,500 worshippers will find accommodation in the mosque. Owing to the position of the site, special treatment has been given to it by the architect, so that the Mihrab, or niche for the Koran, which really constitutes a mosque, shall indicate the Kiblah, or direction of Mecca. The mihrab (pulpit) and dikhra (pulpit) will be in the centre of the front of the mosque, and the galleries, exclusively used by ladies. There will be two minarets in Baker-street. The north one will form the main entrance, and from the south one the azan, or call to prayer, will be given. A third minaret will be situated in Marsden-street. The flat iron and concrete roof of the building is to be crowned by a Saracenic dome. The building is in the simplest of its geometrical form. In the basement of the building will be the printing works, whence will be issued Islamic literature for distribution in this country.

SANITARY AND ENGINEERING NEWS.

SWANSEA WATER WORKS.—At the Swansea Guildhall recently, Colonel Buloyns, R.E., Local Government Board Inspector, held an inquiry respecting an application from the Corporation for permission to borrow another 100,000l. on account of its new water works scheme at Cray. Mr. Jevons (deputy town clerk) explained that the Corporation were authorised by Act of Parliament to construct a water reservoir at Cray, to make a tunnel, and to lay pipes to the town. At the present time they had simply carried out the laying of the pipes. The expenditure authorised by the Act was 270,000l., which might be increased afterwards with the sanction of the Local Government Board. At the present time 97,400l. had been spent on the laying of the pipes and the acquisition of the land, &c., which left 172,600l. in hand. The lowest tender for the completion of the work of constructing the dam, the tunnel, and the laying of the pipes would require another 100,000l. Mr. Hill (consulting engineer) said he was quite sure the dam would be absolutely safe.

PONTEFRACT AND THE SEPTIC SYSTEM.—At a meeting of the Pontefract Town Council recently, the Mayor (Alderman Maud) gave the result of the visit of a deputation to Exeter to inspect the septic system of sewage treatment. The Council decided to adopt the system, at a cost of about 300*l.* The existing sewage works will be used, and all that will be needed will be the acquisition of septic tanks.

THE TREATMENT OF SEWAGE.—In the House of Commons a few days ago, Lord Balcarras asked the President of the Local Government Board whether he could now state the *personnel* of and the terms of reference to the Royal Commission on the disposal and treatment of sewage. Mr. Chaplin said that the commissioners appointed were Sir John Smith (chairman), Mr. J. H. G. Gurne Thorne, K.C.B., Mr. Thomas M. Foster, Professor Wm. Ramsay, Major-General Constantine Phipps Carey, Dr. James Burn Russell, Colonel Harding, Mr. William Killick, and Mr. Charles Cotton. The commissioners were appointed to inquire (1) what method or methods of treating and disposing of sewage (including any liquid from any factory or manufacturing process) might properly be adopted; (2) what requirements of the existing law, for the protection of public health, and for the economical and efficient discharge of the duties of local authorities; and if more than

one method might be so adopted, by what rules in relation to the nature and volume of the sewage, or the population to be served, or other varying circumstances or requirements, should the particular method of treatment and disposal to be adopted be determined; and (2) to make any recommendations which might be deemed desirable with reference to the treatment and disposal of sewage.

MORECAMBE SEWERAGE.—At a special meeting of the Morecambe Urban District Council, held on the 11th inst., the details of the sewerage scheme prepared by Mr. H. Bertram Nichols, C.E., of Birmingham, were approved, and it was resolved that application be made to the Local Government Board for sanction to borrow 60,000*l.* to carry out the works.

MANCHESTER SEWAGE DIFFICULTIES.—On the 12th inst. the Manchester County Stipendiary dismissed an application by the Corporation for an extension of time within which to complete their sewage scheme. As a result, the Corporation will be proceeded against for polluting the ship canal.

be procured against for building or ship canal. SEWAGE DISPOSAL, COSSALL, NOTTINGHAM.—The Rural District Council, Bassetlaw, have applied to the Local Government Board for sanction to borrow £2,300, for purposes of sewerage and sewage disposal for the parish of Cossall, an inquiry was conducted for the 11th inst. in the National School, Cossall, on behalf of the Department, by Colonel W. Langton Coke, M.Inst.C.E. There were present representing Basford Mr. S. Maylan (Surveyor and Inspector), Mr. H. Walker (Engineer of Works), Mr. Dutton Walker (Assistant Engineer), and others.

SEWERAGE SCHEME, ALDEBURGH.—A Local Government Board Inquiry has just been held at Aldeburgh respecting an application of the Town Council of the Borough to borrow £1,000. for the purpose of sewerage disposal. The engineer is Mr. Mansergh, and evidence was given on his behalf by Mr. G. R. Strachan, C.E.

NEW BUTE DOCK, CARDIFF.—The contract for the construction of the new Bute Dock at Cardiff has just been let to Messrs. Topham, Jones, & Railton, of Westminster. The work will be executed at schedule prices, and the total is estimated to amount to 550,000*l*. This contract refers to the dock only, the construction of the pier (not the low-water passenger pier, but a spur at the entrance of the dock) and the dredging of the channel being the subject of separate tenders.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, TRINITY U.F. CHURCH, POLLOKSHIELDS.—A memorial window has been placed in Trinity U.F. Church, Pollokshields. The window is one of four lights, with tracery at top, being divided by a transom, and shows eight panels, each panel representing different events in the life of our Saviour. The glass stainers who have executed the work are Messrs. Walker & Fyfe; the cartoons are from the studio of Mr. Harrington Mann. Sketches for the window were drawn out by both parties in competition, and by instruction of the congregation in execution. The window has been executed under the supervision of Mr. W. G. Rowan, the architect of the church.—*Glasgow Herald*.

CARVED OAK WORK, CLONFERT CATHEDRAL.—Some carved oak work has been recently erected in the chancel of Clonfert Cathedral, consisting of the choir stalls and the Bishop's throne. The clergy stalls are for the Canons of the Cathedral. In addition, there are seats for the Dean and Archdeacon. The work has been carried out by the contractors, Messrs. Sharp & Emery, of Dublin, in accordance with the designs of Mr. J. F. Fuller, F.S.A., the architect.

FOREIGN.

FRANCE.—M. Bernier, architect of the new Opera Comique, has been elected member of the Académie des Beaux-Arts in place of the late M. Ginain. M. Stanislas-Louis-Bernier, who was born in Paris, is a pupil of M. Daumet, and of the Ecole des Beaux-Arts. He gained the prix de Rome in 1872, and the medal in the Salon of 1878, as well as those of the exhibitions of 1876 and 1880. He was awarded the Chevalerie of the Légion d'Honneur in 1885. A new Salon is being arranged at the Louvre, in which will be placed some beautiful works of art and furniture of the eighteenth century, which have come from the Châteaux of Saint Cloud, Meudon, and Compiègne. There is also some old Sevres, and a fine ceiling by Boucher.—The municipal administration has just opened to the public the new historical library of the Hôtel de Ville, at the Grand Hotel. The Hôtel Carnavalet to the Hôtel Le Pelletier de Saint Fargeau, Rue Sevigné.—The extending of the line of the

Orleans railway to the Quai d'Orsay has necessitated the displacement of a certain number of sewers on the left bank, and in the course of the work several objects of interest have been discovered which the "Commission de Vieux Paris" has taken possession of for the Carnavalet Museum. Amongst the number may be mentioned a stone, carved with figures and armorial bearings, belonging to the old church of Saint André des Arcs, some remains of columns

some Roman and mediæval pottery, and, lastly, an old canon or "bombarde," dating from the fourteenth century."—On Saturday last the Margolin-Scheffer gallery was inaugurated in the museum at Rouen. It contains a large collection of drawings left by Madame Margolin, daughter of Ary Scheffer. Amongst the drawings are two works by Eugène Delacroix, some drawings by Pils, Flandrin, Troyon, Fromentin, Théodore Rousseau, Ingres, Cabanel, Benouville, besides some water-colours by Baye and Tony Johannot.—At the suggestion of M. Gosset, architect, a subscription has just been opened at Reims to erect in the cathedral a commemorative stele in honour of Jean d'Orbais, architect, and of the Archbishop Albin de Humbert, founder of this great architectural monument.—M. Boulin has been elected President for 1898 of the Société des Architectes of the Department of the Loire.—The death is announced, at the age of eighty-eight, of the French engraver, Alphonse Masson, a pupil of Decamp and Ingres. He exhibited for the first time in 1835. He had engraved the principal works of François Millet, Rousseau, Chas. Jacques, Ribot, Delacroix, and other eminent artists.—We hear also with regret of the death, of the age of fifty-one, of Felix Buhot, a painter and etcher of high talent, with an unusual knowledge of the technique of etching. A pupil of Pils, he had abandoned painting to devote himself entirely to original etchings, in which he made a great success, and impressions of his plates were in much request among amateurs in England and America. The illustrations which he executed for some of the romances of Barbier d'Aurville and of Alphonse Daudet were among his best work. He had also executed a large series of views of London.—The Minister of Commerce has just definitely approved of the plans for the façades of the different places which are to be erected in the Champ de Mars and on the Esplanade des Invalides. The buildings will be commenced next month.—The Musée de Longchamp at Marseilles has just received some additions; a fine drawing, by Pierre Puget, of the "Rade de Marseille," also a portrait by Hyacinthe Rigaud, and twelve drawings by Elie Delaunay.—The Société Française d'Archéologie, founded at Caen in 1834, will open its sixty-fifth session in July this year at Bourges, under the Presidency of M. de Marsy.—M. Le Deschault, architect des bâtiments civils, has just submitted his designs to the Minister of Fine Arts, for replacing the wooden monuments covering the remains of Voltaire and Rousseau in the Pantheon by monuments of a more severe character, made of yellow Sienna marble.—The new aqueduct which is to convey the waters of the Loing and Lunain to Paris has just been commenced at Fontainebleau.—The work of improving the port at Nice is to be begun very soon.—M. Eugène Pierron has just been elected "architecte voyer-en-chef" of the city of Paris, in place of M. Alphonse Legros, retired.

AUSTRIA.—The monument to the poet Raimund will shortly be uncovered; it has been decided by the Committee, under the presidency of Councillor Nikolaus Dumba, to hold the inaugural ceremony on June 1—the birthday of the subject of the memorial. The monument, which has been executed by Herr Franz Vogl, will stand before the portico of the German Volkstheater at Vienna. It represents Raimund seated in meditation with an allegorical figure behind him symbolising his muse inspiring inspiration to him.—The Spinnerin am Kreuz is the handsomest wayside monument in Austria. It is over 60 ft. high, and dates from the palmy days of the Gothic period. It is in the form of a tower built on a triangular plan. Six niches contain representations of the scenes of the Passion in relief. Between these stand six figures of saints, standing on beautiful pedestals. Farther up are the portrait busts and arms of the builders. Above this again are statues of the twelve Apostles, winged angels with scrolls, and figures of Christ and the Virgin. The restoration of this work was undertaken twelve years ago, and cost more than 18,000 florins. It has, however, been disfigured by mean shops clustered round it, which the people of Neustadt, where it stands, have long been anxious to pull down, but the owner put so prohibitive a price upon them that the work has been impossible. With admirable public spirit, however, the Bank of Neustadt has come forward and bought up the shops for 38,000 florins, and it is now to be hoped that this work of art will at last be properly seen.—The long-projected enlargement of the city warehouses of Vienna will be carried out in the course of the present year. The new elevators, petroleum reservoirs, and the enlargement of the wine-cellar will cost 2,000,000 florins.—The directors of the General Hospital at Vienna have, with the sanction of the Lower Austrian Government, erected an annex for providing their own building with light after the system invented by Dr. Strache, lecturer at the Technical High School of Vienna. The annex is erected on a square of 120 metres behind the pathological and anatomical laboratory, and is planned to supply a daily demand for 200,000 cubic metres of water-gas. Water-gas costs about half the price of ordinary gas, and gives a much brighter light, and is also to be recommended on

* The foregoing portion of these notes was held over from last week.

sanitary grounds.—Consent has been obtained to the building of a temporary theatre on the Kahlenberge, Vienna.—Herr Raimund Jeblinger has been entrusted with the task of preparing plans for a new church at Amstetter.—Herr Moll, an artist of Vienna, has communicated with the Town Council of Vienna, offering to carry out, without remuneration, a design for a monumental fountain, left by the late Victor Tligner, and now in Herr Moll's possession. The offer has been accepted, and the fountain is to be erected on a site selected on the Stefansplatz. The estimated cost will be about 7,400 florins.—A monument for the soldiers who fell in the neighbourhood of Kratzau, Bohemia, in 1866, is to be erected in the town, from the designs of Herr Emanuel Gerhardt, sculptor and professor at the technical school in Reichenberg. The monument will be nearly 5 metres high, and is to consist of a pedestal on which an obelisk stands, in front of which is a figure bearing the arms of Germany and Austria. At her feet is a war fury, and above her the imperial crown of Austria. In the middle is a figure emblematical of peace.—The plans for new public baths at Simmering have not been passed owing to their costliness (about 56,000 florins). The Municipal building office has allowed four weeks in which to prepare a cheaper plan. The use of a smoke-conversion apparatus is to be taken into consideration.—An extensive meadow-land has been freed that is situated at the foot of the Ruckerberg which has already been laid out in villas. The first villa on the new ground, which is being erected by Messrs. Stirk & Weixl for Herr Gernot, is approaching completion.—An asylum for 200 incurables of both sexes is to be erected at Laibach as a jubilee memorial, at a cost of 500,000 florins. Herr Adolf Rossmann is to be the architect.—Herr Schmalz, the owner of the Elnod mineral bath, has been granted powers to bring a light and power electric installation into the town of Friesach. A central station is to be built, beside the works acquired by him from the Alpine Mountain Company. Herr Mayrgundner is to be the engineer; Messrs. Ackermann & Madlde, of Klagenfurt, will be entrusted with the hydraulic, and Messrs. Ganz & Co. with the electric works.—An electric station for the town of Kufstein is also to be built; Messrs. Schuckert & Co., of Vienna, will be entrusted with the contract. The work is to be completed in five months.

MISCELLANEOUS.

ACCINGTON MASTER BUILDERS' ASSOCIATION.—At the Derby Hotel recently, the annual dinner and meeting of members of the Accington Master Builders' Association was held. Mr. H. Ramsbottom presided. At the subsequent proceedings, Mr. Wm. Ormerod, the Secretary, read the report, which stated that the trade of Accington and district was in a very good condition, and the relations existing between masters and men were satisfactory. There was no dispute at present as to wages in the district, the only thing approaching it being a letter from the operative joiners relating to imported joinery and its future, which letter would be laid before the master joiners. There were thirty-two subscribing and ten honorary members of the Association, and it had now become amalgamated with the Manchester and Liverpool and District Association, and the united organisation would in the future be known as the Lancashire and Cheshire Building Trades Employers' Federation. Particulars of disputes between masters and men as to wages, &c., would in future, after being communicated to the local Secretary, be forwarded to the general Secretary to deal with. The report was adopted, and the Chairman afterwards gave an address.

FISHERIES EXHIBITION, ABERDEEN.—Mr. John Rust, City Architect, has prepared sketch-plans of the Exhibition buildings, to cover nine acres, and to cost 9,000l. The plans are recommended to the Executive for approval. It is proposed to hold the Exhibition next year on the Queen's Links, the total area to be enclosed being twenty acres.

FEDERATION OF BUILDING TRADE EMPLOYERS.—The first general meeting of the Northern Counties Federation of Building Trade Employers was held at the Empress Hotel, Sunderland, recently. On the motion of Mr. Ranken (Sunderland), seconded by Mr. Robertson (South Shields), Mr. Walter Lowry (Newcastle-on-Tyne) was elected President of the Federation. Mr. D. Ranken was elected Vice-President, and Mr. J. M. White Hon. Treasurer. Mr. Wilton A. Rycroft, chartered accountant, of Newcastle, was appointed Secretary.

NATIONAL ASSOCIATION OF SLATE MERCHANTS AND SLATERS.—The last year's meeting of the members of the National Association of Slate Merchants and Slaters was held at Furness Abbey recently. The President of the Association, Mr. W. R. Thompson, of Dewsbury, presided, and about 100 delegates were present. The President, in his opening address, said the question of working rules was becoming of more importance than the wage question. They saw operative workmen endeavouring to impose working rules which were generally considered intolerable, and that Association might in future be asked to consider how such demands should be met. The Compensation for Accidents Bill, he said, was far-reaching, and entirely in

favour of the workmen. So largely were the risks increased that insurance companies had raised the rates of premium to from 20s. to 37s. 6d. per 100l. of wages paid. He advised the members to protect themselves by insurance, and to recruit themselves for this end by putting 1/6d. per hour on all labour. The hon. secretary (Mr. J. Townsley, Hull) read his report, which was accepted as satisfactory. He explained that the Central Board was dealing with the trade disturbances at Huddersfield, Barnsley, and South Shields. Papers were read by Mr. Eames, Bangor; Mr. F. W. Spink, Hull; Mr. Starkey, Leicester; and Mr. S. Atkinson, Leeds.

BORDER BUILDERS AND WORKMEN'S COMPENSATION.—A meeting of the Border builders was held in the Good Templar Hall, Galashiels, recently, to consider a proposal to form a company for the district to make provision for the increased responsibility of employers connected with the building trade by the Workmen's Compensation Act. Mr. Adam Herbertson, Galashiels, presided, and explained that it was proposed to form a company with a capital of 1,000l., in 1,000 shares of 1l. each share, to carry with it a guarantee of 10l. such guarantee to be called up, if necessary, for meeting claims for which the premium income and reserve and issued capital might be insufficient. He (Mr. Herbertson) had been in communication with the Ocean Accident and Guarantee Association (Limited), who quoted rates for builders at 22s. 6d. per 100l. of wages paid, and for some of the other branches of the trade the rates were as low as 15s. That was for joiners. For saw millers the rates ranged from 25s. to 45s. If they were to avail themselves of these rates, however, they would require to form a branch of the Scottish Building Trades Association, and he was opposed to having to do with more than one company. Mr. Ruthven, plumber, Galashiels, said he heard that the Equitable Company had quoted the rate at 15s., and Bailie Lindsay, Galashiels, said he knew of another London company likely to fix the premium at 17s. He moved that a company be formed for the district, and that the question of rates and other details be left to a future meeting, when more definite information as to what was being done by others might be before them. Mr. Tweedie, plumber, Galashiels, seconded, and this was agreed to. The meeting seemed favourable to reducing the guarantee of 10l. pertaining to each share to 5l., being confident that this would be ample to meet the requirements of the district, in which hitherto very few accidents have occurred.

SHEFFIELD MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Sheffield Master Builders' Association was held at Berry's Restaurant, Moorhead, on the 12th inst. There were present, amongst others, Messrs. J. Longden, President, J. Biggin, Vice-President, and J. Spink, hon. secretary. The loyal toasts were honoured, and then Mr. Coward submitted the toast of "The City and Trade of Sheffield," coupled with the name of Mr. W. D. Forsdike, who replied.—Mr. Brumby proposed "The City Corporation," and Mr. Carr replied. The tramways, since they had been taken over by the Corporation, had been a continued success, and he hoped they would still be.—Mr. Biggin, in submitting "The Sheffield Master Builders' Association," spoke of the importance of the building trade, mentioning that it employed more men than any other industry, except agriculture. A million pounds were paid weekly in wages, and another million was spent in materials. The Sheffield Master Builders' Association had doubled its membership during the past year. The dispute with the masons was now settled. In the rules a clause had been inserted constituting a conciliation board, to consist of six employers and six workmen to arrange any differences which might arise without resorting to strikes.—Mr. A. Forsdike responded.—Mr. Spink proposed "The Yorkshire Federation." He said that the Federation was the outcome of the formation of associations. They were forming a universal federation, which would have a very important bearing in regard to strikes. But first they were forming conciliation boards everywhere to prevent strikes.—Mr. J. Dawson replied.

SALES OF PROPERTY.—On the 25th inst., at Aberdeen, the Wardhouse (4,440 acres, with 2,580l. rental) and Kildrummie (about 7,890 acres, with 3,525l. rental), estates in Aberdeenshire; the latter lies in the district of Upper Doniside, and contains the ruins of Kildrummie Castle. The castle, one of the largest in Scotland, was built by Gilbert, Bishop of Cathness, during the reign of Alexander II. (who died in 1249) on a cliff rising from the plain, or strath, near the river's left bank. The plan is quadrangular, the south side projecting into the loch, its middle, where is the entrance gateway. lofty and gaily, having six round towers at the angles and gateway, surround the enceinte, the Snow Tower at the north-west angle being 53 ft. in diameter, with walls 10 ft. 6 in. thick. Against the north front, 200 ft. long, is the great hall, measuring 75 ft. by 41 ft., at the east side is the chapel, about 35 ft. by 20 ft., where, in its only remaining (east) wall, are three thirteenth century tall lancet windows. Messrs. D. McGibbon and T. Ross, in Vol. I. of their work upon the Castellar and Domestic Architecture of Scotland, direct attention to the unusual form of the north-east tower windows, as pointing, seemingly, to the English occupation for its origin, being the square-headed trefoil common in Edward-

EDINBURGH MASONS AND THE NINE-HOURS' DAY.
—A mass meeting of operative masons of Edinburgh

and Leith was held on the 5th inst. to reconsider the resolution passed at the meeting held recently with reference to the hours of labour. It was then agreed by 432 to 395 to revert to the fifty-one hours' week—nine hours each day except Saturday, when they should work six hours. On the 5th inst. it was proposed that the minutes of that meeting be confirmed. An amendment was moved to the effect that that part of the minute referring to the hours be rescinded. After considerable discussion, a vote by ballot was taken. On the vote being counted, it was intimated that 368 were in favour of the nine-hours day and 353 for the eight-hours' day. The minute was therefore declared confirmed. Subsequently a letter was read from the employers in reply to one in which the operatives' secretary intimated the result of the last meeting. It expressed gratification that the men had agreed to go back to the fifty-one hours' week, intimated that the employers would not press for a reduction of wages from 9d. to 6d. per hour, but stated that car fares would only be paid beyond the new municipal boundary instead of the old. The latter point raised a new discussion, some holding that they should stand to the old boundary as already agreed to. The majority of the members left the hall, however, and the chairman had to declare the meeting adjourned to settle this question.

NORTHAMPTON PLASTERERS' AND THEIR WAGES.—The dispute which has for some time existed between the masters in the building trade and the plasterers has, it is stated, arrived at a mutual settlement, the masters having offered to increase the wages by the addition of 3d. per hour, which is half the amount appealed for. It has also been agreed to alter one of the rules to read as follows: "That the men be allowed to have one apprentice to two men and two apprentices to four men."

SWANSEA MASONS' STRIKE.—Meetings in connexion with the Swansea masons' strike were held on Friday and Saturday afternoons last week, but both proved futile. The men's committee declined to go back to work on the old terms, and also decided to recommend the men not to agree to a compromise in the shape of 2d. per hour advance, or to accept Cardiff terms, as Cardiff is a free town for stone. A mass meeting held on Saturday decided to reject the masters' proposals.

THE CARPENTERS' STRIKE, WESTON-SUPER-MARE.—The master builders having withdrawn their demand with respect to the alteration of the working rules of the Amalgamated Society of Carpenters and Joiners, and having signed the rules as submitted, the men have resumed work.

LEGAL.

THE WESTMINSTER BUILDING DISASTER.

At the Coroner's Court, Horseferry-road, on Thursday last week, Mr. John Troutbeck, the Westminster Coroner, resumed his inquiry (with Mr. John Slater as assessor), into the deaths of William Clifford Morse, Joseph Henry Parker, Charles Weatherley, Ernest George Lillywhite, Hugh John Bray, George Bridge Hillings, and Henry Clements, who were killed through the collapse of a building in Orchard-street, Victoria-street, Westminster, on the 21st. ult. Mr. Blenkinsopp, one of her Majesty's Inspectors of Factories, appeared for the Home Office; Mr. A. C. Kent for Mr. W. Rickard, the chief contractor; Mr. A. A. Thompson for the General Labourers' Amalgamated Union; Mr. G. S. Edwards for the roof contractor, Mr. S. Murrell; Mr. Hugh Fraser for Mr. Drury, the District Surveyor; Mr. A. A. Hudson for Messrs. Drew-Bear, Perks & Co., and Bank's Fireproof Construction Syndicate; while Mr. T. Blashill, Superintending Architect to the London County Council, and Mr. Seager Berry, appeared for that body. Mr. Horace Avory now appeared to watch the interests of Mr. Pawley, the architect, and Mr. Young appeared for Mrs. Leeds.

James John Andrews, a foreman carpenter and joiner (recalled), said he believed he made the bed of concrete 5 ft. in the foundations, according to the plans now before the Court. The ground work was made of ballast over the London clay in the ordinary way. The footings for the pier were seven courses of brickwork in extent, and 4 ft. 1½ in. wide at the bottom. According to the terms of the Building Act, footings should be twice the thickness of the wall. He believed the footings were put in for a thicker wall.

Mr. Rickard (recalled and cross-examined by Mr. Young) produced an agreement entered into between him and Mrs. Leeds on November 12.—Mr. Avory: Mrs. Leeds had the freehold, and appointed Mr. Rickard to build, and it was his venture; but in November he sold his interest in the building to Mrs. Leeds for 1,000l., and agreed to finish the building at prime cost.—The Coroner: Can you explain how the condemned bricks came to be brought from another building and used here?

—Mr. Young: I am afraid we shall have to get it from Mr. Pawley.—The Coroner: Yes; but was there any difference in price?—The Witness: No, all the bricks were two guineas a thousand, and were all one quality. Bricks were high in price last autumn, but 42s. per 1,000 was a fair price for bricks ordered a considerable time before.—Mr. Young: All the bricks are still on the building.—The

Coroner: I have not said they were not, but we have it that the witness or some one said the men were to make the best of them.—The Witness: I never said so.—The Coroner: But who condemned them? Mr. Pawley.—The Coroner: But we have been told that some of them were used in the building. Was that so?—The Witness: It is possible. The bricks were condemned by Mr. Pawley, the architect, at another job. Mr. Pawley told witness that those bricks were rather soft, and ought not to be used for the bottom part of the building. The best of the bricks might have been used for the inside walls.—Mr. Avory: When Mr. Pawley condemned these bricks at the other job, did you not lead him to understand that they would be ground up for mortar? Quite so, or most of them. I do not think they were all bad.—Mr. Avory: But all those he condemned you gave him to understand would be ground up for mortar? Yes. The witness, in reply to further questions, said Mrs. Leeds was the widow of a builder by whom witness had for many years been employed as building contractor. Mr. Pawley acted merely as architect, and witness paid his fees.

Mr. C. W. Courtney, stonemason, of Fulham, said that he supplied the templets used at Abbey-mansions. He was very seldom at the job. He was represented by the witness Collins, who was his responsible man. The five templets were 3 ft. 2 in. by 1 ft. 7 in., and 4 in. in thickness. He supplied them as ordered.

Mr. Tom Drew-Bear was next called, and stated that his firm supplied some of the girders. They were of various lengths, according to the order, and he suggested a scheme as to the best means of placing and fixing them, but his suggestions were not adopted. The girders were delivered as required, but the witness had nothing to do with the fixing of them.

Mr. Samuel Murrell, engineer, Victoria-street, said that he had a contract for the iron and concrete. He connected the roof, but did not make it. He hoisted the main girder and fixed the skylights, taking instructions, in the first place from Dixey, the carpenter for Simpson. When the roof was erected he started on the concrete. He never saw any specifications concerning the concrete, and received no instructions on the subject. He knew there must be specifications, but was never told about them. He had employed as many as twenty-three men on the concreting, the usual number being seventeen. On the Thursday after Easter, April 14, he received instructions from Mr. Andrews to alter three skylights. By that time the whole of the concreting was completed, and the witness refused to alter them until he was told to do so by Mr. Simpson. Mr. Andrews then came up to the roof together with Dixey, the carpenter, and Parker. There was some discussion as to who had made the mistake in putting in the skylights, but it ended by Andrews saying that no matter whose fault it was, it had to be altered; eventually some of the concrete was cut away but none of the concrete that ran along side the pier was interfered with; only that on the north and south of the centre skylight. As the cutting went on the joists were redrilled and bolted up. The concrete on the south side, which was last put in, was quite set and hard. When the girders had been rebolted, he had some cement and breeze hoisted to the roof. By Saturday, April 16, the work had been done, and the alterations effected. He did not see the roof more than once during the following week, and he believed that none of his men went up there. On the day of the accident he was at the St. James's-court, and none of his men were at work on the roof. He had lunch with Simpson, whose last words to him on parting were "Don't let any of your men strike that centring. But get on with the seventh floor joists." A little later he heard of the calamity. The centring had been put up by witness's men, under Parker. It was made of new material. He got on the roof at six o'clock, and found the centring on the roof of the adjoining block, it having been struck. There were several survivors of the accident, who would explain what happened. As to Mr. Beckley's evidence of the alleged improper mixing of the concrete, the material would speak for itself. By the Coroner: External concrete round the skylight, in his opinion, the concrete had not set at the time of the accident. It required fourteen or fifteen days in which to set, sometimes three weeks. He also supplied the machinery and the steel joists for a portion of the building. He had no doubt as to the quality of where his joists were put, but he supplied only four.

By Mr. Thompson: No doubt his men did strike the centring. To Mr. Gardiner (solicitor for the relatives of one of the deceased men): If the centring were removed, he thought it would cause the concrete to fall. He did not think that was the sole cause of the accident. A winch had been left close to the staircase, and he had been informed that a "snatch" had been fixed to the pier, which had shot out through a weight being raised by the winch. One man could exert seven tons on the pier with the assistance of the snatch block, and any pier, however strong, would succumb to that pressure.

Joseph Smith, a labourer in the employment of the previous witness, deposed that a month before the accident he drilled six holes in the girders under the skylight.

John Hammond, who described himself as a

"skilled labourer," said that on the day of the occurrence Parker (deceased) told him and five other men, four of whom were dead, to strike the whole of the centring. They began at two o'clock, after dinner. The concrete was very hard, and just before the collapse he remarked that it sounded like a drum. He was certain the concrete did not go first. He was on his knees on the coping, and before he could turn round the whole roof had collapsed without any previous warning. He considered the concrete was quite fit for striking. There were three poles lashed across the centre skylight, and tackle attached to them. He did not think it was being used while they were striking the centring. He felt no vibration. To the Coroner: He could not account for the collapse. Concrete had set well, and been fit for striking in eight days. He had "bounced his crowbar" on the concrete, when he told his mates it sounded like a drum. Four of the men killed on the roof with the witness, and Parker, the foreman, was on the scaffold underneath looking to see how the concrete looked after the boards were removed.

The inquiry was then adjourned till Monday, when Mr. Horace Avory said he wished to make a statement as regarded the position of Mrs. Leeds in this case and that of Mr. Pawley. He had already stated that Mrs. Leeds was the freeholder, but on examination of the documents he found that Mrs. Leeds obtained the lease from the Greycoat Hospital with the option of purchase, and subsequently she acquired the freehold. She granted the building agreement to Mr. Rickard, and then became the trustee of the building. Then she purchased back from Mr. Rickard his agreement for 1,000l., or in other words, he was to complete the building for the 1,000l., and the liability was to take it over on completion. The Coroner: Then we are to really conclude that Mrs. Leeds was the trustee in the affair? Mr. Avory: Yes, according to documents that will be put in. The Coroner: But, Mr. Avory, if what you say is correct, then Mrs. Leeds has really nothing further to do in this matter? Mr. Avory: This is what I wish to be understood; and I take the responsibility of the matter. The Coroner: Then we will dismiss her from the case.

John Hammond (recalled) said that he was positive there were no cracks in the concrete at the time they were knocking away the centring of the concrete. He would still adhere to his evidence on the last occasion—that the building collapsed and not first the concrete. He was sure the concrete did not give way first.—By Mr. Kent: He heard some givings just before the accident, and thought it was the poles of the scaffold, and for the moment, thought some one was moving them, but instantly the whole building collapsed.

John Peckham, a carpenter, said that he was employed by Messrs. James Smith & Son, of Norwood Junction, who had the contract for the car-pentering. He had been on the job two days when the accident occurred, and at the actual moment of the disaster he was working on the roof sorting some material for the frames of the skylights. He noticed just before the accident that there was a great strain on the block which had been placed across the skylight, evidently put there for hoisting. He could not say who was using it, but he had heard a squeaking noise from it as though whatever was being raised was too great a strain. The three poles on which the block was working would hold about a ton, he thought; certainly not seven tons. When the collapse occurred, he could not actually say whether or not anything was being hoisted, but he distinctly heard the sound of two or three cracks as if on the breeze concrete, but the whole place went at once.—The Coroner: You have heard the evidence of the last witness; do you agree in substance with him?—The Witness: Mainly, except as regards the north light (skylight). The cement round it was soft.—Cross-examined by Mr. Avory: It was his opinion that the striking of the centring round the north light was the cause of the accident.—Do you know why it was soft?—Because it had not had time to set.—Further cross-examined, the witness said he had heard a sound of falling scaffold boards, but he could not say they were the centring boards. Mr. Avory then put in his statement made by the witness, in which he had said on May 4 that he heard the sound of centring boards being knocked about and falling just before the roof collapsed.

Thomas Coppings, also a carpenter and joiner, said he was working with the last witness at the time of the accident, by the middle light on the roof. He heard the last witness shout out, "Get out," and he then saw the roof of the building's going down, and he saw the centring being knocked away. He had noticed that some one was hoisting with a three-sheet-block at the middle light right up to the time of the accident.—The Coroner: I suppose these men who were hoisting are not all killed, and that we shall have further evidence on this point?—Mr. Avory: It is a most

important point, but at present we have been unable to find out what this hoisting was. The Coroner (to the witness): Have you ever suggested that this hoisting was the cause of the accident?—The Witness: The creaking led me to believe so.—Have you any real reason for suggesting it?—No, barring the creaking.—Mr. Avory: Do you believe the knocking of the centring had any cause in the collapse?—The Witness: Yes.—Why?—Because it did not appear set.—The Coroner: Did you speak to the foreman about knocking the centring away?—The Witness: No.

Mr. Murrell, the contractor for the roof, recalled, said that Mr. Simpson, the assistant architect, said to him, "Don't you know that your men were hoisting iron at the time? Smith's men say that a noise was coming from the block?" He could not say his winch was being used, but he thought it was, and that the "snatch" was fastened to the pier. That was what made him say that one man could exert seven tons on the pier. It was merely a theory, he had no evidence on the point. By Mr. Avory: A block would squeak if it wanted oiling.

Leonard Skinner, a labourer in the service of Bates & Co. Construction Syndicate, was called to prove that the binding girders were bolted to the carriage girders. There was no truth in the assertion that they were tied with ropes, and that he cut them before putting in the concrete. The ordinary bolting was employed.

Charles Smith, one of the injured labourers, said he was working on a scaffold underneath the roof near the north skylight. He knew of nothing happening until the whole of the roof fell in, there being no previous warning. As to the concrete, it was quite hard. They had been removing the centring from two o'clock until 3.40, when the accident happened. He had heard no creaking or rumbling just before the collapse. He did not see any concrete being improperly mixed.—By Mr. Avory: About thirty or forty boards had been struck when the roof fell in. At that moment he was drawing a bolt.

Thomas Stewart, the foreman plumber, said he was fixing some slack pipes on the roof when he saw two men undoing the centring bolts. Then there was the sound of the crumbling of a matchbox—there was no louder than that, so to speak—and the roof fell in. The roof sank in in the shape of the letter V over an area of from 20 ft. to 23 ft. The concrete must have twisted the girders. He did not know what caused him to come to that conclusion. By Mr. Avory: In his opinion the concrete was not fit for striking. After the accident he looked among the debris and found some pieces of concrete from the roof. It was, in his opinion, not properly set, and did not contain sufficient cement. He showed some of the concrete that remained on the roof to Mr. Pawley and Mr. Simpson. It was of the same consistency as that found in the basement. That was to say, it was green and contained moisture. For that reason he said it was not fit for striking. It was not light enough in colour when it was dry, and it could be broken with the hand. Properly made concrete could not be broken in that way. The roof seemed to give way just over where the men were striking the centring, and he heard the repeated "bangs" of each floor being struck by the falling mass. By Mr. Gardiner: He could not swear that the girders did not fall before the roof. The object of the girders was to support the weight of the concrete. On the day after the accident he told Mr. Pawley what a "narrow squeak" he had had, and it was then that he showed him the sample of what he considered to be bad concrete. It was about half dry. The centring was not struck at the spot where he picked up the sample.—By Mr. Griffith: He did not say all the concrete was green; he did not see it all. He had been there all that day. He was speaking of the condition of the concrete when he saw it in the debris. He had walked across the roof two or three minutes before the collapse, and he then noticed nothing the matter with it.—Questioned by Mr. Avory, the witness said that on the morning after the accident a stone step was found depending from the hoisting tackle.—By the Coroner: There were no scaffold poles across the centre skylight for hoisting purposes.—The Coroner: That is a distinct contradiction of what other witnesses have sworn to.—The Witness adhered to his statement, adding that the job referred to was erected after the collapse. Before the accident the opening of the centre skylight was occupied by the scaffold upon which Dray was working.—The Coroner: Two carpenters have sworn most positively that the hoist was there.

Henry Alfred Penfold, a scaffolder, said he was on the sixth floor striking the scaffolding when he saw the hoist go to the front, and everything fell from the roof on to the sixth floor and from there to the basement. He heard the sound of the roof falling on the scaffold after the hoist had come down. He believed the poles forming the job were erected by the contractors for the stone work.—To Mr. Gardiner: He thought the girders fell and carried the hoist with them. He believed all the floors, with the exception of the first and the seventh, were concreted. The girders which fell had been resting on the pier which supported the roof. If the pier "buckled" it would have brought down the roof.

The inquiry was adjourned until Tuesday, when

Henry Penfold, a labourer, was recalled and cross-examined. He said he saw a template on each floor of the building. Under the concrete was a scaffold, and if the concrete fell it would bear down the scaffold a distance of 20 ft. before it could get to the sixth floor.

William Aspinall said he was working on the sixth floor, and when the accident occurred the first thing he saw was the pier wobble, gradually overbalanced, and then the concrete was left unsupported, came in with the crash, and falling on the pier bore everything down with it. The hoist was being used by the stonemasons for raising the stones of the Victoria Stone Company for the staircases, and the loads were about two or three hundredweight. He would swear the hoist referred to had no connexion with the brick pier. He saw the pier topple as if going to fall on them; but the floors below suddenly collapsed, and the pier went down with them.

Henry George Gander, a scaffolder, stated that he was working on the sixth floor scaffold by the side of the staircase which was being fixed. He was facing the pier and working the tackle of the hoist, but when the accident occurred there was nothing on the tackle whatever, nor had there been for quite seven minutes. When he saw the dust it was round the pier, which seemed to buckle up by the level of the sixth floor.—What did you think caused the pier to buckle up?—Putting too great a weight upon it and not enough support.

Edward Jellicoe, a bricklayer, was called. He said he had a contract with Mr. Rickard for the brickwork at 41, a roof without scaffolding, and 61, a roof with. That was for labour only. He did the whole of the brickwork of the south block. He worked from the plans (produced) for only a short time, after which he had others (altered). From the latter he built up to the first-floor front, and then drawings were supplied. He had nothing to do with the laying out of the ground. He saw the plans, &c., at the office of the general foreman, from whom he received instructions. That would be Andrews. The building stopped from March, 1897, to the end of July of the following year. From that date the building went on until it collapsed. He did not work on the brick pier himself. The wall was built first, the footings being put in for a 2 ft. 8 in. wall; but the wall was reduced from off the top of the footings to 18 in. When it was scaffold high (4 ft. 6 in.) there was an alteration, and the end of the wall was pulled down. The pier was five bricks by two and a half bricks, and went up to the level of the fifth floor, from whence he reduced the pier to 3 ft. 9 in. by 1 ft. 10 in. This went up to the roof. He altered it after consulting Mr. Andrews, who agreed with him that the pier would be stronger built that way. If he saw an alteration in the plans necessary he would mention it to Mr. Simpson, the assistant architect. Three girders ran from each floor to the pier. The 24 ft. girder was bedded on a template, which was 6 in. each way less than the size of the pier, and had a bearing of from 16 in. to 18 in. on the pier. On the part of the pier not covered by the principal templates was another template, 10 in. binder, which rested on the flange of the girder. Six large templates were used. Where the bricks came from was not his business. Hard stock bricks were used and cement, not mortar. He did not know where the bricks came from, but no soft bricks were used in the construction of the pier. He had nothing to do with the pier after taking it up to the roof. It was not true that part of the pier was erected on a template. He thought Andrews' memory had failed him. On the day of the accident he was on the roof of the north block, and saw two carpenters running, after which the roof fell in—it caved in. He attributed the collapse to the fact that the concrete was not properly set, and that when the centring was removed the whole sheet of concrete between the two lacing joists, 23 ft. in length, caved against the pier, and that being the weakest point the accident was the result. He thought Murrell's men were not telling the truth.—By Mr. Avory: He went on the roof on April 18, when the concrete was generally loose or unset. He had seen the concrete only half an hour before the disaster, when he was surprised to see the men striking the centring. He thought the concrete fell towards the pier, otherwise the latter would have been standing now. Had the piers given way first he must have heard it. After the accident he examined pieces of concrete among the debris, and they were perfectly soft and unseal.—By Mr. Gardiner: He judged the concrete by the tread of his feet and the colour, too. His feet did not make an impression on the concrete, which was "crumbly" on the top face. He did consider the striking of it was dangerous, and that the men's lives were in jeopardy. That was why he left the roof.—Pressed by the coroner, the witness said he might have been exaggerating when he said he considered that the men's lives were in jeopardy, but he did leave the roof because he thought it was dangerous.

Henry Sage, foreman scaffolder in the employment of the previous witness, said he noticed the building as it went up. At the time of the accident he was between the sixth and seventh floors, when he heard a crash overhead, followed by the falling of the pier. He had just passed the pier at that moment, and it was not moving then. Nothing

struck the pier that he saw. Something was coming down before the pier moved.

At this stage the case was adjourned till Wednesday, when Peter White, labourer and scaffolder, employed on the building, deposed that he saw the roof give way and falling towards the pier, which wobbled and then fell. After the accident he broke the cement with his foot. It was not set. It was not coke breeze, but simply refuse from engine-houses.—The Coroner: You say it was refuse?—Witness: Yes, I do. It was not coke breeze.—By Mr. Ellis Griffith: He saw the whole of the concrete fall. The crack in the concrete ran clean to the centre.

Mr. Edward Drury, District Surveyor, was called, and produced his notice for the inspection of the premises on March 20, 1896. Mr. Rickard called in company with Mr. Pawley. Witness examined the plans and wrote his opinion. On August 26 a question arose as to whether the building was to be used as a domestic or a public office building. Domestic buildings required a certain amount of open space, while public buildings were to some extent exempt from the section of the Building Act. The Orchard-street property did not comply with the Act, and he notified Mr. Pawley of the fact. He satisfied himself as to the thickness of the walls. He had asked to see the amended plans, and they were shown to him by Andrews. He found them correct, and they were in accordance with the Act, and consequently passed them. He did not see any detailed plans. He had no powers with regard to the building of the pier. He had no power to report even to the County Council of any danger until the building had actually been completed. He found on another examination that the Abbey Mansions were to exceed the height allowed by the limit of the Act. The building had been carried to 93 ft., and 80 ft. was the height allowed. Each story had been increased in height. He at once wrote to Mr. Rickard and asked him what he intended to do about it. He received a letter from Mr. Rickard to the effect that the building was in the possession of the Government, and was, therefore, under Section 202 of the Building Act, 1894, which exempted all Government buildings from the general provisions of the Act. He saw the building about a month previous to the collapse. The plans produced did not show the present height of the building. He had no control over the girders. Unless they carried a wall he had no power under the Building Act to compel any alteration until the girder had been put in position. He had control over the roof. The construction of the roof or of any roof above 60 ft. in height must be constructed of fireproof material. The front slope was not to be concreted; he had allowed them to put wood on the fireproof. He had never seen any designs of the roof, and would not pass a wood roof. His duties were clearly set out in Section 146 of the Building Act. He examined portions of the pier since the accident. It was built with stocks and cement, and was fairly well built. He did not notice any of the templates. Neither could he say there were many soft bricks used. He knew that some of the girders were bolted. Witness produced a piece of concrete taken on the afternoon of the disaster. It was very wet, and, of course, that would lessen its stability. He thought the concrete was properly mixed. He saw no concrete which would be broken by hand. If the girders had remained steady and in their place, he did not think the concrete could have fallen. He had made calculations with regard to the matter generally. He considered that the pier could carry six tons per foot super—about forty-five tons, but he was of opinion that it was carrying two good tons more than a safe load. There was a rule that a pier should not be more than twelve times its least thickness at the base in height. When a pier was increased to forty times its strength was reduced to one-third. A safe load in brickwork was very difficult to define, and probably no two persons would agree on the point. In calculating forty-five tons as a safe load for this pier he did not take into account the height of the pier, which was 3 ft. 9 in. by 1 ft. 10½ in., and 107 ft. high. Assuming that the pier was only twelve times the height of its least size at the base, and that it stood alone, forty-five tons would have been a safe load for it.—Mr. Avory: You will find that the building was made higher to please the Government.—Mr. Drury said that was the first he had heard of it.—Mr. Ashmead said the Commissioners were anxious to afford the Court every information in their power, and would adduce evidence on the point.—Continuing his evidence in chief, Mr. Drury said he had two theories as to the probable cause of the disaster. The first was that the concrete was struck too soon and that the concrete fell in consequence and levered the pier over, but that theory had been demolished since he had been in court. He was now of opinion that the pier gave way, but he could not explain why he thought so. He considered that the pier broke because it was not thick enough. He heard the suggestion of a stanchion in court for the first time.

The inquiry was adjourned until Thursday.

SCHOOL BOARD FOR LONDON v. DICKSEE.

This was an action heard at Westminster County Court before his Honour Judge Lumley Smith, on

<p>By F. JOLLY & CO. Hackney—Down, "St. Oswald's," f. r. 524. u.</p>	<p>Rotherhithe—234 to 266 (even), Rotherhithe New- rd., ut. 624 yrs, g. r. 314, r. 554. 8s.</p>	<p>41, 43, and 61, Gloucester-rd., ut. 60 yrs, g. r.</p>	<p>£1,800</p>
<p>By J. M. KLENCK & CO. Mile End—133 and 135, Penfold-rd., f. r. 524. u.</p>	<p>Stepney—23, Beverley-rd., ut. 71 yrs, g. r. 81, r. 101.</p>	<p>45, 38, r. 1954 22 and 24, Portland-rd., ut. 60 yrs, g. r. 254, 48.</p>	<p>995</p>
<p>By S. SINGLE. Pitsea, Essex—Main-rd., a freehold cottage and</p>	<p>Willen—14, Church-rd., ut. 71 yrs, g. r. 81, r. 101.</p>	<p>Leeds—73 and 80, Reuben-st., f. r. 274. 6s.</p>	<p>358</p>
<p>By DENHAM, TOWNSON, & CO. Camberwell—Denmarkhill, &c., f. g. r. 1304, reversion in 103 yrs.</p>	<p>Brentford, Middx.—Highest, "The Three Pigeons" p-h, f. r. 1004.</p>	<p>By RENDALL & SYMONS (at Teignmouth). Bishopstoke, Devon—"Venn Estate," 209 a.</p>	<p>9,600</p>
<p>Valmar-rd., f. g. r. 924, 178, reversion in 34 yrs, 30 to 44 (even), Coltharbour-lane, f. r. 394, 108.</p>	<p>Anley—23, Beverley-rd., ut. 71 yrs, g. r. 81, r. 101.</p>	<p>City of London—27, Wood-st. and 5, Little Love-lane, f. r. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 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976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.</p>	<p>21,750</p>
<p>By DENHAM, TOWNSON, & CO. Camberwell—Denmarkhill, &c., f. g. r. 1304, reversion in 103 yrs.</p>	<p>Stoke Newington—73, Lordship-rd., ut. 44 yrs, g. r. 84, 108, r. 854.</p>	<p>Leightonstone—Southwell-green, f. g. r. 264, reversion 88 yrs.</p>	<p>650</p>
<p>Valmar-rd., f. g. r. 924, 178, reversion in 34 yrs, 30 to 44 (even), Coltharbour-lane, f. r. 394, 108.</p>	<p>By H. J. BLISS & SONS. Bethnal Green—65 and 71 to 85 (odd), Somersford-rd., ut. 94 yrs, g. r. 454.</p>	<p>By MARK LIEBL & SON. Snaresbrook—Tavistock-rd., "Spring Lawn," f. r. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.</p>	<p>1,700</p>
<p>Valmar-rd., f. g. r. 924, 178, reversion in 34 yrs, 30 to 44 (even), Coltharbour-lane, f. r. 394, 108.</p>	<p>By H. J. BLISS & SONS. Bethnal Green—65 and 71 to 85 (odd), Somersford-rd., ut. 94 yrs, g. r. 454.</p>	<p>By TAYLOR, LOVEGROVE, & CO. Wandswoth—22, North-st. and f. g. r. 102, ut. 52 yrs, g. r. 204; also a freehold plot of land in rear.</p>	<p>850</p>
<p>Valmar-rd., f. g. r. 924, 178, reversion in 34 yrs, 30 to 44 (even), Coltharbour-lane, f. r. 394, 108.</p>	<p>By H. J. BLISS & SONS. Bethnal Green—65 and 71 to 85 (odd), Somersford-rd., ut. 94 yrs, g. r. 454.</p>	<p>By VENTMONT, BULL, & COOPER. Clapham—Larkhall Rise, f. g. r. 124, reversion in 134 yrs.</p>	<p>850</p>
<p>Valmar-rd., f. g. r. 924, 178, reversion in 34 yrs, 30 to 44 (even), Coltharbour-lane, f. r. 394, 108.</p>	<p>By H. J. BLISS & SONS. </p>		

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Laying-out Park and Recreation Grounds	Widnes Jubilee Comm. Committee	35, 10, and 5 guineas	July 1
*Exhibition Buildings	Glasgow International Exhibition	200, 150, and 100 guineas	Aug. 15

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Street Works, Hammers Yard, &c.	Bury (Lancs.) Corp.	Boro Engr. Bank St. Bury	May 21
Greenhouse, Pixville Park	Cheltenham Corp.	Cheltenham Corp.	do.
Sewer, Church Alley	Clayton-le-Moors U.D.C.	A. Dodson, Esq., Council Office, Clayton-le-Moors	do.
Two Dwelling Houses, Derwent-avenue, Holbeck	Leeds Corp.	Leeds Corp.	do.
Alterations to Schools, Hunsley	Leeds Corp.	Leeds Corp.	do.
Blue Factory, Kirkstall road, Leeds	Leeds Corp.	Leeds Corp.	do.
Five-story Warehouse, Grace street and Park-lane, Leeds	Bainbridge & Co. Ltd.	T. W. Bainbridge, Esq., 24, Albion st., Leeds	do.
Alterations to "The Bell Hotel," Glasshouse street, Leeds	P. A. Child	W. W. Child, 10, U.C.	do.
Engine House, &c.	Leeds Corp.	Leeds Corp.	do.
Additions, St. Andrew's School, Hildesley	A. F. Fildes	J. Sh. Lock, Esq., 11, Hildesley	do.
Foreman's House at Sewage Works	Leeds Corp.	Leeds Corp.	do.
Brewing, Paving, &c., Oakley-garden	Horsney U.D.C.	Horsney U.D.C.	do.
Sewer, Maxwell Hill-place, Maxwell Hill	Wakefield Corp.	W. Wakefield, Esq., 1, Wakefield	do.
Engine House, &c., Calder Vale	Wakefield Corp.	W. Wakefield, Esq., 1, Wakefield	do.
Grange (300 tons)	Wakefield Corp.	W. Wakefield, Esq., 1, Wakefield	do.
Engine Shed, &c., Rose-grove, Manchester	L. & Y. R. Co.	L. & Y. R. Co.	do.
Public Convenience, Chapel-road	Southampton Corp.	Southampton Corp.	do.
Painting, &c., Seaside House, Mail-ways	Kent C.C.	Kent C.C.	do.
Sewer, &c., Oakley, near Leicester	Leeds Corp.	Leeds Corp.	do.
Sewage Works	Leeds Corp.	Leeds Corp.	do.
Sewer, &c.	Leeds Corp.	Leeds Corp.	do.
Culvert, Wakefield road	Huddersfield Corp.	Huddersfield Corp.	do.
Additions to Convent, Bandon, Ireland	Bandon United Joint	Bandon United Joint	do.
Burial Board	Midlothian C.C.	Midlothian C.C.	do.
Water Supply Works, West Calder, Midlothian	Midlothian C.C.	Midlothian C.C.	do.
Widening Temple Hill, co. Dublin	Leeds Corp.	Leeds Corp.	do.
*Deals and Battens	Metropolitan Asylums Board	Metropolitan Asylums Board	do.
*Workshops at Hospital	St. Helena (Lancs.) Corp.	St. Helena (Lancs.) Corp.	do.
Destructive Shed	St. Helena (Lancs.) Corp.	St. Helena (Lancs.) Corp.	do.
House, Eaglescliffe, St. Helton on Tees	West Ham Union	West Ham Union	do.
500 tons Granite Balls	Middlesborough Corp.	Middlesborough Corp.	do.
Street Works, Borough-road East	Sheffield Corp.	Sheffield Corp.	do.
Houses, &c., Lumley-street, Attercliffe	Sheffield Corp.	Sheffield Corp.	do.
Shop, &c., Clarence-road, Bristol	B. Shepherd	B. Shepherd	do.
*Paving and Making up Road	Folham Vestry	Folham Vestry	do.
Additions to Schools	Ugborough (Devon) Sch. Bd.	Ugborough (Devon) Sch. Bd.	do.
Additions to Workhouse, Stow Hill	Newport (Mon) Union	Newport (Mon) Union	do.
Thirteen Woodhouses, Eltham-lane	Bishop Auckland Co-op. Soc. Ltd.	Bishop Auckland Co-op. Soc. Ltd.	do.
*Tarred Wood Paving	Hampstead Vestry	Hampstead Vestry	do.
*Swings, &c.	West London School District	West London School District	do.
Sanatorium	Hill Corporation	Hill Corporation	do.
Concreting, &c., Tursall-lane, W. Wooler	Northumberland C.C.	Northumberland C.C.	do.
Twelve Cottages, Coldwell-lane	Windy Nook Co-op. Soc. Ltd.	Windy Nook Co-op. Soc. Ltd.	do.
Police Station, Southwell	East Suffolk C.C.	East Suffolk C.C.	do.
Roof at Cattle Market	Hill Corporation	Hill Corporation	do.
*Alterations at Workhouse	St. George's in the East Guardians	St. George's in the East Guardians	do.
Sewage Purification, Timberbottom, near Bradshaw bridge	Turton U.D.C.	Turton U.D.C.	do.
Erick Tanks at Pumping Station	Sandwich U.D.C.	Sandwich U.D.C.	do.
Reading Room, &c., Talkin Village, Brampton	The Trustees of the Riverside Conservative Club	The Trustees of the Riverside Conservative Club	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Goods Warehouse, Buxbridge	G. N. R. Co. Ireland	District Engineer, Amiens-street, Terminus, Dublin	May 30
Lifeboat Shed, Carrickfergus Harbour	Royal National Lifeboat Institution	J. C. Holden, Carrickfergus	do.
House, Angharady, Ireland	R. J. Montgomery	R. J. Montgomery	do.
Chancel at Parish Church, Aghalee	Leeds Corp.	Leeds Corp.	do.
Sewer House and Shop, Kirkstall road, Leeds	Leeds Corp.	Leeds Corp.	do.
*Removal of Chimney	Leeds Corp.	Leeds Corp.	do.
Paving, Kerbing, &c., Station-road	Leeds Corp.	Leeds Corp.	do.
*Painting, Whitewashing, &c.	Chelsea Guardians	Chelsea Guardians	do.
Board Room at Workhouse	Alverthorpe Union	Alverthorpe Union	do.
Business Premises, York and Regent streets, Blyth, Northumberland	Summers' County Agricultural Assoc.	Summers' County Agricultural Assoc.	do.
Club Premises, Ripponden, Yorks	The Conservatives	The Conservatives	do.
*Workmen's Halls	Hove U.D.C.	Hove U.D.C.	do.
House and Cottages, Brynch	North Union	North Union	do.
Gasholder Tank	Southbourne Gas Co.	Southbourne Gas Co.	do.
Repairs to Breakwater Pier	Wickham Harbour Trustees	Wickham Harbour Trustees	do.
Harbour Works	W. K. Jones	W. K. Jones	do.
*Park Keeper's Lodge	Hornsey U.D.C.	Hornsey U.D.C.	do.
Sanitary Works, Lynton School	Charlton Kings S.B.	Charlton Kings S.B.	do.
Lines (700 tons)	Bristol Gas Co.	Bristol Gas Co.	do.
*Post Office, Weston-super-Mare	Weston U.D.C.	Weston U.D.C.	do.
*Electric Light Station	Weymouth R.D.C.	Weymouth R.D.C.	do.
Covered Service Road	Colne Valley Water Co.	Colne Valley Water Co.	do.
Patent, &c., 91, Richmond-road, Cardiff	C. J. Smith	C. J. Smith	do.
Houses and Shop, King-street, Cork	Dublin, Ogilvie, & Co. Ltd.	Dublin, Ogilvie, & Co. Ltd.	do.
Two Benit-dated Houses, Crom-gate, near Leeds	Leeds Corp.	Leeds Corp.	do.
Fifty Houses, Fort Estate, Lisburn	Jan. Lacey & Co.	Jan. Lacey & Co.	do.
Office, Ann-street, Belfast	H. Lavery	H. Lavery	do.
Rebuilding Licensed Premises, Standish and Wall-street, Belfast	P. & M. Bradley	P. & M. Bradley	do.
Additions to Licensed Premises, Great George-street and North Queen-street, Belfast	Mrs. G. G. G.	Mrs. G. G. G.	do.
Three Houses, St. David's Hill, Exeter	Leeds Corp.	Leeds Corp.	do.
Mission Chapel, &c., Tiverton Junction, Slope, High-street, King's Lynn	Leeds Corp.	Leeds Corp.	do.
Four Cottages, Satter Gaze, Chester	Leeds Corp.	Leeds Corp.	do.
Two Houses, Hasland-lane, Chester	Leeds Corp.	Leeds Corp.	do.
Houses, Haxall, Cheshire	Leeds Corp.	Leeds Corp.	do.
Houses, Oxwell, Berwickshire	Leeds Corp.	Leeds Corp.	do.
Houses, Gullane, N.B.	Rev. A. W. Williamson	Rev. A. W. Williamson	do.
Chapel, Treaslaw, Rhonda Valley	Leeds Corp.	Leeds Corp.	do.
House, Diamond street, Saltburn-by-Sea	Leeds Corp.	Leeds Corp.	do.
Fourteen Cottages, nr. Hunslet (Leeds)	Leeds Corp.	Leeds Corp.	do.
Church, Barmston, Lincoln	Leeds Corp.	Leeds Corp.	do.
Warehouse, Furness Paper Mills, Ulverston	S. Pollitt & Co.	S. Pollitt & Co.	do.
Three Houses, Bloomfield, Ireland	Leeds Corp.	Leeds Corp.	do.
Ten Workmen's Houses, nr. Landsfort	Leeds Corp.	Leeds Corp.	do.
*Superstructure of Buildings at Asylum	Leeds Corp.	Leeds Corp.	do.
*Painting, &c.	War Dept.	War Dept.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment	By whom Advertised.	Salary.	Applications to be in.
*Technical School Instructors (Two)	Gov. of Lagos, West	300 per an. less quarters travelling expenses	May 21
*Clerk of Works	Barnstaple Guardians	17. 10. per week	May 21
*Temporary Clerk of Works	Herts Bay U.D.C.	21. per week	May 21
*Road Foreman	Stoke-on-Trent Corp.	21. per week	May 21

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. & vii. Public Appointments, pp. xvii. xviii. & xx.

By BANKS & SON (at Folkestone).	3, 4, 5, and 5A, Church-path, u.t. 82½ yrs, g.r. 10.	£735	35, Albert-rd., u.t. 64½ yrs, g.r. 81, r. 301.	£775
Folkestone, &c., Kent—"Ashley Grange" and 25A, 27, 31 p.p. f.	38, 40, and 42, Lauriston-rd., u.t. 56 yrs, g.r. 151, r. 864.	790	51, Albert-gardens, u.t. 64½ yrs, g.r. 84, r. 301.	275
May 13—By G. B. SMALLPRICE.	2, 4, 6, 8, and 22, Holcroft-rd., u.t. 45 yrs, g.r. 151, r. 108.	1,005	239, Kilburn-lane, u.t. 79½ yrs, g.r. 81, r. 108.	700
Cranh. Hill—No. 77, r. 120, with four plots of land, f.	11 to 19 (odd), Percy-rd., u.t. 63 yrs, g.r. 161.	620	Brondesbury, — Willesden-lane, 41 Brondesbury House, and about 3 a., u.t. 62½ yrs, g.r. 80½.	2,500
Highcroft-rd., f.g.r. 151, reversion in 77 yrs.	21 to 27 (odd), Percy-rd., u.t. 63 yrs, g.r. 161.	620		
Ashley-rd., f.g.r. 80½, reversion in 77 yrs.	4 to 16 (even), St. Thomas-rd., u.t. 33 yrs, g.r. 171, r. 271.	2,700		
Shafesbury-rd., f.g.r. 151, reversion in 77 yrs.				
Regent's Park—Titchfield-ter., f.g.r. 217, u.t. 23 yrs, g.r. 101, r. 108.				
Hackney—12 to 16, Adelpi, and 10 to 14, Marian-34, u.t. 13 yrs, g.r. 254.				
90, 92, and 94, Balcon-st., u.t. 45 yrs, g.r. 111.				

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; r. for rent; f. for freehold; g. for ground-rent; l. for leasehold; e.r. for estimated rental; u. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

LONDON.—For the erection of cottages, offices, caretaker's

SE. **Parton**—£1,200 R. & E. Evans—£1,500
Canning & Mullins—£240 * Licensed—£1,500

MOTHERWELL (N.B.)—Accepted for the execution of causeways & drains for the Commissioners. Mr. Jas. M. Calum, £9 10 0
Town Hall, Motherwell, Motherwell—£1,204 19 6

NEATH—For the construction of concrete causeway reservoir &c., for the Rural District Council. Mr. W. E. Clason, Tonnadon, £1,000
£1,000 Post Office Chambers, Neath—£1,000
Messrs. J. & W. Jones, £1,000
Beynon & Co.—£45 0 0 Geo. Harris, Elton's 218 9 0
Tenders by schedule of prices.

NEWMARKET (Suffolk)—For laying, jointing, &c., three and quarter miles water-pipes, &c., for the Waterworks Company Limited. Mr. J. B. Eward, engineer, & J. B. Eward, Leicester—£1,000
T. Rowland—£1,058 8 1 S. Marco, Lim. Cam.—£1,000
E. Smith—£2,075 0 0 H. H. Barry—£1,053 0 0

NORTH ROTHE (near Conyngton).—For alterations and alterations to the house, for the Messrs. J. & W. Jones, £1,000
B. Brealley, architect—Hanley and Loek, quantities by architect—£1,000
G. Roynolds & Co. Lim. £1,200 James Heath—£1,600
C. Comes & Sons, £1,000 J. W. Worrall—£1,600
Matthew Cooke—£1,000 Joseph Worrall—£1,600
Thos. Brown—£1,000 Thomas Grace, Leek—£1,000

* Accepted.

OXFORD.—Accepted for making alterations to the "Prince of Wales" public-house, Waton-street, Oxford, and forming vaulted &c. Messrs. William Drew & Sons, architects, Swindon—£1,000
Brucker Bros. Swindon—£169

OSNOSTROT—For erecting a house at Osnostrot, Surrey, for the Geo. Abernethy, Mr. E. G. Knight, architect—£1,000
Falkner—£1,753 1 Messum—£1,000
Cole—£1,000

PEMBROKE DOCK.—For the following material and works for the water supply of Pembroke Dock, for the Pembroke Town

Council, Messrs. Fred Beesley & Son, engineers, Westminster:-	
For the supply of 1,548 tons of cast-iron pipes, and 30 tons of special castings	
Tredegar Iron & Coal Co., Ltd., £2,687 2 8	R. McLaren & Co. £2,353 15 1
Staveley Coal & Iron Co., Ltd., 8,634 3 5	Jordan, of Casts., 8,297 17 9
D. M. Stevenson & Co., 8,365 8 6	D. Y. Stewart & Co., 8,960 0 0
John Beesley & Son, Ltd., 8,514 11 0	Biggs, Wall & Roberts, 9,186 9 11
	Stanton Iron Works, 8,016 17 6

Coehane, Grove, & Co., Ltd.,	8,418 18	2	R. D. Ward	8,308 7	2
MacIntosh, Strang, & Co., Ltd.,	8,388 17	2	T. Spittle, Ltd.	7,995 7	2
				* Informal.	

For carting, laying, and jointing about twelve miles of pipe supplying and fixing sluice valves, hydrants, &c., and constructing two covered service reservoirs, each holding 278,000 gallons:—

W. Meredith	£17,005 14	2	Jas. Dickson	10,424 9	1
Wm. Jones	14,652 0	0	W. Jenkins, Ponty-pridd (accepted)	9,963 6	1
C. Powell	13,113 10	0			

For supplying and fixing three oil-engines and pumps, each capable of lifting 170 gallons of water per minute, to a height of 250 ft. through 1,632 yards of 12-in. rising main:—

Hayward, Tyler, & Co.	£2,525 0 0	Pollock, Whyte, & Waddell, Glasgow & Fifehead, & Rotherham	£1,838 10 0
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Engine Co., Ltd. 1884 13 6

Company, Mr. A. B. Hutchins, architect, 14, Victoria Street,
Westminster :—
Henry Leney, Pease.....£355

lobbies to "Fawley Arms," Beckenham-road, for Mr. G. Upward	
Messrs. Elsmore & Rutter, architects, 4, New Inn, Strand, W.C.	
Balaam Bros.	£1,021
Todd 843	Higgs & Hill £40
Edwards 864	Sheffield Bros. 640
	Henry Lacey, Penze* 59
	* Accepted.

PENZE.—Additions and alterations to 21, Beckenham-road, for the London and County Banking Company, Messrs. G. Elkington & Son, architects:—

PENMAENMAWR (N. Wales).—Accepted for the construction of road and erection of thirty-one cottages, for Messrs. Brundritt &

PORT AMLWCH.—For erecting a Calvinistic Methodist chapel
Mr. Richard Davies, architect, Bangor:—
W. Williams.....£3 11s
Thomas & Son, Port
Amlwch (accepted) 1,935
W. & O. Pritchard.....£1,800
O. Thomas..... 1,070
H. Hughes..... 1,500

Contract No. 1.—For Supply of Cast Iron Pipes.

William Jones	£1,780	9	3	Butterley Co., Ltd.,
Clay Cross Co.	1,716	3	2	Butterley Iron
Coopers & Co.	1,500	6	7	Works, near

From Co., Ltd. 1,535 4 10

Contracts Nos. 2, 3, 4, and 5.—For Pipe-laying.

William Jones	£1,962	2	9	Swindall & Moss ..	£1,217	0	0
Walter Hewitt	1,771	16	20	Robert Holmes &			
James Holmes	1,435	6	6	Co., Chesterfield ..	1,155	0	0
W. H. Barry	1,359	0	0				

* Accepted.

Contracts Nos. 3 and 5.—For Pipe-laying.

Johnson & Beighton, Dainesmore, Chesterfield ..	£962	4	2
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ST. ALBANS.—For the erection of a pair of cottages on the Combars Estate, Mr. Percival C. Blow, architect, St. Albans and Harpenden:—
Dunham £510 0 | Bushell* 449 0
Sparrow 459 10 | * Accepted.

ST. ALBANS.—For the erection of six cottages, Culver-road, for Mr. Nathan Bell, Mr. Percival C. Blow, architect, St. Albans and Harpenden:—
Whitley & Jarvis £1,304 | Bushell* 1,275
Sparrow 1,254 | * Accepted.

SHOEBURNESS.—For the erection of four cottages, Wakefield-road, for Miss Knapping. Messrs. Burles & Harris, architects, Southend-on-Sea:—
A. J. Harris £850 0 | Alp & Ventris, Shoeburyness (accepted) £809 10

SOUTHAMPTON.—Accepted for the erection of shop and dwelling-house in Shirley-road, for Mr. S. H. Foy. Messrs. Jurd & Sanders, architects, Southampton:—
Golding & Ansell £1,350

SWINDON.—Accepted for forming new roads and putting in drains, &c., at Even Swindon, for Mr. James Morrison, J.P. Messrs. William Drew & Sons, surveyors, Swindon. Quantities by the surveyors:—
J. Williams, Swindon £3,748

SWINDON.—Accepted for forming road and putting in sewer and drainage-works to small-pox hospital for the Swindon and District Hospital Board. Messrs. William Drew & Sons, surveyors:—
J. Williams, Swindon £532

SWINDON.—For erecting new premises in Bridge-street, for Messrs. Cole & Lewis. Messrs. William Drew & Sons, architects, Swindon:—
J. Williams £1,987 0 | J. Hatherley £1,177 0
W. A. Moulding 1,280 0 | C. Williams, Swindon, 2,400 0
Flewelling & Hucksion 1,205 10 | * Accepted.

SWINDON.—For making additions and alterations to the Foresters Arms public-house, Fleet-street, Swindon, for Messrs. T. & J. Arkell. Messrs. William Drew & Sons, architects, Swindon:—
J. Hatherley £1,555 0 | A. J. Colborne £1,375 10
Flewelling & Hucksion 1,473 0 | C. Williams 1,315 0

SWINDON.—Accepted for the erection of workmen's club and institute at Haydon Wick, near Swindon. Messrs. W. Drew & Sons, architects, Swindon:—
W. Chamberlaine £700

SWINDON.—For the erection of a malt-house, Belmont Brewery, Swindon, for Messrs. Godwin Bros. Messrs. William Drew & Sons, architects, Swindon:—
F. J. Liddington £596 0 0 | J. Williams £491 0 0
W. A. Moulding 556 17 6 | J. Hatherley 487 0 0
Flewelling & Hucksion 555 0 0 | A. J. Colborne, Swindon (accepted) 495 10 0

SWINDON.—For additions to the "True Heart Inn," Blapstone, near Swindon, for Messrs. Godwin Bros., Belmont Brewery, Swindon. Messrs. W. Drew & Sons, architects, Swindon:—
J. Williams £47 0 0 | W. A. Moulding, Aldershot £334 7 6
Flewelling & Hucksion 355 0 0 | Bourne* 385 0 0
Lawrence Bros. 355 0 0 | Herring 385 0 0
Lawrence & Co. 335 10 6 | * Accepted.

TONBRIDGE.—For two shops and dwelling houses, Woodspring road, for Mrs. Baldwin. Mr. Hy. Edwig, architect:—
G. E. Eldridge £750

TONBRIDGE WELLS.—New dispensary, waiting, and consulting rooms, York-road, for the Friendly Societies Medical Association. Mr. Hy. Edwig, architect, Tonbridge Wells:—
J. Jarvis £532 3 | Leney & Son £508 10
G. G. Over 514 0 |

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W. Griffiths 470 0 | J. Reeves, High-road, Walthamstow, E.C. 356 0
A. T. Catterly 450 0 | * Accepted.
Jesse Jackson 452 0 |

WESTWOOD (Notts).—For the erection of a church, near Codnor Park, for the Building Committee. Mr. F. H. Currey, architect, Market-place, Derby. Quantities by the architect:—
T. Gill & Sons £3,383 0 Estimate B.
Fisher Bros. 3,388 0 £3,405 0
H. Green & Sons 3,397 0 3,369 0
H. J. Robinson 2,810 0 2,195 0
W. Salt 2,512 15 1,811 0
F. Lee, Alfreton* 2,085 0 1,700 0
Estimate A for complete church.
Estimate B for church with tower omitted.
* Accepted.

TO CORRESPONDENTS.

W. E. W. (Amounts should have been stated).—J. A. B. (Below our limit).—J. M. (Amount should have been stated).—B. B. W. F. & G. (Too late; next week).

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ILLUSTRATIONS.

New Free Church at the Kelvin, Glasgow.—Mr. J. J. Stevenson, F.R.I.B.A., Architect	Double-Page Ink-Photo.
Public Library, Shoreditch.—Mr. H. T. Hare, A.R.I.B.A., Architect	Double-Page Photo-Litho.
Sections of Arch and Pier of London Bridge and Waterloo Bridge, showing Pier Foundation, &c. Illustrating Paper on	
"Foundations" by Mr. A. T. Walmisley	Double-Page Ink-Photo.
Illustrations to Paper on "Foundations," by Mr. A. T. Walmisley	Double-Page Photo-Litho.

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The Westminster Building Accident.

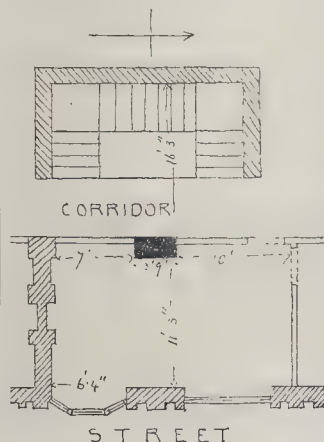


HE coroner's jury, after a long and searching inquiry into the circumstances of the recent building disaster at Abbey-mansions, by which seven men were killed, on

Thursday afternoon returned a verdict to the effect that the deceased men met their death through the collapse of the building, the cause of which was the faulty design and construction of the pier, due to the culpable negligence of the architect. The jury were of opinion that some of the concrete was not well mixed and was of unsatisfactory quality but it was not the cause of the collapse. They also recommended that greater control should be exercised over buildings (meaning, we presume, on the part of local authorities). We received the verdict just in time to insert it before going to press, and we think it well to add that the following remarks, embodying our own view of the case, were in type before the verdict was announced.

The architect's original promise to let us have a plan of the building has not been kept, at which perhaps we can hardly be surprised; but the annexed sketch plan with some figured measurements, taken from the working drawings in possession of the Coroner's Court, will enable the reader to understand better the nature of the case. The pier shaded black is the one which fell. This pier had a total height of about 105 ft.; in the basement and ground story there was an 18 in. cross wall connecting it with the front exterior wall of the building, but it is admitted that this wall was built in mortar while the pier was built in cement, so that the connexion between the two as a bond was rather theoretical than practical. Above the first floor level the pier went up for the remainder of the height, about 85 ft. as a solitary piece of brickwork, unsupported by any bond with the other walling of the building; up to the fifth floor its dimensions were five bricks long, two and a half bricks wide; above the fifth floor it was, by the suggestion of Thorp, the contractor for the bricklaying, reduced to four and a half bricks in length by two in thickness. No reference seems to have been made to the architect, but Thorp's sugges-

tion was approved by Rickard, the general contractor, and his foreman Andrews. We have no fault to find however with the suggestion in itself; it was a reasonable and practical idea to lessen the bulk of the pier somewhat as it went up. It was asserted by one witness, Collins, a mason, that the pier was actually founded on an 18-in. brick wall previously commenced in the basement, which, if true, would have been sufficient in itself to account for the pier falling under sudden or uneven stress; but this witness was proved to be so absolutely wrong in other points that this (it must be admitted) very improbable statement, contradicted by other evidence, was regarded by the Coroner, and we think rightly, as



entirely discredited. A general summary of the evidence seems to lead to the conclusion that there was nothing wrong in the foundation or construction of this pier, or in the materials employed; the question, as the Coroner put it, in his summing up, was one of design; but we may add that the question of design is complicated by incidents in connexion with the actual building which would exercise a very important practical bearing on the stability of the pier. To erect a brick pier of those dimensions to such a height with no support from other walls, was in itself an unusual and unscientific proceeding, which seems to have been carried out with a light heart merely for the sake of convenience and

saving space. But the details which gradually emerged from the evidence show a constructive carelessness which is perfectly flagrant. When the architect, after admitting that he knew it was most unusual and contrary to received theory in building to carry up a pier to such a great height in proportion to its lateral dimensions, was asked why in that case he did so, his reply was that it was because it was so well tied by the fireproof floor and of course if the steelwork of the floors had been properly connected with the pier and with the adjacent walls in all directions the floors and pier might be regarded as affording mutual support. But it appears that on the north side, where the staircase was, there were no tying girders; and that in respect to the others they were put into the pier anyhow and without any system whatever, or any proper attempt to do the job in the finest and best manner. We gather from the evidence that several of the larger steel joists which carried the main weight of the floor were inserted into the brickwork pier only 6 in. from its end instead of near the centre; that on each floor level there were templets of three different sizes inserted in the pier for taking the ends of three different sizes of joists; that these templets were not on a level with each other, nor were the ends of the joists inserted with any reference to the courses of brickwork, which was cut out wholesale to insert the end of a joist, and the overplus space filled up with a packing of broken bricks in cement. This unfortunate pier seems to have been liable to be cut about as any workman required to do it for any purpose, and however the system of filling in the girder holes might be efficient to resist compression, it will hardly be maintained that a girder so inserted is tied into a pier; as Mr. Blashill put it in his evidence, it was rather strutted than tied, and even this strutting was absent on one side (the north side) of the pier. In fact, the evidence as to this pier, taken altogether, is quite clear; it was a pier built of good materials but carried up to a dangerous height, and rendered still more insecure by heedless cutting and by the bearing of heavy weights on it in such a manner as most to impair its stability, viz.: near the ends instead of in the centre.

The evidence as to the concrete is not so clear. Two or three witnesses stated that they saw concrete being very badly and

imperfectly mixed on the ground, and some of this sent up to the roof. On the other hand, Mr. Blashill states that the engineer and chemist of the London County Council had informed him that the specimens they had tested had been very good. In the face of some of the evidence, however, we must take it, as the Coroner said, that some badly-mixed concrete got into the roof, but how much we should probably never know. There appears to be quite room to suppose, at all events that a considerable proportion of the concrete which came down was probably good enough. We have the evidence of one witness employed in striking the scaffolding, who said that the underboards were passed up to him quite clean, as if the concrete from which they had been taken was perfectly dry; and we must recognise also the force of the remark of Mr. Drury, the District Surveyor, that if the concrete were not properly mixed he should have expected to see it fall in small pieces and not in large lumps.

Every one who followed the evidence must have seen at an early stage in the proceedings that the whole question of responsibility for the accident turned on the question— which gave way first, the pier or the concrete? And this was the main point in regard to which, during the latter portion especially of the inquiry, questions were put to eye-witnesses of the disaster, viz.: what did you see or hear first? A question to which, in the case of some of the less educated witnesses, it was rather difficult to get a distinctly intelligible answer. It seems to have been generally assumed in the first instance that the concrete was in fault, especially as the failure occurred immediately after the architect had given orders to his assistant, Mr. Simpson, not to strike the centring, which order had been communicated by him to Mr. Murrell, the contractor for the roof, and by the latter in turn, according to his own account, to his foreman Parker, who appears, for some extraordinary reason, to have immediately gone and disobeyed it. This theory of course takes the responsibility off the architect, and places it on the roof-contractor's foreman or on the contractor as responsible for his foreman's actions; and naturally it has been adopted—and may in the first instance have been quite sincerely adopted by the architect, who had just given an order and thought he saw the natural consequences of its infringement. But some portions of the subsequent evidence put things in a different light. Two or three witnesses stated distinctly that they saw the pier move before they saw or heard anything else: one of the men of the Victoria Stone Company, at work on the stairs shown in our sketch plan, said "the first thing I noticed was the pier falling towards me;" exactly the direction in which the pier was not, in Mr. Blashill's phrase "strutted," and in which it would consequently fall if there were any sufficient shock to its equilibrium. It may also be very pertinently asked, if the concrete fell in through sheer weakness and want of coherence, why should it carry the supporting joists with it, instead of merely falling through them? Our conclusion is that while the striking of the centring may have had something to do with the accident, by causing an unusual shaking of the pier through the girders bearing on it, the real cause was the collapse of

the pier, which, as Mr. Blashill maintained in his evidence, was so weak through the combined influence of bad proportion and reckless cutting and filling, that a comparatively slight shock of any kind might have been expected to send it over.

The evidence in this enquiry has been remarkable for its contradictory character; some witnesses asserting exactly the contrary to others in regard to facts on which it might be supposed to be easy to form an accurate judgment; and there was a remarkable tendency, as the Coroner did not fail to remark, among the witnesses connected with each department of the work, to imply that the blame rested with some one else. The production, on behalf of the architect, of a series of drawings to show the construction of the building which proved to have been all made after the accident, and not from personal knowledge but from information vaguely said to have been received from his assistants, was an incident certainly not likely to improve his case in the public judgment. But two considerations seem specially forced upon us after going through the evidence. One is, that the official architect known as the District Surveyor is too limited in his powers. Had Mr. Drury, the District Surveyor in this case, noticed the design of the pier, and considered it to be dangerous, he could only have reported it so after the building was erected. In considering plans the Building Act only gave him power to interfere, as far as plans were concerned, with cross, external, or party walls; it gave him no jurisdiction over the dimensions or proportions of piers. This is surely, in the light of this accident, a serious omission in the Building Act, which ought to be remedied. Mr. Drury drew attention also to the fact that as District Surveyor he had no control over girders except where they carried walls.

Another point which is forced upon one in considering the whole story of this disaster as elicited in the Coroner's Court, is the ill effect on work of the present more and more unlimited system of sub-contracting, where the work and the responsibility are divided among so many sub-contractors that men hardly know to whom to go for orders, and it becomes, if not impossible, at all events increasingly difficult, to fix the responsibility for any fault or neglect of duty on the right person. And of course the less direct responsibility there is, the less care will be taken with the work. Many disadvantages in the present sub-division of work on buildings have been recognised before, but this one of divided and uncertain responsibility in matters relating to the structural security of a building is perhaps the most important of all drawbacks to unlimited sub-contracting.

NOTES.

Safety in Theatres.

MANAGERS of theatres would do well to take note of the finding of the Edinburgh Court of Sessions not many weeks back, when the proprietors of the People's Palace, Aberdeen, had to pay damages in respect to injuries received by various members of their audience on the occasion of a fire on their premises in September, 1896. The sum total of the damages was only 1,000*l.*, but the principle on which these damages were

given is of far greater importance than the actual monetary claims at issue. Lord Justice Clerk, in summing up, said "that if people invited others to a certain place, then they were responsible in a measure for their safety. It was the duty of the person giving the invitation to see that his house and appliances were such as to afford safety." This finding may entirely revolutionise the whole question of theatre safety. The next step will naturally be that the theatre-manager who has had to pay damages will try to put the responsibility on his architect's shoulders. We know that there have been cases of architects taking upon themselves the responsibility of the bad plan, though its faults were due to the instructions of the client, as the late Mr. Phipps did in the case of the Exeter Theatre fire. But after the Aberdeen decision where the question becomes one of *£ s. d.* the architect may see the matter in a different aspect. He may not even care any longer to make his theatre a death-trap without a definite written order from his employer.

"Asphalte-Granite."

THE well-known firm called the "Erstes Oesterreichisches Asphalte-werk, N. Schefftel"

have issued a circular introducing a new method of paving, for which various advantages are claimed. It consists of granite and asphalt combined in blocks by a patent process. The material has been subjected to tests at the Imperial Museum of Technical Industry; the tests were specially directed to its capacity of resisting pressure, and the wear and tear caused by horse-hoofs, cart-wheels, &c. The blocks are stated to have withstood a pressure of 160 kilogrammes to the square centimetre, whereas asphalt itself will not endure more than 6*l.* It has also been found that if the wear and tear of granite cubes from cart-wheels be represented by 10, that of "asphalte-granite" blocks will be represented by 14, and of asphalt by 32 to 35. Wood pavement of course offers even less resistance to the wear caused by traffic. It is also claimed that "asphalte-granite" is easily laid, and, like asphalt, is noiseless and sanitary; further, that it offers at once a smooth and a sufficiently roughened surface, so that there is not too much friction, while at the same time it offers a sufficient foot-hold for horses.

Report on the Health of Liverpool.

THE annual Report of the Medical Officer of Health for Liverpool is, as usual, a very

full and well-arranged one. A great part of it, however, deals with medical subjects which are beyond our scope. We notice that a crematorium has been erected in Anfield Cemetery, and steps are being taken to prevent further interments in burial-grounds within the city. In the statistics on cleansing and scavenging we are surprised to find that the water-supply of Liverpool is only twenty-eight gallons per head. The medical officer seems to be perfectly conscious, however, that this is an insufficient allowance but nothing is said about any steps for increasing it. There has been an attempt to acquire and pull down, *en masse*, a large quantity of insanitary property amounting to 890 houses, many of which are built back-to-back (a plan of this district is given), but the legal difficulties have been considerable, and so far only 383 houses out of the total have been dealt with.

Architecture

at the
Berlin "Salon."

THE architectural room at the Berlin Art Exhibition, which was opened this month, shows considerable improvement compared with what we have been used to of recent years in the German capital. It appears that the "Vereinigung Berliner Architekten" has this year had the management of the room, quite independent of the general committee of the Exhibition, and the result is that for once nearly a hundred architects are represented. But perhaps one of the most notable improvements is that the architectural room is no longer hidden in some out-of-the-way corner of the building. The collection has this year been placed in one of the principal halls, which has been specially redecorated for the occasion. It is also one of the notable features of this year's room that it contains a large number of sketches and water-colour drawings by architects, as distinct from designs for new work. As regards the latter, church architecture has the place of honour. This is only natural, at a period when the building activity of Berlin is almost entirely bestowed on the erection of new places of worship.

A Memorial Cathedral to Mr. Gladstone.

A CORRESPONDENT of the Times, "J. M." (who is careful to say that he has no connexion with Liverpool), suggests that the most suitable memorial to Mr. Gladstone would be the erection of a new cathedral in his native city, an idea which would probably have met with Mr. Gladstone's own approval. We should be glad to hear more of this suggestion, which, considering Mr. Gladstone's serious and rather High Church religious views, seems a suitable one, unless some say that it is a little too much like building a cathedral in honour of humanity rather than Divinity. At all events, the suggestion may prove an incentive towards a fresh endeavour to realise that Cathedral at Liverpool, which many people at present seem to want but which none seem ready to pay for.

Artists and Government Honours.

We observe, in the list of "birthday honours," that Mr. Tate, the donor of the Picture Gallery known under his name, has been rewarded by a knighthood, an honour which we by no means grudge him. But it is characteristic of this country that this is the only recognition of art that is made, except the knighthood to Dr. Hubert Parry the musician, also well merited; but musicians seem to be rather a favoured race in official circles, while sculptors, painters, and architects are ignored. What would be the use of Mr. Tate's gift of a gallery for modern English art, if there were no artists to produce works adequate to fill it? They "manage these matters better in France." There honours are bestowed on those who produce works of art, not on those who only pay for them.

Works for the Paris Exhibition.

A VISIT to the *Chantier* where the Paris exhibition buildings are getting into progress has nothing particular of interest at present. The two buildings on each side of what will be the main road down to the new bridge are getting up out of the ground, but show little of their architectural features as yet, especially as the French make a practice of leaving not only the carving but much of the

moulding and shaping of their stone-work to be done *in situ*, so that the masonry as first put up appears a mass of blocks impressive from their solidity and mass, but devoid of detail. In walking through the basement of the larger palace we noticed, however, an admirable piece of constructional brickwork, in the shape of a shallow dome of segmental section over one of the central spaces, with circular ringed openings formed in it, the whole one brick thick. This will all be covered up with decoration when the place is finished, and only those who saw it in shell will realise what a good piece of work it is.

Furniture in Furnished Houses.

THERE was tried last week an action by Lord Lonsdale against a gentleman who had refused to occupy Barleythorpe Hall for the hunting season on the ground that when he came to take possession it was not in the same state as when he inspected it. Lord Lonsdale, however, alleged that he had only taken away a few articles out of his private room of especial interest to himself, photographs, curiosities picked up on his travels, and so forth, and the jury gave him a verdict. The point, however, is one of a good deal of interest and importance in regard to tenancies of furnished houses. There can be no doubt as to the general principle. A tenant is entitled to enter the house in the same condition as when he inspected it. No doubt a certain latitude must be given to this rule, as in Lord Lonsdale's case. A few ornaments may be removed if they do not detract from the actual appearance of the house, but the alterations must be slight. There are some persons who let furnished houses who remove all sorts of articles after a tenant has taken a house and before it is entered, such as glass and china, old carpets are substituted for new, and so on. There can be no doubt that such conduct is a breach of the agreement. Of course, the prudent course is for a tenant to give notice in so many words that he takes the house in the same condition as when he inspected it. Then it is impossible for the landlord to have any latitude.

Home Arts and Industries.

THE excellent Institution known as the "Home Arts and Industries Association," the object of which is to encourage art-workmanship at the homes of the people, held its annual exhibition of work in the gallery of the Albert Hall during part of last week and on Monday this week. The exhibition was as good as any of its predecessors, and shows how much the Association is doing to promote artistic industry and the cultivation of taste and handiwork in many parts of the country. The articles exhibited were grouped in under the names of the localities whence they came, and we thus get also a practical illustration as to distribution of special forms of work in special localities. Altrincham has a *penchant* for wood carving, Yattendon for *repoussé* metal work in the shape of large vessels of different kinds, some of them of admirable design and execution; Leighton Buzzard and Kirby Lonsdale delight in decorative leather work in the shape of book-covers and other such objects; Chiswick indulges in book-binding, Birkenhead sends a fine exhibition of modern Della Robbia ware; Keswick follows the "Ruskin Linen Industry,"

Among the Irish exhibits, which are grouped together, are some fine bold pieces of textile work, and some admirable *repoussé* brass work—fenders especially. In most cases, we believe the designs are supplied or suggested to the workers; but where these are good, as most of them are, the mere working them out by hand implies a cultivation of taste and perception as well as of manual dexterity.

The Guimet and Galliera Museums.

To any of our readers who may be going over to Paris during the time the Salons are open we may suggest also that they will not find it much out of their way to look in at the two museums mentioned above, by crossing the Pont d'Iéna at the head of the Champ de Mars. In the Place d'Iéna a large stone mansion with a rounded corner feature, looking at first sight like the ordinary type of Paris apartment house, is distinguished by a tri-colour flag and two barbaric stone animals before the door; and this is the Guimet Museum, the internal extent of which, and the richness and value of the collection of objects of Oriental art disposed there, will prove a surprise to the visitor who judges it by its unassuming exterior. We fancy few English visitors to Paris have seen this museum, or perhaps even recollect its existence. They will find it well worth a visit. A little way down the Avenue Trocadéro, two or three minutes' walk from the Guimet Museum, is the Musée Galliera, which, unlike the other establishment, is worth a visit rather for the building itself than for what it contains. It was originally built to contain a collection to be given to the City of Paris, about the acceptance of which there was some ungracious hitch or other, and the Municipality (as before mentioned in our columns) have adopted it as their own art museum, though there is little in it yet except some fine tapestries and five or six pieces of sculpture placed in the gallery. But it is a fine and almost unique example, in these days, of a museum building designed for sumptuous architectural effect regardless of expense, and in this respect must be seen to be thoroughly appreciated. A view and plan of it were given in the *Builder* of January 6, 1894. In some respects this fine building has been very badly treated by its official proprietors; the three great arches in the front, which were intended to be open to the corridor, have been filled up in the most ungainly manner by barred windows, completely spoiling the monumental aspect of the building, and the graceful columned porches at the sides (shown in our view just referred to), are disused and the doors shut up, a notice directing the public to go round to the other side. The entry there is equally dignified, through a large gateway and a semi-circular sculpture court, but the architectural ideal of the building has been seriously injured by the way in which it has been treated.

The Royal Scottish Corporation.

WE are informed that at a recent Court the Governors adopted a scheme prepared by Mr. J. Macvicar Anderson, Honorary Architect to the Corporation, for building a new hall and offices upon the site of some adjacent decayed property, owned by them, in Fleur-de-Lys-court and Fetter-lane, next west to Newton Hall, which they leased, in 1881, to the Positivist Society. The present

Scots' Hall, at the north end of Crane-court, Fleet-street, was built in 1879-80, by Professor Donaldson, being his last architectural work, in place of that (by Wren) destroyed by fire two years previously, when Zuccheri's portrait of Mary Queen of Scots, and Wilkie's of George IV., perished in the flames. The first "hospital" stood in Blackfriars; in a plan of 1750 it is marked as lying between the Fleet and the King's Printing House—now the *Times*' offices. In 1782 the Corporation purchased from the Royal Society the house, built (or altered for them) by Wren, in Crane-court, together with Newton Hall at the rear, which the Royal Society had bought for 1,450*l.*, and into which they removed from Gresham College in 1710. At Crane-court* are preserved a drawing of the interior of Wren's hall and the reputed presidential chair of Sir Isaac Newton; there are also some pictures, recently presented by Mr. Sellars, of Westminster Bridge, the Horse Guards Parade, Northumberland House, and York Buildings, with riverside views of London and Greenwich, in the last century. Newton Hall, used by the Royal Society for their library and museum, was built in the garden of a house in Fleur-de-Lys-court that had belonged to the Barebone family, who owned other property in the neighbourhood.

EMPLOYERS' liability with regard to workmen's compensation has been vastly increased by the Act of 1897, if we may judge by the tariff of charges for insurance issued by the leading insurance companies; employers connected with the building trades will be astounded by the enormous increase in the rates demanded. The premium of 3*s.* per 100*l.* paid in wages, which was the rate for insurance against claims made by carpenters and joiners under the Employers' Liability Act, 1880, and under Common Law has been raised to 32*s.* 6*d.*; where circular saws are not used, the new rate is 20*s.*, against the old 2*s.* The new rate for saw-mills is fifteen times as large as the old. The rates for insurance in the building trades generally have been raised as follows:—

Brickmakers	...	...	from 3 <i>s.</i>	to 30 <i>s.</i>
Builders and building trades	...	...	" 5 <i>s.</i>	to 37 <i>s.</i> 6 <i>d.</i>
Carpenters and joiners (shop only)	...	...	" 2 <i>s.</i>	to 20 <i>s.</i>
Carpenters and joiners (with circular saws)	...	...	" 3 <i>s.</i>	to 32 <i>s.</i> 6 <i>d.</i>
Contractors (dock, pier, harbour, &c.)	...	...	" 7 <i>s.</i>	to 70 <i>s.</i>
Masons	...	...	" 4 <i>s.</i>	to 37 <i>s.</i> 6 <i>d.</i>
Masons (monumental, yard only)	...	...	" 3 <i>s.</i>	to 20 <i>s.</i>
Painters, plasterers, and decorators	...	...	" 4 <i>s.</i>	to 37 <i>s.</i> 6 <i>d.</i>
Plumbers	...	...	" 2 <i>s.</i> 6 <i>d.</i>	to 37 <i>s.</i> 6 <i>d.</i>
Saw-mills	...	...	" 4 <i>s.</i>	to 60 <i>s.</i>
Slaters	...	...	" 6 <i>s.</i>	to 50 <i>s.</i>

One result of these high rates will probably be that employers will prefer to take the risk themselves, and trust to luck and careful management to prevent accidents. The better way will be to pay the rates demanded, and to exercise such care that accidents may occur less frequently. If this be the case, undoubtedly the rates will be reduced; but it is difficult to believe that

* Formerly 2, Crane-court; the home in their early days of the Society of Arts, the *Traveller*, *Illustrated London News*, and *Punch*; also of Dryden Leach, the supposed printer of Wilkes's *North Briton*, No. 45. On No. 4 is a stone carved with "T. C." and "1670."

Mr. Chamberlain's estimate of an increase of only 5*s.* per 100*l.* paid in wages will ever be realised.

A "FIRE-RESISTING" curtain, erected by Messrs. Merryweather, has just been put up at this theatre. This curtain has, we believe, been put into position at the instance of the Bedford Estate, the County Council, of course, having no power to enforce the adoption of such appliances in an old theatre. But the Bedford Estate surveyors have not shown much knowledge of the subject, for they have apparently overlooked the fact that large fire-resisting curtains, if not properly stayed at right angles to the opening, are liable to be blown out into the auditorium the moment the expansion of air created by fire on the stage makes itself felt. The fire-resisting curtain is no doubt essential in a modern theatre, but it seems a pity that so much money should be expended without the most elementary knowledge of what a fire on a stage actually does. Drury-lane would certainly have been better without a curtain than to have one which will only create unmerited confidence. As a mere matter of detail, it also appears to be rather crude to have a curtain of this description pulled up in the "flies" and lowered from a point on the "opposite prompt" side of the stage, from which the safe retreat for the man working the curtain would be doubtful. Should a fire chance to break out on that side of the stage its working would even become impossible. The management of the theatre should be congratulated for its ready acquiescence to pay for any improvements intended to lessen the risk of fire. But we here again have an instance of money misapplied.

THE exhibition of the works of the three Vernets at the Ecole des Beaux-Arts is now open. Joseph Vernet was chiefly noticeable as a sea-painter, and painted pictures of many of the seaports of France (one of these found its way to a Burlington House loan exhibition a good many years ago). His son Charles painted battles and sporting scenes, and also drew caricatures, examples of which are also exhibited. He was the father of Horace Vernet, the best known name of the three, who died in 1863, and was celebrated for his large battle scenes, especially the "Prise de la Swala," now at Versailles. From the point of view of the present day it must be admitted that much of his work is of very doubtful value, and his old reputation can hardly be maintained. Among the works exhibited is a Review of the Imperial Guard by Napoléon (lent by the Emperor of Russia) which is simply a bad picture of leaden soldiers and wooden horses. The Czar has lent also a large picture representing his grandfather Nicholas I. and his family in mediæval costumes, a work which is little less than absurd. But by the side of these official works are some better things; an interesting sketch for the well-known picture "The Defence of the Barrier of Clichy," and a certain number of slightly executed portraits, that of Canrobert especially, which display great facility in this class of art. But the exhibition as a whole has proved a great disappointment. The receipts are to go towards a monument in Paris to the three painters, who were all Academicians.

THE Fifth Summer Exhibition of this Society, composed of artists living in or otherwise connected with Hampstead, is now open at the Hampstead Vestry Hall; the private view took place last Saturday. The exhibition is an interesting one, and includes some works of exceptional quality, such as Mr. Aumonier's "Old Shoreham Mill" (43), Mr. Loxham Browne's "A Summer's Morn" (45), and Mr. A. Withers's "In Whillinghame Wood" (25). Among smaller works we noticed especially "A Sketch, North Devon" (14) by Mr. F. Dicksee, remarkably true to the character of that coast; Miss Hickson's "Clouds that Pass" (76); Mr. A. Maclean's exceedingly bright and free little studies "The Stack Yard" and "A Bend in the River" (81, 89), and "Heath End, Hampstead" (158) by the Hon. Secretary, Mr. P. L. Forbes, who has made a number of illustrations of portions of Old Hampstead which have either disappeared or are only too likely to disappear, of some of which we shall publish some illustrations shortly.

THE collection of drawings by Cosway, Downman, and some less known artists of their school and period, at the Society of Fine Arts Gallery, forms a very good illustration of that type of work, the popular interest in which at present is based, we venture to think, more on fashion and on a revived interest in the period to which they belong, than on grounds of artistic judgment. Cosway is pretty enough now and then, but it is a *fade* type of art and of little intrinsic value. The things with most character in them are a portrait of Lord Euston by Downman, and one of Mrs. Thrale with no artist's name attached.

THERE is an extensive demolition going on at the north side of Holborn, on each side of Southampton Row; the District Post Office nearly opposite the Holborn Restaurant being a portion of the buildings which are being pulled down, we presume with the intention of rebuilding it in a style more worthy of the situation. This is a very narrow and a very crowded part of Holborn. It is to be hoped that the opportunity will not be lost of commencing to provide for the widening of this important thoroughfare, in this its narrowest part, by compelling the setting back of the line of the new buildings. It is an important public improvement urgently needed, and the opportunity for initiating it ought on no account to be lost.

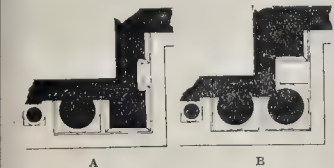
CONGRESS OF FRENCH ARCHITECTS.

THE Annual Congress of French Architects will open (as already mentioned in our pages) on Monday June 20, the first meeting being fixed for 9.30, in the Hémicycle des Beaux-Arts. At 2 p.m. on the same day there will be a visit to the Pasteur Institute (M. Girault, architect), to the Abbatoirs on the left bank of the Seine (M. Moreau), and to the Bouicaut Hospital (MM. Legros *père* and *fils*). In the course of the excursion there will be a halt made at the new stables for the Bon Marché (M. Boileau), and before the Lycée Buffon (M. Vaudremer). On Tuesday the 21st there will be the ordinary meeting, as before, at 9.30, and at 2 p.m. a visit to the Opera Comique and a promenade of part of Paris, with an inspection of some of the recent street façades by MM. Magne, Breffendille, Plumet, P. Wallon, Vaudremer, and Peronne. On Wednesday, the 22nd, at 9.30, there will be a visit to the *chambers* of the 1900 Exhibition (the large and small palaces

and the Pont Alexandre III. The same day, at 2 p.m. a paper will be read by M. Lucien Magne, on industrial art in ceramics, glass-work, &c. On Thursday, June 23, excursion to Melun and to the Château de Vaux-le-Vicomte. The morning of Friday the 24th will be devoted to the affairs of the "Caisse de Défense Mutuelle," and at 2 p.m. M. Guadet will read a paper on the life and work of the late M. Giniain. The paper will be followed by a series of reports on the Art Industries of the Departments. Lastly, on Saturday the 25th the morning will be devoted to the consideration of various questions, among others to a communication from M. Blondel, President of the "Société d'Assistance Confraternelle des Architectes Français"; at 1 p.m. will take place in the Hémicycle des Beaux-Arts, the usual distribution of "Recompenses" awarded by the Société Centrale; and in the evening, at 7 p.m., the usual closing dinner at the Hôtel Continental.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

BEFORE considering some of those designs which we have not yet noticed, we must refer again to the model and drawing of Mr. Mountford's Technical Schools at Liverpool, concerning which we remarked in our first article that the rustication of the columns in the model seemed unsatisfactory, the columns looking too much as if they were enclosed in a cage of squared blocks. We learn from Mr. Mountford, since then, that the model at this point is not accurate, and that the drawing (which, we observed, looked better than the model in regard to this detail) represents the design more accurately. The outer column in the model should have been shown as a square plaster, with the column closer up to it, the difference between the feature as shown in the model and as it will be executed being indicated by the accompanying sketch plans, B being the plan



of the angle as in the model, A the plan as it is intended to be carried out. This will make all the difference in the appearance, and will do away with the bad effect which led to our criticism on the model.

Among the drawings, we may commence by considering some of the designs for churches which we have not previously noticed. Church designs are proportionately rather numerous this year, and some of them show some new suggestions in plan and treatment. We will take the drawings in the order of hanging. Messrs. Bromet & Thorman exhibit a rather original plan and design for a "Proposed Church at Barnoldswick" (1,596). This is shown in a boldly-executed line drawing, with a small plan attached. The church is almost exactly square on plan, divided into three equal aisles and one narrow passage aisle on the north side, with a tower at the north-west corner. The main aisles are evidently intended to be roofed with three equal roofs (Devonshire fashion), making three gables at the west end, only one of which is shown on the perspective drawing, which is mainly occupied with the tower. The latter is treated with one octagonal (staircase) turret and three square turrets, which rise high above the corbel table and are connected by a horizontal arched buttress flying across the space, while within the turrets and buttresses is an octagonal lantern. The effect of this is bold and original enough, but the sides of the tower are too much cut up with windows of nearly the same size (though differing in design) all the way up; there seems to have been a want of certainty as to the motif of this portion of the design, as if it had been too hurriedly filled up.

Mr. Temple Moore's "Interior of St. Mark's Church, Mansfield" (1,642) is one of several examples which show how architects are looking for some new effect in Gothic church architecture (or architecture based on Gothic, rather) by discarding moulded detail and aiming at extreme simplicity. This is a church with

plain square piers in which the jointed stone work is exposed, with a slight cap-moulding at the top, over which the arcade is formed with white plastered or cemented walling, with a plain soffit to the arches; the piers are connected with the outer walls, at the other side of a narrow passage aisle, by stone walling with a round-arched opening or door from one compartment to another, and the compartments arched over with plastered pointed arches with flat soffits. All this is somewhat heavy and bald-looking, but there is a novelty of effect about it, particularly in the contrast between the masonry surface of the lower portion and the unbroken white surface above; but it must be admitted that it looks rather like a caprice, or as if it were an old church to which alterations had been made in a different manner from the original portion. Mr. Skipworth exhibits the side elevation of his competition design for Cockington Church (1,650), with a great deal of delicate and original treatment in detail, especially in the upper portion of the small turret towards the east end. Mr. Skipworth's manner of treating Gothic detail is well known to our readers, from various illustrations published from time to time in our pages. The same architect also exhibits a design for a chancel screen for All Saints, Fulham.

Mr. Champneys's "St. Luke's Chapel, West Hampstead" (1,655) is a pleasing piece of modern Gothic, with traceried windows in the central portion and an aisle with small square windows and buttresses standing free of the walls and connected with them by pointed arches dying into the wall. At the angle of the building is a thin octagonal turret ending in a low-pitched ogee roof. We may notice that this octagonal turret with a low-pitched roof is becoming, in one form or another, a common feature in church architecture; it recurs in several designs in this room. Spirelets and pinnacles are going out. In Mr. Arthur Marshall's "Proposed Roman Catholic Church, Nottingham" (1,660) it is present, this time with a flat-lined low-pitched roof or capping. In this design the exterior of the passage aisle is an almost entirely unadorned piece of walling, with the equally unadorned arched buttresses descending upon it, without a moulding or feature of any kind. This growing passion for excessive plainness is a kind of reaction against the habit of imitating mediæval mouldings and gables; it is carried rather to the extent of affectation. Possibly it is thought that a first step towards new detail in church work is to obliterate all the old; at all events, things seem tending in that direction. In Mr. Reynolds's "Design for a Country Church on a Hill" (1,668) the stern massiveness of the walls of the tower, with their battering lines, is in keeping with the object of the design—a church on a hill requires massive and fort-like character; that it should be shaded so as to look as if it had been a rough-cast or cemented tower with the covering all peeling off at one of the lower angles is, we presume, only one of the little jokes of modern architectural draughtsmanship.

Mr. C. A. Nicholson's "Studies for a new church for South London"—interior and exterior (1,666, 1,700), are of considerable interest, as they represent an effort to treat effectively a church on a very irregular angle site, with a piece cut out of it at one side. The plan is treated in two aisles, the outer line of one of them converging towards the centre line of the church, marked by a central arcade, and where the opening of the chancel arch should come is a solid pier, with an opening on each side of it leading up to the chancel. The interior here again is studiously plain and unadorned, to which we have no objection; but we do not see the point of carrying up the flat buttress in front of the chancel to be stopped by the roof in a kind of accidental way, as if the roof were a later one put on to more ancient walling. An incident which would look interesting and characteristic in an ancient building becomes an affectation when it is "done on purpose" in a modern building. The exterior design shows a plain brick church with stone traceried windows. The same architect's "St. Alban's New Church, Southend" (1,705) is another ostentatiously plain interior, with square piers with a capping of the section of the very earliest Norman abacus—a broad fillet and a bevel; in the plan, which is of the normal three-aisled type, we observe the suggestion of placing the pulpit against the middle pier of the north arcade, half way down the church. This would be altogether excellent if it were not that people have an ineradicable

fancy that they can hear a preacher better if they see him, and half the congregation would turn round in an uncomfortable attitude during the sermon, if the pulpit were behind them.

Mr. Poynter's "Proposed Church, Burton-on-the-Wolds" (1,694) is an example of an exceedingly simple red brick village church, with a red tiled roof and stone traceried windows, suitable for a country district; we may notice with approval that a plan is given to the same scale as the elevation. Mr. Martin Cappon, on the other hand, gives no plan whatever with his line perspective of the "Church and Presbytery for St. Patrick's, Dundee" (1,709), wherefore there is nothing to show the meaning of the two projections from the side of the nave, with their ogee-shaped copings. The general treatment of the building is good, but the louvred octagon lantern over the angle tower is too low for its height, and consequently looks as if sinking into the tower. Messrs. Mallows & Grocock exhibit an effective though slight sketch in coloured chalks of their design for a "Proposed New Church at Bedford" (1,713); the treatment of the upper portion of the tower, with canted faces forming a kind of oriel window between the square angle turrets, is picturesque and effective. Messrs. Jas. Brooks & Sons "St. Luke's, Enfield" (1,716) is not done the best justice to by the rather hard mechanical line drawing in which it is shown; the treatment of the flèche, in unusually broad proportions and rising off a large base in the roof, is effective; on the other hand the saddle-back tower, standing nearly free of the church, strikes us as rather tame in design. An original and interesting study is shown in Mr. Greenslade's very miniature drawing of the west elevation for a town church (1,723), which ought to have been hung on a level with the eye, considering the minuteness of the work. It shows lofty masses of turret at the angles, perfectly plain up to the top, where there is a decorative story, and two great long lancet windows with a massive centre pier between them; the two entrance doors below are comparatively low in proportion, with segmental arches, and over them and connecting them is a decorative tympanum composed of niches and sculpture which looks well on the whole, though one cannot make out the detail. The outline of the centre turret or flèche appearing over the gable looks rather ragged and awkward, but this little drawing is a distinctly original bit of work, and the design is exactly in keeping with what it professes to be—a street front to a town church.

Mr. Percy G. Stone's drawing of "New Roof and Screens, Church of St. Peter, Shorwell" (1,737) shows a section through a triple roof over three equal aisles, the centre roof being treated in a more decorative manner than the others, with a crucifix on the centre of the tie-beam and stooping figures of angels under the braces at the two ends of the tie-beam. The chancel screens, of wood and of Late Gothic type, are shown in elevation. Under the ends of each of the tie-beams are carved symbolical heads as corbels; two of these we shall be able to give on a larger scale, as details, when we publish the illustration of the drawing. This is a very good piece of work, as an addition to an ancient church. We next come to an interior of a mausoleum, by Mr. J. L. Williams (1,761), which owes a good deal of its effect to the excellent watercolour drawing signed by Mr. C. A. Nicholson. It shows a dome on pendentives, and an entablature with two columns under one side of it, fencing in the central space; on the adjoining side is a tomb with a recumbent figure with an arch hanging over it without any visible means of support, as it springs from a horizontal soffit also overhanging the tomb. This does not look very constructional; but the decorative and sculptural details are well put in, and the whole work has a very good effect in the drawing.

Mr. E. B. Lamb's "Design for a country church" (1,793), shown in a watercolour of some originality of style and colour, is an effective piece of architectural grouping based upon a rather unusual plan, having a square central area with a morning chapel attached to and projecting from its south side, and an arched entrance passage projecting beyond this and at right angles to the axis of the nave. The square central area is carried up forming a large mass of walling in the centre of the building, with a hipped roof rising from behind the parapet walls. There is a distinctly marked character about this design. The perspective view of Mr. Mount

ford's Church of St. Michael, Southfields, (1,802), shows a solidly treated church with a massive battlemented tower and an east end flanked by that kind of low-roofed octagonal turret which we have before referred to as a recurring feature in recent church design. The church was illustrated in the *Builder* for July 24, 1897. Messrs. Clark & Moscrop's "New Church, St. Luke's Parish, Darlington" (1,803) is a pleasing and well-proportioned piece of modern Gothic, with some original touches here and there, but which no doubt owes something to Mr. Raffles Davison's effective and picturesque drawing.

THE ARCHITECTURAL ASSOCIATION: FOUNDATIONS AS APPLIED TO LONDON BUILDINGS AND RIVERSIDE FOUNDATIONS.

The last ordinary fortnightly meeting of session 1897-98 of this Association was held on Friday, last week, in the Meeting Room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. Hampden W. Pratt, President, occupying the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the Association:—Messrs. E. E. B. Claypole, W. H. Hobday, C. S. Sanders, and W. H. Ansell, and Messrs. G. Vernon and M. Zimmermann were re-instated. On the motion of the Chairman, Mr. E. T. Hall was also elected a member.

On the motion of Mr. G. B. Carvill, junior hon. secretary, a vote of thanks was accorded to Mr. Ernest Runtz for allowing members to visit on the 7th inst. the Crown Theatre at Peckham, and for his hospitality on the occasion; and to Mr. J. Dixon Butler for allowing members to visit the new police-station at Camberwell on the same day.

The Chairman then announced the award of the Travelling Studentship. Three sets of drawings had been sent in, and the Prizes Committee had selected the set submitted by Mr. H. F. Waring, and that selection had been confirmed by the committee.

Mr. A. T. Walmisley then read the following paper, entitled "Foundations as applied to London Buildings, and Riverside Foundations."

There are few subjects with which an architect has to deal which involve the consideration of so many points of detail as the subject of foundations. It involves a knowledge of the applicability and the durability of various materials, experience in drainage, and not infrequently an acquaintance with contractors' plant as well as the best way of economically distributing structural loads, for which expert knowledge engineers are usually given credit. Hence there may be some reason for the honour paid by your Council to an engineer in the invitation given to the author to read a paper upon foundations.

The subject has already been ably treated in the "Student's Column" of the *Builder* for January to June, 1886, and these articles, with which you are doubtless familiar, may be treated as preliminary to the author's paper.

The variation in London soils and subsoils is well described in a pamphlet written by Mr. Horace B. Woodward, F.R.S.* So much of the top soil with which foundations are concerned is of an artificial character, that only actual excavation can determine the true nature of a site. Geological maps furnish standard information respecting the natural lower strata, but possess very little value as regards the mixed character of the top soil.

Made ground may be a foot to 25 ft. or more in thickness. At the Bank of England there were 22 ft. of made ground resting upon 4 ft. of gravel. Some of the made ground is of ancient date, and preserves relics of Roman occupation, but in some parts the subsoils have been excavated for ballast or gravel as at Kensington, or for brickearth as at Highbury, and the pits filled in with rubbish.

A rock which forms an excellent and unchanging foundation in one situation may prove a dangerous foundation in another. Thus, chalk forms a good limestone foundation in certain positions, but when it dips towards a slope or a cliff, with an outcrop of the gault or other underlying clay, it is a very unsuitable foundation for any building, as the landslips of the Isle of Wight and of the Dorsetshire coast bear witness. Chalk also is subject to dissolution by the action of carbonated water,

whereby comparatively wide cavities become formed in its surface, which may be wholly or partially filled with gravel and sand, and cause inconvenience. In the same way for a building to be partly on gravel and partly on clay or brick-earth, to be on or over the margin of an old excavation since filled with rubbish may lead to trouble. Where foundations are carried down into clay, the excavation may form a tank, into which the water from surrounding gravel may accumulate.

The variations in the upper soils of the metropolitan area may be illustrated by the following records:—At the Chelsea Barracks, boring through made ground and running sand shows the clay to vary in depth below Trinity high water level, which is 12 ft. 6 in. above Ordnance datum.

In 1895 a return of the burial grounds in the County of London, with a statement of their size, ownership, and condition was prepared for the London County Council by Mrs. Basil Holmes, from which it appears that there are 362 burial grounds existing in the County and City of London, of which 321 are disused. Of this number 90 are employed as public recreation grounds, and the remainder are closed. Prior to the passing in 1884 of an Act to prevent the erection of buildings on burial grounds, about 100 to 150 graveyards had been entirely built over, appropriated as sites for railways, or annihilated by new roads. Her Majesty's Stationery Office Waste Department stands on a site in Earl-street, Westminster, formerly used as Hartley's marble works, but originally the site of the plague-pits connected with the Tothill-fields pesthouse, of which area Vincent-square now remains open as the playground of Westminster. The pesthouses erected in 1642 were not removed until this century. Charterhouse-square, Holborn, is also a part of the site of a burial ground, dating back to the fourteenth century, for the burial of those who died in the plague of that time. In the County of London the only encroachment now permissible on a disused burial ground is the enlargement of an existing place of worship, although in the City the Commissioners of Sewers have the right, under certain circumstances, to appropriate portions of them for the widening of roads. There are excavations in the metropolis in which human bones have been discovered on sites which have been dug out, and then filled in with debris from disused burial grounds adjoining, when the latter were used for building, before the passing of the Disused Burial Grounds Act (47 & 48 Vict.). The above report, which is accompanied by a map, definitely fixing the position of old burial grounds, is therefore of great value.

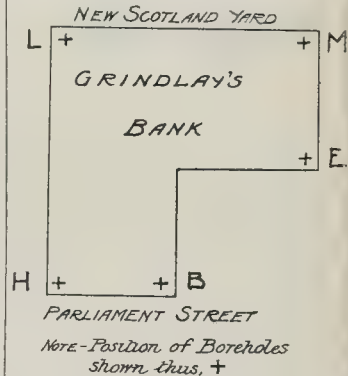
A boring made in Tallis-street, on the Victoria Embankment, showed the following strata:—(1) 1 ft. 6 in. ballast, dirty; (2) 6 in. green sand, wet and dirty; (3) 2 ft. peaty clay; (4) 6 in. green sand; (5) 5 ft. 6 in. peaty bog; (6) 9 ft. running sand; (7) 4 ft. clean ballast resting at a depth of 23 ft. below the ground line upon blue clay. A boring at Highbury New Park gave (1) 2 ft. made ground; (2) 18 ft. loam; (3) 9 ft. sand; (4) 4 ft. peat; (5) 8 ft. gravel and sand. A boring at Peckham gave (1) 3 ft. gravel; (2) 14 ft. loam and sand; (3) 3 ft. gravel. At Kensington, the soil is described by Mr. W. Bennett Rogers, in a paper read before the Institute of Estate and House Agents, "to be mostly a rich dark loam; secondly, a silicious gravel from 5 ft. to 10 ft. in thickness; and, thirdly, a strong leaden-coloured earth known as blue clay."

The foregoing observations show that while trial bore-holes should always be made before designing a foundation, to ascertain the character of the subsoil, care must be taken not to calculate upon uniformity. Thus at the Admiralty extension new buildings forming block 2, now in course of erection by Messrs. John Mowlem & Co., one of the bore-holes upon the south-west side of the old buildings showed the clay to be about 29 ft. 6 in. below the surface of the ground, while actual excavation proved the dip of the clay to be such that in the execution of the new building it became necessary to underpin the north-west corner of the old building at the deepest part, 42 ft. below the ground. The strata in the bore-hole referred to gave about 18 ft. (average) made ground, 2 ft. ballast, 5 ft. dirty sand, 2 ft. 6 in. clean sand, with 2 ft. running sand and slurry, making a depth of 29 ft. 6 in. to the clay. The old walls of the Admiralty premises were found to be built upon oak sills. These were removed where underpinning was necessary, so as to

build and pin up with solid brickwork. There being two floors below the ground in the new building, a concrete retaining wall has been constructed completely round the exterior below the ground and joined up to the underpinning work; the whole site being covered with concrete 6 ft. thick, thus forming a huge tank of an average inside clear depth of 20 ft., in which the basements are built. The underpinning to the old wall consists of brickwork 4 ft. 3 in. thick and 14 ft. to 20 ft. deep, below which concrete 6 ft. deep, with set-offs of 12 in. on one side are inserted to a width of 5 ft. 3 in., for the upper portion of 3 ft., and a width of 6 ft. 3 in. for the base or lower portion of 3 ft. Messrs. Leeming & Leeming are the architects, who also designed block No. 1 forming the new Admiralty buildings facing St. James's Park, the foundations for which are likewise somewhat appropriately placed in a dry dock built upon the London clay at a depth of 30 ft. in solid concrete 6 ft. thick.

The diagram (see lithograph) illustrates the distribution of pressure in the foundation to the Nelson column, Trafalgar-square.

At the Hotel Victoria in Northumberland-avenue, Mr. Henry L. Florence, the architect, states that this building has a frontage of 300 ft.; 38 ft. 6 in. made ground clay and gravel mixed, 4 ft. gravel and sand, 6 ft. rising sand, 2 ft. fine ballast, and at a depth of 50 ft. blue clay. At the south end the clay was 43 ft. down. At the north end 37 ft. The front wall was constructed on a concrete bed 9 ft. wide. Another bed 15 ft. wide carries the two walls of the central corridor. The whole site was surrounded by a similar wall of concrete, about 6 ft. wide, forming a species of boxes, and the whole covered with a depth of 6 ft. of concrete, upon which the walls were raised. The spaces between are now probably full of water. At the Grosvenor Hotel, Piccadilly, there were 4 ft. of made ground overlying 11 ft. of alluvium, and 9 ft. of sand and gravel. Messrs. J. Grover & Son, Wilton Works, New North-road, N., forward the accompanying description of bore-holes made in Parliament-street before starting the trenches. The bore-holes were taken at the corners, as in sketch (see plan).



The foundations are Portland cement concrete and go down to the ballast or to the London clay as described. The concrete was 6 ft. and 5 ft. wide under external walls and 4 ft. under the interior walls. The site is that of an old creek that ran up to Scotland-yard. When Messrs. Grover were building New Scotland-yard they came across old wharves and barges at about 30 ft. below the level of the Embankment. As the water from the land still finds its way through the old channel, the foundation required the aid of pumps.

BORINGS AT MESSRS. GRINDLAY'S BANK (SEE PLAN ATTACHED).

All depths are measured from basement floor level 22 ft. below pavement.

The water in all holes, except E, rose 15 ft. from surface. In Bore-hole B, made ground, 2 ft.; blue clay, 4 ft.; peat, 3 ft. 6 in.; blue clay, 4 ft.; loam, 1 ft. 6 in.; fine sand, 2 ft.; coarse sand, 1 ft.; loam, 1 ft.; ballast, 7 ft.; total, 26 ft. In Bore-hole H, made ground, 2 ft.; blue clay, 6 ft.; peat, 3 ft.; blue clay, 4 ft.; peat, 2 ft.; fine sand, 2 ft.; coarse sand, 3 ft. 6 in.; ballast, 6 in.; total, 23 ft. In Bore-hole E, made ground, 2 ft.; blue clay, 6 ft.;

* Reviewed in the *Times*, January 14, 1898, and more completely reviewed in the *Builder*, February 12, 1898.

2 ft. 6 in.; blue clay, 4 ft.; loam, 2 ft. 6 in.;
3, 6 in.; ballast, 1 ft.; loam, 6 in.;
total, 25 ft. Water in above rose to 12 ft.
surface. In Bore-hole M., made ground,
blue clay, 7 ft.; peat, 4 ft.; blue clay,
fine sand, 6 ft.; gravel, 1 ft.; clay, 5 ft.;
1, 30 ft. In Bore-hole M., made ground,
chalk, 6 ft.; blue clay, 6 ft.; peat, 4 ft.;
ballast, 5 ft.; loam, 2 ft.; London
4 ft.; total, 30 ft.

Messrs. Holloway Brothers, of Battersea,
made a foundation where they encountered
sand upon a site in Parliament-street
near Swan Electric Light premises, near
St. John's Bank) by driving small piles—7 ft. or
longer and 6 in. circular, and pointed—as
together as possible over the whole
piling, and then sawing off the tops level, and
adding a concrete raft 7 ft. or 8 ft. thick over
the whole area. The new City Hall, Belfast,
designed by Messrs. E. Thomas & Son, archi-
tects, Queen Anne's-gate, stands on a piled
foundation, the site being a deep stratum of
alluvial deposit. Such foundations are
common in Belfast, and generally consist
of arch or other straight round timber, often
12 to 30 ft. in length. The custom is to
cut off the heads of the piles after driving to
proper and uniform level, and place upon
in timber sleepers (as shown in the diagram)
the support of a concrete table. An
example of a piled foundation to a pier under
a stanchion in water-bearing strata is shown
in a drawing on the wall. Mr. Florence
designed the following section for a building
Victoria-street, Westminster:—(1) 4 ft. of
ground; (2) 4 ft. blue peaty silt; (3)
sand and gravel; (4) 13 ft. coarse gravel.
The Army and Navy Auxiliary Stores the
station at about the same depth was also
to be sand and gravel. A clear stream
water runs through it, in which a chimney
it was built by the aid of pulsometers and
piles. The area of these premises has a founda-
tion of 5 ft. Portland cement concrete all over
1 lb. lead being used as a damp course.
The National British Gallery, Grosvenor-
road, designed by Mr. Sidney R. J. Smith, the
consists of surface earth, over peat, under
which are clayey bands and bands of sandy
clay, all of which were pierced by the founda-
tion until the ballast of the river bed was
reached at an average depth of 17 ft. to 20 ft.,
in some parts 25 ft. No particular diffi-
culty was experienced. The site is that of the
Millbank Prison, known as the Penitentiary,
the gas works in the Horseferry-road 30 ft.
gravel are recorded as having been passed
through, and this gravel is frequently water-
logged, so that where foundations of houses
rested on it with unprotected basements, the
ground becomes troublesome during high tides,
water rising in the cellars of houses built upon such
a lying ground. Alluvial deposits prevail
in part of the area, consisting of silt and clay,
varying in thickness from 7 ft. or 8 ft. to a thin
stratum. The gravel and sand on the site are of
considerable thickness. In the case of a clayey
soil overlying a watery gravel, where the
structural loads are not sufficient to warrant
piling the foundations through the gravel
into the clay, it is well to leave a thin crust of
the very material over the gravel so as to prevent
water working up through the foundation,
which would cause the gravel to work loose.
In dealing with a loamy soil it is quite pos-
sible to overload a foundation. Water will
run through a loamy soil that is not spongy,
and dry like cheese it does not then contain
argillaceous matter which gives it a spongy
character, and which would cause it to run,
under pressure, like mud. The following is an
example of the use of the brick seating on con-
crete for piers to a warehouse, built over a
dry compact loam foundation.

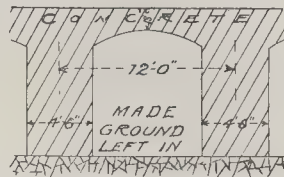
Concrete footings provide a distribution of
weight over the whole area when a sufficient
thickness of concrete for a footing is put in, because
any cavity or unevenness of the ground is
completely filled with plastic material. Concrete
is quite as good as brickwork or masonry
to bring the work up to the surface under
ordinary circumstances, but in the case of
vibration, brickwork is
ideally preferable. Brickwork also may be
of smaller dimensions than concrete, so
that the space occupied is less. Thus, at the
rough Market, Southwark, where the founda-
tions had to be carried down from 22 ft. to
12 ft. below the ground line, the piers carrying
the roof columns were built in brickwork
or concrete footings (see lithograph). When
the templates are introduced on top of
the piers, as is frequently found expedient, it

must be remembered that the great thing is
perfect bedding of them in cement. At the
Tower Bridge, layers of canvas and red lead
were placed between the base of the steel
columns and the granite beds upon which they
stand, in order to obtain a uniform bearing
over the whole surface. Felt carefully laid
under the bearing of iron girders is preferable
to sheet lead, unless the pressure is sufficient
to crush the lead so as to insure a uniform
distribution of pressure. Portland cement
should be used for concrete work under a bed
stone. Ordinary lime concrete is long in
setting. The centre of the mass of a large
concrete block may not become hard for years,
where a block made of one part Portland
cement to seven parts of other approved
ingredients, carefully and well mixed, will
safely bear a load of five tons per square foot.
According to Mr. Stoney, bricks not of an
extra hard description in cement will bear a
crushing weight of 521 lbs. per square inch, or
33½ tons per square foot. Allowing a factor of
safety of 6, we obtain 5.6 tons per square foot safe
load. Rivington's notes on building construc-
tion give brickwork in mortar ½ cwt. per square
inch safe resistance to compression, or 3.6 tons
per square foot. The resistance of brickwork
to cracking or crushing in a pier is much less
than that of the bricks alone. Ordinary stock
bricks will stand 8 cwt. per square inch, or
5½ tons per square foot. Much valuable
information hereon was given in the investiga-
tions made by three series of experiments on
brickwork tests, made for the Royal Institute
of British Architects and published in their
journal. In the case of the Imperial Institute,
bearing plates for the girders, where resting on
brickwork, were calculated for 16 tons per
square foot of area, but then special bricks of
Jennings manufacture, built in cement, were
employed.

In fixing stanchions over a cement base, it is
necessary to provide ample space for grout.
The stanchion is set vertical by means of long
and shallow wedges, occupying a depth suffi-
cient to allow 1½ in. under the base of the
stanchion, and a hole 2 in. diameter should be
left in its base, as near the centre as possible,
not to pour in the grout but to see it rise when
the under part of the stanchion is completely
grouted up. A temporary trough is formed
round the base to receive the liquid grout, and
the wedges should not be drawn until the grout
has well set.

In the case of a roof of three spans, subject
to the effects of lateral wind pressure, when
supported on side walls with intermediate
columns, where the situation did not permit
either the addition of buttresses or of anchorage
in these side walls, the horizontal reaction of
the wind pressure may be taken by anchoring
the intermediate columns to a concrete founda-
tion. At the Institution of Chartered Accountants,
Moorgate-street, Mr. John Belcher found the
ground so unreliable that he adopted the pre-
caution of putting a layer of Portland cement
concrete over the whole site 3 ft. deep. The
result has been satisfactory, no settlements

it was 7 ft. thick, and that under the walls
of the Great Hall was 10 ft. thick. Portland
cement concrete rafts, 2 ft. thick, have been
built under five-story buildings on compact
loamy soil over gravel, the concrete being
dipped where required to obtain the proper
fall for drainage pipes to run over the surface.
Another plan frequently advantageous to
adopt is to sink piers 12 ft. to 15 ft. (centres)
apart, and 4 ft. 6 in. square, in pot holes dug
out of made ground and then to form concrete
arches over the intervening unreliable ground,
with a minimum thickness of 18 in. (see sketch

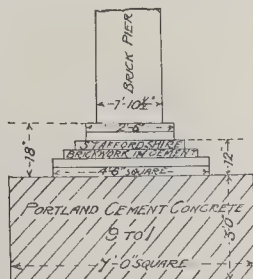


section). This plan was adopted by Messrs. F.
& H. F. Higgs for some premises at Stratford
and at Lea Bridge, also for a church at South
Bermondsey. In the latter case, 6 ft. of soft clay
or mud, then 5 ft. or 6 ft. of peat and 4 ft. of
running silt had all to be gone through before
the gravel was reached, and the concrete piers
were here connected by a concrete lintel 3 ft.
thick in which steel joists were embedded.

At the Institution of Civil Engineers, 25,
Great George-street, Westminster, the founda-
tions to the two party walls upon each side of
the Institution building were carried down
about 22 ft. below the pavement level, that on
the west side being 22 ft. deep, that on the east
side 24 ft. The front wall was 25 ft. below the
paving level. The concrete was laid under
walls only, and was about 10 ft. 6 in. by 5 ft. 2 in.
wide at the east party wall. Mr. Charles Barry
was the architect, and Messrs. John Mowlem
& Co. contractors.

The Institution of Mechanical Engineers at
Storey's-gate, Westminster, stands on what
appeared to be a wharf, and the roadway in
Princes-street was possibly an inlet of the
Thames. The contractors excavated the piling
and black earth, formerly, doubtless, faggots,
and gradually came to a fine Thames sand at a
depth of 23 ft. below the roadway, gradually
getting coarser until fine gravel was reached
at a depth of 28 ft. below the roadway, upon
which the concrete foundations were laid (see
lithograph). The main walls were then marked
out and excavated to a mean level of 28 ft., the
strata gradually developing into a fine gravel,
which Mr. Basil Slade, the architect, considered,
after sounding, to be a good foundation. On
this, concrete composed of blue lias lime and
Thames ballast was laid to a depth of 10 ft. 6 in.
and width of 7 ft. 6 in. Water seemed to
circulate through the gravel below a mean
depth of 23 ft. 6 in., and the influences of the
tides were felt. A pulsometer pump in a
well was set to work, and the trenches drained
sufficiently to allow of work being executed;
after the concrete was all laid, the water was
allowed to find its level. At a depth of mean
level 15 ft. 6 in., a tabletop or basement floor
was laid, and a layer of Portland cement
concrete 6 in. thick as foundation of finished
floor in granolithic or asphalt. The strata
throughout was very even, and the work pro-
gressed steadily without difficulty. There are
two floors below the ground floor, both of
which, the architect states, are as dry as a bone.
The damp course and retaining wall lower
course was of trowelled Seyssel asphalt. The
precaution was taken of putting drain-pipes in
the concrete below water level, to allow the
water to pass freely through the sand and
gravel within the main walls.

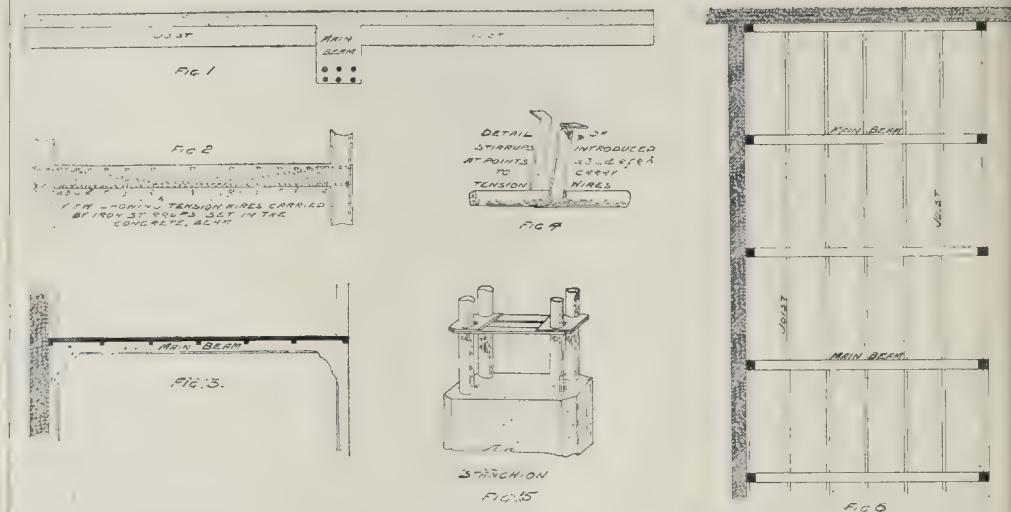
At the Surveyors' Institution, 12, Great George-
street, in the new building designed by Mr.
Alfred Waterhouse, architect, and built by
Messrs. Foster & Dicksee, contractors, the
section of strata shows 3 ft. or 4 ft. of made
ground on top, about 4 ft. black mud, 6 ft.
clay and brick earth, clay and sand mixed, and
3 ft. gritty sand, below which is the ballast or
London gravel. In some cases the foundations
were carried down 18 ft. deep, but only where
the principal weights of the structure occurred.
A concrete (six to one) raft, 2 ft. 6 in. thick, is
carried on continuous concrete walls round
part of the outside and under main walls and
piers of the building. Continuous concrete



Use of brick seating on concrete
over good dry compact loam
foundation

having occurred anywhere. At Kennel's
Wharf upon the Middlesex side of the River
near Southwark Bridge, the foundation con-
sisted of 8 ft. of concrete spread all over the
site and increased in thickness under the
main walls. The late Mr. G. E. Street, R.A.,
used selenitic lime in the concrete foundations
of the Law Courts. Under some of the walls

HENNEBIQUE CONCRETE SYSTEM



about 14 ft. deep under the raft, and width 5 ft. 6 in. to suit the footings of a 2 ft. 3 in. wall (footings 4 ft. 6 in. plus 6 in. concrete either side = 5 ft. 6 in.). All timber was removed in lengths of say 10 ft., 3 ft. framings as the concrete filling was carried up.

At The British Institute of Preventive Medicine, Chelsea Bridge-road, the foundations were carried through made ground and clay under, to a depth of 40 ft. below street level; under the clay was found peat, and under the peat 5 ft. to 6 ft. of fine dirty sand—then ballast. A concrete raft, 3 ft. 6 in. thick (six to one), intervenes between the top of piers and the bottom of the brick footings. The position of the piers under the raft was settled by the cardinal points of the building, thus forming a kind of propped-up dining table or platform with several legs.

Mr. Dulac, one of the contractors for the Paris Exhibition of 1900, has endeavoured to avoid the labour of excavation and necessity of carting away bad ground; also, to save the expense of timbering and trenching by compressing and ramming the soil in the following manner. With the aid of a steam pile-driver and the employment of rams of various shapes he forms a bore-hole, which he fills with hard substances after each stroke of the ram. Thus, in dealing with a light, friable soil, a conical ram is used, and in some cases a mushroom-headed ram is applied successfully. In this way, by forming holes about 3 ft. apart, and forcing the selected material sideways into the ground surrounding the cavity, the soil is consolidated to receive a superstructure. The drop allowed for the ram depends on the nature of the ground, the operations in the case of water-logged soils being aided by the insertion of ashes mixed with quick-setting cement, intended to produce a species of tube or sheath for the passage of the ram in the driving in of further hard substances.

At Victoria Station, Pimlico, the Engineer to the L. C. and D. Railway, Mr. Roche, states that in recent work they have found good gravel at a depth of 16 ft. from the surface, and have dug 8 ft. into the gravel without passing through it.

At Sion College, upon the Thames Embankment, Messrs. Foster & Dicksee state that in this foundation they went down to the London clay. The method there adopted was to have great pier holes about 8 ft. by 8 ft. on plan, going right down to the clay, filled up with cement concrete, and from these brick arches carrying the main walls.

In cases where partly-made ground and partly water-bearing gravel is encountered, a raft of concrete, about 6 ft. to 9 ft. thick, has been successfully used with a gridiron of steel contained therein.

An example of steel construction introduced

into a concrete foundation at points where main pressure occur may be cited, in the case of the building of a new front to a Congregational Chapel at Canning Town, designed by Mr. F. W. Troup, architect, where the foundations had to pass through layers of peat and clay to the ballast below, and where the new front had to be constructed so as to be independent of the interior existing building. Also some premises known as Mansfield House, by the same architect, in which concrete 3 ft. thick was laid as a foundation, with 8 in. by 3½ in. rolled steel joists, having bolts 12 in. long at each end, so as to give a tie in the centre of the concrete raft in which they were embedded. Very little excavation was needed. The subsoil consists of layers of peat, peaty clay, and clay to a depth of 15 ft. to 20 ft., when good ballast is reached. The foundation sunk 1½ in. at one corner at the back of the premises, and 2 in. and 3½ in. respectively at the two corners of the front of the premises, but no cracks appeared in the building generally, and the sinking appears to have gone on as the building rose. One corner of the building in front overhung about ½ in., but the other parts of the building appeared to remain quite vertical. At the back of the premises, the top of the concrete, which was laid 9 in. lower than in the front portion, was 18 in. above the natural level of the ground. It is natural that the lower down the river we go, any foundation work becomes more troublesome than is generally experienced in up-river sites.

The annexed diagram indicates the Hennebique system of concrete construction: in which, in addition to the use of iron bars or rods to resist tensile stress, a stirrup is inserted at intervals, with the object of holding up the tension members. These stirrups are placed nearer together at the ends of a beam than in the centre, and the system is designed, not only for floors but for spreading the weight of a superstructure over an extended foundation on soft ground. The calculated strength is the resistance of the iron added to the resistance of the concrete.

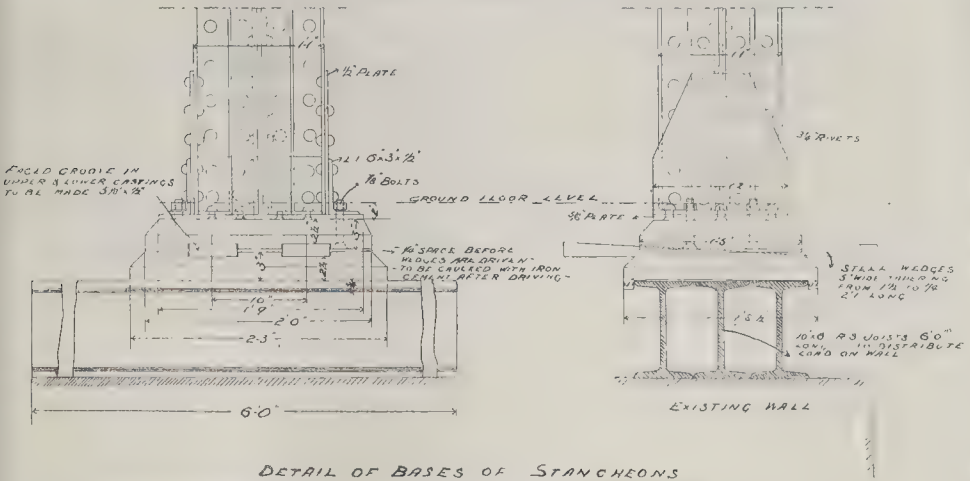
In the execution of a contract for demolishing an old building in Maiden-lane, Strand, and building a new one, three stories below ground and ten (subsequently reduced to seven), above where the site adjoined a court 3 ft. wide, upon the opposite side of which was a four-story warehouse. The contract arrangements did not permit of the removal of the soil of the court, and the underpinning of the wall to the warehouse; so the ground had to be kept up with the superincumbent weights all round. The contractors timbered with 2-in. polings, aided by 9-in. and 12-in. timbers, both for struts and waleings. This, however, proved quite inadequate at a depth of 30 ft. to 42 ft., the latter being the depth of the bottom of the

trenches. The weight caused the 12-in. logs to bend as much as 2 in. in the distance of 5 ft. at which the cross-struts were spaced. As a consequence, the houses all round, and particularly the warehouse across the court, began to indicate signs of settlement. The thickness of the retaining wall was increased, and inverted introduced, and struts placed. Difficulties as to the projection of the area into the street prevented the contractors carrying the excavation to the full extent shown upon the plan when the excavation was commenced, consequently, at a later period, when the building appeared above ground, the front planking and timbers had to be taken out, about one sixth more earth excavated along the frontage and the ground re-timbered. When this process had reached about 30 ft. out of the 42 ft., an accident occurred. This timbering gave way at midnight, and let into the basement of the building the whole of the earth above, due (as the contractor believes) to some soakage going on in the blue clay and causing it to spew out at the base. The gas and water mains in the narrow street became broken and the sewer injured. The site appeared to be smothered in liquid mud 30 ft. deep in the trench. Probably if sheet piling not less than 3 in. thick had been driven close together, joint to joint, anxiety might have been relieved by the use of additional struts. The employment of 2-in. poling boards—which the author understands to mean boards 2 in. thick inserted behind the waleings at slight distances apart—is only effective where the ground is self-supporting, or nearly so. In ground of a loose kind, close sheeting in all such excavations is absolutely necessary.

In the construction of the Central London Railway the clay has been reached at a depth of 29 ft. 6 in. below the surface at the Bank Station adjoining the Royal Exchange, at 29 ft. 6 in. at Chancery-lane, and 21 ft. 3 in. at Davies-street, Oxford-street; the excavation in the shafts indicating 12 ft. of made ground over 18 in. of loam and 16 ft. of gravel at the Bank Station, 6 ft. of made ground over 14 ft. 4 in. of gravel at Chancery-lane, and 12 ft. 6 in. of made ground over 8 ft. 10 in. of hard mud at Oxford-street.

While at some places the ballast has been found almost immediately below the surface there are other places where the solid stratum of gravel underlies marshy ground to a depth of 15 ft. or more. In underpinning an existing structure when building an adjoining structure, the foundations for which are required to be at a greater depth than the existing building, the work should be set out so as to be executed in sections of about 5 ft. to 10 ft. in length, one length being completed before the adjacent length is commenced, and each succeeding section in

THE LORD WARDEN HOTEL-DOVER

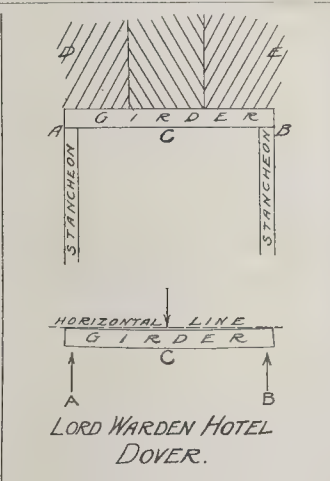


DETAIL OF BASES OF STANCHIONS

serted, so that one or more undisturbed section or space of 5 ft. to 10 ft. is allowed to exist between the section in course of progress and the last finished section. The wall which is underpinned will thus stand on piers 5 ft. to 10 ft. long, with undisturbed ground intervening. When the stratum of earth on which the piers are built does not prove strong enough to sustain the load upon the piers—an occurrence which cannot be ascertained until excavations are made—the intervening bays should be excavated and the foundations made continuous; but in this case the process of needling up is indispensable, a diagram for which is annexed (see diagram on lithograph sheet). Care must be taken in fixing the needles to leave room to excavate and to fill in between needles before drawing them; also to employ a proper use of raking and shoring pieces and filling in of window openings as may be essential to obviate danger to the structure, and take care to build up the section with the quality of brickwork suitable for foundations.

In underpinning work brickwork is usually preferred to concrete, because it is easier to ensure tight packing under the old work. Concrete has, however, been successfully used to underpin buildings when carried up to within about 1 ft. or 18 in. of the old work and then allowed to set, for at least a couple of days before ramming in the remainder with iron rammers, the concrete so used being in a semi-dry condition, and care being taken not only to board up the face and wedge the boards tight against the face of the plastic concrete, but to hammer the boards well in, so as to ensure uniform support to the concrete until it has set.

Having underpinned in narrow sections of brickwork upon a concrete foundation, the next step is to grout up and properly make good to existing work, and allow this to set for (say) seven days before the next section is disturbed. Where concrete without brickwork is adopted for underpinning the time needed for setting is longer, and as underpinning is usually employed in piers, the employment of brickwork is a more speedy operation. In the case of some residential chambers being built upon the site of Cleveland House, St. James's-square, consisting of eight floors, including basement, to the design of Messrs. Rolfe & Matthews, it became necessary to underpin the old wall of the adjacent building, 20, St. James's-square, under the care of Mr. T. Garratt as architect. The old building, the wall of which had to be underpinned, consists of five floors, including basement, and the strata is dry sand. The whole of the underpinning consisted of picked Fletton bricks in cement, resting upon a good bed, attained at the depth excavated in the sand. No concrete was used under the old wall of this adjacent building. The underpinning was carried down in piers under the existing footings to 12 ft. to 13 ft. below the basement floors, in places



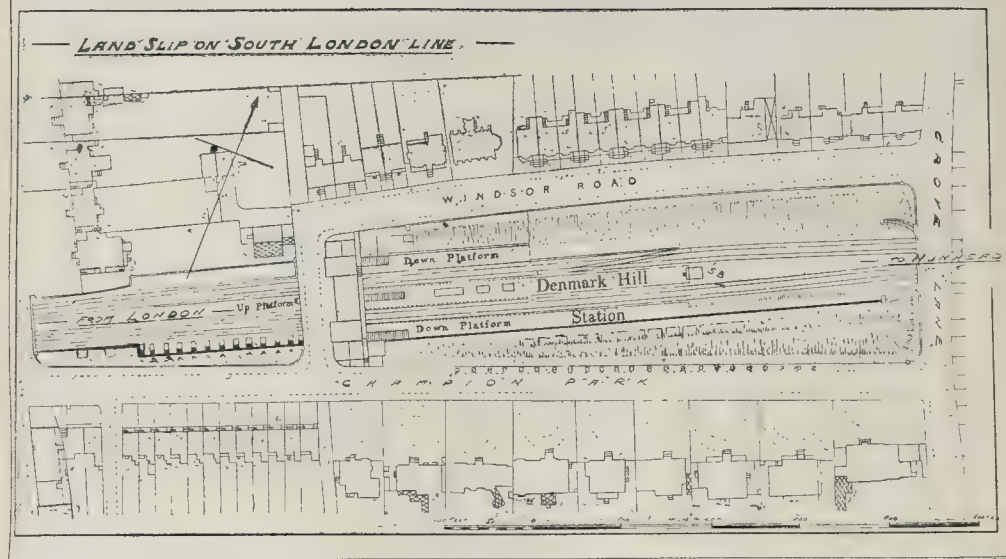
where steel stanchion foundations were introduced in the new building to carry the floor girders. The remainder of the wall was underpinned to an average depth of 5 ft. 6 in. below the basement floor, which is about 11 ft. below the road level, or a total depth of about 16 ft. 6 in. The foundations to the walls of the new building are concrete, and to ensure a straight joint between the old and new building, thin sheets of iron were placed between the brickwork of the old building and the concrete of the new building in the foundation and dry sand filling between the old and new work above this level, so that the new work can settle quite independently. The old wall of 20, St. James's-square, varies from 18 in. to 27 in. in thickness, the adjoining new wall of the residential chambers being 22½ in. at the basement floor. The excavations were made so as to build piers in 4 ft. to 6 ft. lengths, leaving a similar length between each pier undisturbed until these piers were set, a minimum of four days for this purpose being required. The intervening space was then cleared and the underpinning completed to form a longitudinal continuous support. Where cross walls appeared, the underpinning was carried about 2 ft. 6 in. under the cross wall beyond the longitudinal underpinning.

In the improvements recently effected at the Lord Warden Hotel, Dover, several interior walls upon the ground floor were removed to form an area facing the main entrance suitable

for a lounge. It being decided to carry the stanchions, which had to be inserted to support girders carrying the upper walls upon the lower existing walls, Messrs. Handyside & Co., the contractors, introduced 10 in. by 6 in. rolled steel joists 6 ft. long, as distributing girders, over which a cast-iron bed-plate rests, and between this bed-plate and the foot-plate to the stanchion very flat steel wedges were introduced, tapering from 1½ in. to ¼ in. in a length of 25 in. (see diagram), the object being as follows:—

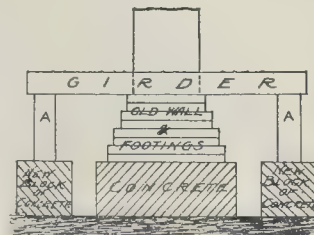
The wall D to E being properly needled up, the lower portion is removed, the girder C inserted, bearing on the stanchions A and B. Brickwork is then built over C, and the wedges to stanchions A and B so adjusted that by assuming the curve shown below, the girder is given work to do before the remaining brickwork is inserted. By this means further deflection is obviated, and subsequent cracks in the existing upper wall are avoided.

In the building of the new Carlton Hotel, Haymarket, the old walls of the Opera House foundations were left intact, except where the contractors found it necessary to cut through them, for purpose of the new work. The formation was tested to 36 ft. 6 in. depth below street level, and found to be loamy sand, suitable for foundation. The new front walls are all solid foundations upon continuous concrete. Portland cement concrete (six to one) 3 ft. thick, was placed under the main walls and under the intermediate walls, everywhere of the same thickness except under the 9 in. walls, where 2 ft. thickness was adopted, and under stanchions, where a base 9 ft. square is used, 4 ft. in depth. There is not more than 2 ft. difference of level in the top of all the concrete, a difference necessary to suit the floors. The width and depth of concrete employed for this building is as follows:—For 9 in. walls, 2 ft. 6 in. wide, 2 ft. thick; 14 in. walls, 3 ft. 4 in. wide, 3 ft. thick; 18 in. walls, 4 ft. wide, 3 ft. thick; 1 ft. 10½ in. walls, 4 ft. wide, 3 ft. thick; 2 ft. 3 in. walls, 5 ft. 6 in. wide, 3 ft. thick; 2 ft. 7½ in. walls, 6 ft. 6 in. wide, 3 ft. thick. The solid columns, 8½ in. diameter (hammered steel ram), are carried on a cast-iron base plate 2 ft. 8 in. by 18 in., seating on five rolled steel joists, 18 in. by 7 in., embedded in the concrete, each 7 ft. long. In some cases four rolled steel joists are used, carrying a solid rolled steel column 7 in. diameter. The stanchions are embedded in the brickwork where walls permit, and carry the wall girders. All brickwork is in cement throughout. For large weights, solid blue brick piers in basement support stanchions. The wall next the Arcade had to be underpinned by piers 18 ft. deep. This wall formerly took the roof of the Arcade and side of old theatre, but now supports the side wall of the hotel, and seven floors. Six distributing rolled joists, 10 in. by 4½ in., are inserted to carry the weight of the upper wall on top of crown resting on



brickwork. A stanchion was built into each pier, leaving about 2 ft. of the facework next the Arcade intact. New arches were inserted, using the old arches as centres. The old arches were then cut out and the new piers carry the Arcade roof and hotel wall at this side. The stanchions, with the surrounding brickwork, carry the springing of the arches. Two 12 in. by 3 in. channel sections, with two 16 in. by 1 in. plates, form the stanchion, 13 in. by 16 in. over all. Four rolled joists carry a 16 in. square stanchion, 20 ft. 2½ in. long, with steel rivetted to the stanchion at the base, and an 11 in. column above this, 22 ft. 5½ in. long, making altogether 42 ft. 8 in. height. The stanchions and columns are employed for interior walls only. The 7 in. columns, 24 ft. 3 in. over all, vertically have a base plate 2 ft. by 18 in., and the construction erected by Messrs. R. Moreland & Son is an interesting example of the use of solid steel stanchions and of distributing girders in foundations arranged with the aid of a cast-iron base plate to give a pressure not exceeding 1½ tons per square foot. Mr. H. L. Florence is the architect.

At Great Yarmouth, within two years of the building for the Town Hall being completed, it was found that the western portion, near the river, was settling considerably, and levels were taken monthly with the result that Mr. Cockrill, the Borough Surveyor, found these settlements were continuing, especially after heavy rains, or very high or very low tides. The late Sir J. Bazalgette was called in, and he recommended underpinning and building walls under present foundations with concrete blocks. Borings were made showing 6 ft. of made ground and 18 ft. to 20 ft. of soft ooze, below which was gravel. Mr. Cockrill carried on the works under Sir Joseph Bazalgette's instructions. The method of procedure was to sink two cylinders entirely without pumping, a grab being employed to remove the soil inside cylinders, and divers to level and sink them. These were sunk to a depth of 40 ft. A trench was opened from the cylinder out to the north-west corner of the building, but immediately on commencing to pump, a settlement was caused in the building which so frightened the municipal authorities that they stopped the works, and, of course, as the water rose in the soil, this finished all chance of doing anything further with it. Mr. Cockrill, however, is very strongly of opinion that if they had allowed the matter to have gone on he could have underpinned the corner in forty-eight hours, and when one corner was done it would have been a comparatively easy job to have continued. Sir Benjamin Baker next came on the scene, and with Sir Joseph Bazalgette recommended widening the present foundations by using the concrete blocks made for underpinning (as sketch). The committee, however, resolved to pull the west part of the



YARMOUTH TOWN HALL

NOTE - Pressure to be put on at A with hydraulic jacks, & thus jacked up.

building down, but subsequently, upon the advice of Mr. F. E. Duckham, screw piles were introduced. Mr. Duckham's plans consisted of putting rows of cast-iron screw piles at intervals of 9 ft. inside and outside the main walls, each about 23 ft. long, screwed approximately 3 ft. into the gravel bank. On the heads of these piles, longitudinally and parallel with the wall, were placed girders about 15 in. deep, and across them, suspended by strong screw bolts, steel joists were placed under the concrete foundations, and then screwed up tight to the concrete, the whole being surrounded with concrete. No settlement has since occurred. The subsoil consisted of a gravel bank underlying 16 ft. to 18 ft. of ooze and 5 ft. or 6 ft. of made ground into which the trenches for the concrete foundations were cut. The removal of the water from these trenches tended to jeopardise the building. The piles employed were 2 ft. 6 in. and 3 ft. diameter filled with concrete so that in the event of the cast iron becoming injuriously affected by the soil of the district the internal concrete columns would sustain the superimposed mass.

In the construction of the Liverpool Overhead Railway, wrought-iron girders placed 22 ft. centre to centre, at a normal span of 50 ft. and at a height of 16 ft. above the roadway, are supported by columns built of two steel channels and two plates grouted at their base into cast-iron shoes which are anchored to concrete foundations by bolts, the concrete footings being arranged so as to distribute a pressure of one ton to the square foot over the surface of the made ground on which they stand.

The safe bearing power of various kinds of ground may approximately be stated as follows. Made ground, when dry, as firm earth will sustain, from 2,500 lbs. to 3,500 lbs. per square foot, or, say, from 1 ton to 1½ ton per

square foot; but if the subsoil be of an alluvial character, or quicksand, it will be prudent to allow only ½ ton to ¾ ton per square foot, and the same for soft clay near the surface; whereas with moist clay we can allow from 1 ton to 1½ ton per square foot; compact clay, nearly dry, from 2 tons to 2½ tons per square foot; dry, compact clay, of considerable thickness, from 3 tons to 5 tons per square foot; loose sand, from 1 ton to 1½ ton per square foot; compact sand, from 2 tons to 3 tons per square foot; compact sand, prevented from spreading, from 5 tons to 7½ tons per square foot; ordinary gravel and sand, from 2 tons to 3 tons per square foot; but if the same be compact, dry, and prevented from spreading, from 4 tons to 6 tons; while ordinary rock would safely carry 9 tons per square foot. In the case of the Tower Bridge, it was thought expedient to limit the pressure on the London clay, upon which the piers rest to 4 tons per square foot. When the bridge is loaded to its utmost capacity, it is calculated that the granite bed under the columns of the towers sustains 16 tons per square foot, and the Staffordshire blue brickwork immediately beneath the granite to tons per square foot.

At the Imperial Institute, designed by Mr. T. E. Colclitt, the pressure produced by the foundations upon the blue clay is estimated to be 2½ tons per square foot. The main walls are continuous, but the wing walls are carried by girders attached, in some cases, to stanchions built into brick piers, as shown in the diagram, so as to obtain easy communication in the basement area for pipes and storage connected with exhibition purposes. The stanchions, where introduced, are 14 ft. 5½ in. over all, and stand on concrete foundations. The outside walls are carried down 14 ft. to 19 ft. below street level.

Clay, when dry, and retained or excavated to a flat angle, is a safe foundation; but mixtures of sand and clay are bad, the sand admitting water and the clay retaining it. In such a soil, 2 tons per square foot of foundation is sufficient to assume. Landslips in clay occur when a clay bank is left insufficiently protected or at too steep a surface.

In many parts of the Midlands, where it is the immediate subsoil, structures built thereon are apt to slip, and end walls of houses to crack owing to the shrinkage of clay due to excessive dryness. A landslip occurred on the South London line, of the London, Brighton, and South Coast Railway, upon the south side of the line at Denmark Hill Station, where the railway passes in a cutting, having an average depth of 25 ft. along the side of the hill rising to the southward, and consisting of London clay. The slopes of the cutting were laid as flat as the limits of the land acquired would allow, and, in order not to encroach on the public road called Champion Park, a surcharged retaining wall was employed to uphold the

opes. For a period of about twelve years after the railway had been opened for traffic the retaining wall appeared quite sufficient to withstand the pressure of the earth behind, although some slight slips occurred on the surface of the slope; these being dealt with in the ordinary way—by taking out the slips and filling up the space with chalk. Later on, owing to a movement in the wall itself, more rigorous measures were adopted, and heavy concrete buttresses were put in below the foundations of the wall, and brought up to the level of the platform. This remedy answered for a time, but the mischief was still going on, and during the winter of 1881 made itself apparent by a further movement of the wall, a sinking of the roadway in Champion Park, with a corresponding rising of the permanent way, which was lifted 2 ft. It was, therefore, decided to put in another wall at the back of the old one, sufficiently deep and heavy to resist the increasing pressure of the moving clay. This was done by the construction of a wall 12 ft. in thickness in Portland cement concrete, the foundations being carried down to a depth of 18 ft. below rail level into the solid ground, undisturbed by the slip. In addition to this wall, which was built for a length of 400 ft., transverse counterforts, 5 ft. in thickness, were put in about 13 ft. apart, extending from the back of the wall up the slope to the road above, a distance varying from 20 ft. to 50 ft. The cause of the slip was probably owing to the accumulation of water in the ground forming the slope behind the wall. The presence of the water arose from two causes. 1. The flatness of the public road, and the non-provision of any surface drains to carry off the water for almost the whole length of the station, except at its extreme western end. 2. The existence of a sewer passing along Champion Park near the top of the railway slope, which probably was in a leaky condition. The water consequently found its way through some crevices or sandy veins in the clay, thereby increasing the pressure against the wall to such an extent as to cause a forward movement of the clay, which the wall was unable to withstand. The retaining wall at the west end of the station also showed signs of moving, and this was strengthened by building raking buttresses in cement brickwork, with intervening arches against the face of it with concrete foundations carried down to a depth of 10 ft. below the footings of the old wall. Three concrete counterforts, each 12 ft. by 10 ft., and 28 ft. high, carried down 10 ft. below rail were also introduced at the extreme west end of this retaining wall. About 10,000 cubic yds. of concrete were put in. The works enumerated above were commenced in December, 1881, and completed by August, 1883. The works as carried out have proved effectual in arresting the movement of the earth, and no further trouble has been experienced at this place. The diagram shows the locality, with position and extent of the remedial works.

The following table shows the angle at which different materials may safely be allowed to have sloping banks:—

Table of Angle with Horizon.

Earth.	Rankine.	Wray, Unwin.	Molesworth.	Natural Slopes.
Dry Sand and Mixed Earth	37° to 21°	—	—	1 1/3 to 1
Sand, Fine and Dry	—	37° to 31°	—	2 6/3 to 1
" " " Wet	—	26°	—	—
" " " Very Wet	—	32°	—	—
Dry Sand	—	—	38°	—
Sand	—	—	22°	—
Shingle and Gravel	48° to 35°	—	—	From
Loose Shingle	—	36°	—	0.9 to 1
Shingle	—	—	36°	1.43 to 1
Gravel	—	—	40°	—
Clean Gravel	—	—	48°	—
Gravel with Sand...	—	—	26°	—
Damp Clay and Drained	45°	45°	45°	1 to 1
Wet Clay	17° to 14°	16°	10°	3 2/3 to 1, and
Dry Clay	—	26°	—	4 to 1
Peat...	45° to 14°	45° to 14°	—	1 to 1 and 4 to 1
Vegetable Earth, Dry	—	20°	28°	—
" " Moist	—	45° to 49°	—	—
" " Very Wet	—	1°	—	—
" " Punned	—	66° to 74°	—	—
Compact Earth	—	—	56°	—
Rubble	—	—	45°	—

The Farringdon-street bridge of the Holborn Viaduct (see lithograph sheet) is remarkable as having a platform constructed of cast-iron arches and floor plates, the only wrought-iron employed being for the connecting bolts. The old bed of the Fleet River crossed the site where the viaduct is carried across the valley, and the bed of the existing Fleet sewer was about 22 ft. or 23 ft. below the old level of Farringdon-street at the point where the principal arch of the viaduct spans that street, upon the skew. This bed is clay. The scare created as to the fracture of columns or masonry in the piers was due entirely to bad face joints in the bedding of the granite work. There was evidence of stability in the foundations, as not the slightest movement had taken place. The excavations for the foundations were carried 7 ft. and over, below the old bed of the river into the solid blue clay and concrete, as shown upon the annexed sketch employed.

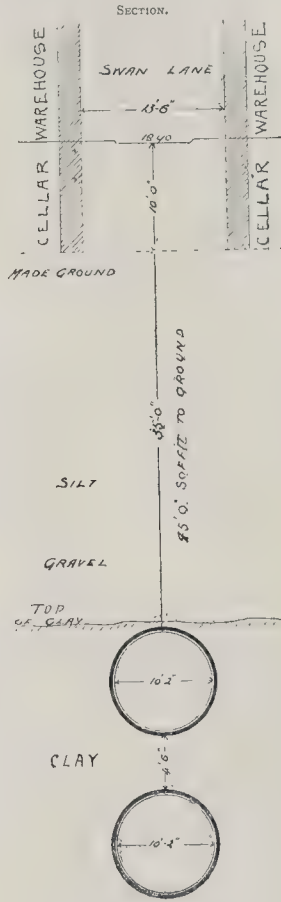
The foundations of the Great Northern Railway Company's goods station in the Farringdon-road are carried down to a depth of 16 ft. below the rail level. The piers are of Staffordshire blue bricks set in cement, and are built upon footings of concrete that rest upon the London clay.

The Great Northern Railway Company constructed an additional tunnel under some large warehouses in the Brewery-road, Islington, without the removal of any of the heavy stock contained in the warehouses or compensation for stoppage and loss of trade to the owners. The tunnel was built in 6-ft. lengths, and as each length was tunnelled out it was arched in at once and neat cement worked in by hydraulic pressure between the arch and the ground above, each length being completely finished before a fresh one was started.

Messrs. Holland & Hannen, of Bloomsbury, London, constructed at the Surrey Commercial Dock some new warehouses in the South Dock on concrete piers varying in depth from 22 ft. to 29 ft. The borings showed the strata in various positions on the site to be in most cases made ground, blue clay, peat, silty clay, sand, and gravel. There were altogether some 250 pier holes to be excavated 4 ft. 6 in. square, and averaging about 20 ft. below the surface of water in the dock immediately adjoining. It is obvious that to have kept each pier-hole separately pumped out during operations would have proved an endless task. A large sump hole was therefore formed in the centre of the site, and by these means the water strata was tapped, and by constant pumping the pier holes were kept sufficiently dry to work in. Some considerable difficulty was experienced with the pumping machinery at the commencement, as ordinary pumps were useless in consequence of the large amount of sand extracted with the water. Centrifugal pumps were tried, but without success, and eventually a Murray's endless chain pump was erected which worked satisfactorily until the pier holes were completed.

The City and Southwark Subway, now used as an Electric Railway, in its course between the Middlesex side of the river and the Monu-

ment Terminus, passed up Swan-lane near some heavy warehouses tenanted by Messrs. Harker & Co., 102 and 103, Upper Thames-street, spice merchants; Messrs. Walker & Co., Old Swan-lane, packers; Messrs. Davies & Royle, 3, Old Swan-lane, wholesale stationers; Messrs. Wigan & Co., 2, Swan-lane, importers of isinglass. Near the latter warehouse, immediately adjoining the route of the subway, the tunnel left the clay and entered the water-bearing strata shown on the annexed section. These



warehouses have basement, ground floor, first floor, second floor, and top floor space, all busily occupied, some rooms being used for heavy papers, others for cases containing various kinds of fruit and general heavy goods. When the subway works were commenced, various old cracks were found to have existed in these buildings, which gave rise to the apprehension that some danger might occur in the construction of the new tunnels, or by the subsequent working of the railway, so that certain marks were noted, and pieces of paper were pasted over various old cracks, and in other cracks cement-filling was put in, levels of doors and sills taken, and the buildings plumbed both in and out near the angles. This was in the year 1887, before the construction of the tunnel commenced. At Messrs. Wigan's they had an engine (ten-horse-power) constantly at work upon the ground floor, which would have run irregularly in the event of settlement.

Swan-lane, as indicated in the diagram, is about 13 ft. 6 in. wide, and the tunnels are there placed one over the other. Compressed air behind a bulkhead was employed to restrain the advent or inflow of water into the space excavated, and no settlement of the upper

surface resulted, the water-bearing strata being never without support.

The value of the Greathead system of working enables a running strata to be broken into without danger. Where buildings and wharfs are situated on the side of a river unsecured, and where the materials of its bed are not sufficiently firm to allow a shelf being maintained between the buildings and the low water line, the shore may run down and carry the foundation of the buildings along with it. An instance of sand thus running occurred in 1837, during the progress of the Thames Tunnel, notwithstanding the close protection afforded in the shield used by the late Sir Isambard Brunel, the sand running in to such an extent that, at a distance of 50 ft. east of the shield, the bed of the river sunk 13 ft., bringing the river within less than 3 ft. of the level of the excavation, while immediately above very little depression took place. A similar instance of running gravel is recorded when the shield approached the wharf on the Middlesex side, producing a conical depression 30 ft. in diameter and 13 ft. deep on the shore, followed by a subsidence of the wharf front. In the construction of the Blackwall Tunnel the use of the Greathead shield enabled the work to be successfully accomplished. In the construction of the Metropolitan District Railway between Westminster Abbey and Westminster Hospital the soil was sand and gravel, heavily charged with water, Westminster Abbey itself being on the sand. The nearest point of the works to the main walls of the Hospital was 23 ft., and to Westminster Abbey 70 ft. 8 in. The tunnel was made without the slightest settlement of adjacent buildings, notwithstanding the fact that in wet sand and gravel pumping was carefully resorted to, in order practically to dry the ground sufficiently for work. By the aid of iron tubing and the use of compressed air with the Greathead shield, as adopted in the City and South London Railway work, we need experience no anxiety. You can work as safely in gravel charged with water as you can in London clay. The ordinary timbering of a tunnel is a yielding material, so that, unless special precautions are observed, there is a risk for the framework to yield which is employed to temporarily hold up the excavation before the brickwork is put in; but with an iron lining and cement grouting outside, there is no need of alarm. The danger connected with pumping is obviated when it is carefully done. If it is carelessly done you may draw some of the finer particles of sand and water, and so undermine the foundations of an adjacent building to a greater or less extent. Where any accidents occurred on the construction of the City and Southwark Railway it was near the brick stations, where wood centres were introduced, but by adopting cast-iron lined shafts to the stations with cement grouting outside, any danger to surrounding property is avoided. On the Metropolitan Railway ordinary stock bricks in blue lias lime were used. In the Metropolitan Railway settlements occurred, as it was constructed mainly without an invert. The ultimate improvement was to put an invert, which, of course, gave greater support from the pressure of the sides. The system of construction was in some cases tunnel, near Kensington, for instance, but generally cut and cover. With the use of the Greathead shield upon the Central London Railway, where not in the clay, compressed air is introduced, and the work is entirely in tunnel. The iron plates are properly jointed throughout.

In the King's-road bridge over the Regent's Canal, Camden Town—designed by Messrs. Thomas & Taylor—the foundations were sunk 22 ft. below the roadway level, or 11 ft. 6 in. below the water level in the canal and 5 ft. 6 in. below the bed of the canal. The soil from the top of roadway to a depth of 18 ft. was found to be of a clayey character, below which was found a seam of clay-stones 1 ft. deep, and then clay suitable for a foundation. A trench 50 ft. long was made, in which a concrete bed 8 ft. 6 in. square in section was built, with counter-foots added at every 12 ft. It was found that this ground could be timbered by experienced men without driving piles, and without pumping beyond the removal of a small amount of soakage while the men are not at work.

Old Westminster Bridge, which was built between the years 1738 and 1750, consisted of thirteen principal and two smaller arches nearest the abutments, 25 ft. span, all semi-circular, springing from the piers at about 2 ft. above the level of low water. The central arch was 76 ft. span, but the principal lateral arches

decreased in width by intervals of 4 ft. each, and their intervening piers were supported by caissons consisting of rafts of timbers floated into position and then sunk in place, a level area having been previously dredged to receive them. Each raft was about 80 ft. by 30 ft. by 10 ft. deep, made watertight all round, within which a portion of the pier was built, and the raft was then floated to the site of the proposed pier, the water admitted by sluices in the sides, and the foundation guided to its proper bed by ropes from a light barge previously moored off the shore. None of the foundations, which all rested on a substratum of sand and gravel, were at a greater depth than 14 ft. below the bed of the river, and parts were not more than 5 ft. or 6 ft. The wooden platforms carrying the base of each pier thus ran the risk of settling upon an irregular foundation, and gradually getting undermined as the bed of the river lowered. Originally the piers were intended for a light wooden structure, but when it was determined that the bridge should be built of Portland stone, a stone casing was built around them. The bed of the river on which the caissons rested became undermined, particularly when, in later years, the tidal current, since the removal of the numerous piers of old London Bridge, ran off with greater rapidity than when old Westminster Bridge was erected, and produced a general, though not uniform, lowering of the level of the river bed.

A similar plan was, however, followed in the case of old Blackfriars Bridge, built 1760 to 1770, the platforms here employed being 88 ft. by 37 ft., and two balks and a half thick, but in this structure bearing piles were introduced to obviate the liability to settlement. This bridge consisted of nine arches, elliptical in shape, constructed in Portland stone. The centre arch was 100 ft. span, and the side spans decreased gradually to 98 ft., 93 ft., 83 ft., and 70 ft.

Waterloo Bridge, built in 1811 to 1817, contains nine equal semi-elliptical arches of 120 ft. span, and was the first bridge on the river in which coffer-dams were employed. These consisted of double piling, with puddle between, and did their work successfully during construction. Like old Westminster and Blackfriars Bridges, however, the foundations of Waterloo Bridge were left upon sand and gravel, and not carried down to the clay.* Each pier was, however, built upon piles, there being one pile to every square yard of bearing surface. The heads of these piles were sawn off, and timber sills or bearing piles and waling pieces fastened on both transversely and longitudinally, upon which a flooring of 6-in. planks was fixed, and then the first course of masonry laid thereon.

The system of laying the foundations dry in coffer-dams was followed in Southwark Bridge, and the same plan adopted at new London Bridge, the former built 1814-1819, and the latter 1823-1831.

In old London Bridge the piers were built on platforms supported on elm piles, driven into the bed of the river and cut off at low water level. In new London Bridge the foundation consists of timber piles 12 in. to 14 in. square, shod with wrought-iron shoes, weighing 35 lb. each, and hoops 30 lb. each, driven at intervals of 3 ft. 6 in. to 4 ft. centre to centre, so that 16 square feet of masonry are taken by each pile. The bearing piles are here driven into the London clay about 18 ft. below the platforms.

Sections of the piers and arches of London and Waterloo Bridges are given on a lithograph plate in this issue.

The importance of establishing a foundation to resist undermining action cannot be overrated. Uniform width in a river produces uniform scour, which, while it creates a better channel for the discharge of flood water, also attacks any impediments it encounters. Since the construction of the Thames Embankment, the bed of the river parallel to the Embankment has varied considerably.

In new Westminster Bridge, completed in 1862, the foundation of each pier is entirely piled over with 145 elm piles, driven centre to centre, 3 ft. 3 in., and 2 ft. 6 in., passing through the gravel into the London clay, and cut off below low water. To avoid the expense of permanent coffer-dams, these piles were surrounded with iron piles connected by cast-iron plates driven between them, known as "plate piles," so as to form a complete casing, the interstices between all the piles being filled in with concrete. They go about 10 ft. into the

blue clay, and extend about a foot above the gravel bed. Upon these is placed a series of slabs of granite edgeways, the plate piles being secured by two sets of ranges of iron ties, passing through the pier, and fixed by divers, the granite slabs secured both by the masonry of the pier and by the main piles to which the plate piles are connected. A complete caisson is thus formed, which has caused the necessity of the interior piles to be much questioned.

In new Blackfriars Bridge, built 1864-69, wrought-iron caissons were employed for the foundation. Each pier stands upon four independent rectangular caissons, 36 ft. by 18 ft., carrying the centre of the pier, and two triangular caissons projecting beyond, to carry the cutwaters. These caissons were built upon a stage, and lowered, by the aid of guide piles, into their assigned position, with their cutting edge resting on the bed of the river. The ground enclosed in each caisson was then excavated by divers, and the caissons sunk by being weighted with iron kentledge until the clay was reached when leakage ceased, and the caisson by protracted loading took its final bearings at an approved depth of excavation. A material like the London clay is for all practical purposes incompressible, especially when prevented from spreading laterally, and deep down; so as to be unaffected by heat or damp. The caissons were then filled with concrete in cement, upon which was placed 8 ft. of brickwork in cement, the top of which was at a level of 4 ft. below low-water mark. A space of one yard was left between the caisson sections, which was subsequently filled with concrete in cement up to the same level, so as to provide an uninterrupted area over the base upon which each pier now stands, and the movable portion of the caissons above 4 ft. below low-water level were removed as the work proceeded.

Cylinder foundations were first used by the late Sir W. Cubitt, at Rochester, and their employment has since been efficiently tested to show their adaptability for foundations. They were adopted for the original railway bridge at Blackfriars, 18 ft. diameter, below the stone piers. Cylinder foundations, 18 ft. diameter below, and 12 ft. diameter above the bottom of the river are used for the piers of the Cannon-street railway bridge. At Charing Cross the cylinders are 14 ft. diameter below and 10 ft. diameter above the ground. The foundation cylinders of the Albert-bridge at Chelsea are 21 ft. diameter, and their mode of fixture is described by the author in the discussion which took place on Mr. Crutwell's paper at the Institution of Civil Engineers, in which the foundations of the new railway bridge across the Thames at Blackfriars were described, and for which rectangular caissons, sunk 16½ ft. to 23½ ft. below the river bed, were adopted (see Min., Inst. C.E., vol. ci.).

The Victoria railway bridge over the river at Battersea was originally constructed with piers on the up-river side standing on a bed of cement concrete enclosed by permanent sheet piles driven to a depth of 8 ft. below the lowest foundation level, but when widened, the increased width of foundation was obtained by sinking permanent cast-iron cylinders to a depth of 45 ft. below Trinity high water on the down-river side, four to each pier, 21 ft. internal diameter, and 24 ft. long, cast in segments 8 ft. in length, with flanges for bolting together. These cylinders were filled with cement concrete for a depth of 12 ft., upon which was laid brickwork in cement up to low-water level, above which level temporary wrought-iron cylinders were employed. The foundation cylinders were united at the top by a framework of cast-iron, but the masonry between the cylinders is principally carried by brick arches in cement turned between the cylinders in the hearing of the piers, which from this level to the springing line consist of solid brickwork in cement faced with masonry, so as to present the appearance above low water of a continuous pier.

Diagrams are shown of the foundations for the destructor cells and chimney shaft designed by Mr. J. W. Cockrill, a member of this Association, for the Borough of Great Yarmouth. Concrete blocks were employed, built in brickwork cylinders as shown, and the maximum pressure per square foot on the subsoil was calculated to be 4 ton 6½ cwt. As shown on the section the ground is of a very marshy character overlying sand and coarse gravel, into which the foundation is sunk. The cylinders are constructed of 9-in. brick-work, built in Portland cement, the lower 4 ft. being encased in a wooden drum, with cutting edge sunk

* See the Builder for March 10, 1883.

the gravel and sand at least 2 ft. The piers are sunk by the aid of a grab, the bottom being levelled, and the concrete is laid by a diver. In this way the risk of the cylinders already in their places being disturbed by the grouting is avoided. The blocks are grouted with a 3-in. pipe with liquid cement, the grout being forced into the joints and lewis holes having been previously removed. After about four days with coarse, clean shingle, and thus forming a watertight bottom, the cylinders are placed out and filled with concrete composed of 1 part shingle, one part sand, and one part Portland cement. The remainder of the foundations are low, and light in weight, the concrete foundations tied with iron joists spread to such a width that the sub-soil need not receive a greater weight than half a ton per superficial, which, it has been ascertained by experiment, can be carried on soil after the upper layer of turf and roots have been removed.

A Dredger's "Suspension Bridges" published in 1832, we find the following allusion to foundations:—"A good plan for foundations, on the ground is loose and sandy, is to build in wells, in the way practised in Madras for public buildings. These wells are made circular, about 3 ft. diameter, and one brick wall. The first course is laid and cemented on the surface of the ground; when dry, the earth is excavated inside and round out it to allow it to sink. Then another is laid over it and again sunk. The well is thus deepened, sinking the brickwork bodily to the depth of 10 ft. or more, according to the nature of the soil. The interior is then filled up with rubble work. All the public buildings at Madras were erected upon foundations of this kind, which are found to answer very well."

The Dover Electricity Supply Company erected works adjacent to the River Dour, in which the town is named. These works were a chimney, designed by Mr. F. G. G. H. of Westminster, about 130 ft. high, on a concrete base 24 ft. 3 in. square by 5 ft. 6 in. The drawing upon the wall shows the structure.

The River Tyne at Newcastle affords instructive examples of riverside foundations. The quay walls, with a depth alongside at low water, varying in the year 1840 from 2½ ft. to 4 ft., had a piled foundation, and when in 1860 deeper quays were deemed essential, 12 ft. of water at low tide was considered ample, which was subsequently increased to 22 ft. The foundations were adhered to, until upon the advice of the late Mr. T. E. Harrison, Engineer to the North-Eastern Railway Company, cast iron cylinders sunk under atmospheric pressure for the substructure of the quay were adopted for new work, as cheaper than piled work. Two rows of cylinders were employed, each 5 ft. diameter, placed 25 ft. apart in centre longitudinally, the front and back cylinders being surmounted by cast iron beams, from which masonry and brick arches were turned. Longitudinal metal sheet piling, to the level of low water, was driven in the form of a segment between the front cylinders, but proved too weak for the increased depth of water, after the bed of the river had been dredged out. The intervening sheet piling was done away with and a more continuous front row of cylinders substituted, 10 ft. 9 in. centre to centre with elliptical cylinders intervening. These likewise proving too weak, a close row of 6 ft. front circular cylinders was tried, the back cylinders remaining as before, but tied to every alternate front cylinder by a wrought iron band passing round them. The same method was adopted under a large grain warehouse built on the quay. Finally, in the rebuilding of part of the 1840 wall, well monoliths of concrete were upon the advice of the late Mr. P. J. Messent, Engineer to the Tyne Commission, sunk for the foundation of a wall constructed to give a depth of about 20 ft. at low water during tides, and this plan has since been applied to the reconstruction of all the old quays requiring renewal. The blocks are 10 ft. long, 20 ft. wide, and 37 ft. deep, with a wall 20 ft. by 10 ft., and walls 5 ft. thick, forming concrete caissons, sunk to an average depth of about 32 ft. 6 in. below low water, and are placed 2 ft. apart, the interior and also the space between them being filled with concrete. In these blocks the masonry and concrete superstructure was built. Further details respecting the formation and mode of sinking

the monolith foundations, built by Mr. W. G. Laws, City Engineer, Newcastle-upon-Tyne, will be found in a paper by his assistant, Mr. Adam Scott, published in the Minutes of the Institution of Civil Engineers, vol. cxix., page 201.

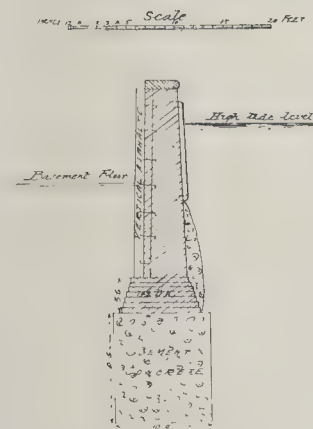
Concrete cylinders have, upon the advice of the late Sir John Coode, been employed by his successors, Messrs. Coode, Son, & Matthews, for the foundation of the abutment to the new east pier to the Outer Harbour Extension at Dover. These cylinders were cast upon a lower seating ring, 12 in. deep, to form a cutting edge, the cylinders being 7 ft. external diameter, 15 in. thick. They were cast in wood moulds with 5 to 1 Portland cement concrete, and were allowed to set at least ten days before lifting, and to season one month prior to removal from the yard to their destination. The top and bottom edges of all intermediate rings are toothed 6 in. deep, and tapered 1 in., so as to key into each other when sunk in situ. The cast-iron cutting edge shoe is bolted into the bottom ring by 1 in. bolts, let in flush at the top. The interior concrete is placed in position by means of skips, so arranged as to deposit the contents as close as possible to the concrete previously deposited. Between this abutment and the old north pier of the existing harbour entrance a sea-wall exists, built by the late Mr. James Walker as Engineer, in which a row of cast-iron sheet piles were driven at the toe of the outer slope between the wall and its apron.

Messrs. F. & H. F. Higgs built, in Upper Thames-street, a warehouse with a river wall going down about 10 ft. below the river bed, which was easily effected by means of the usual cofferdam of 12 in. piles planked each side with clay puddle between the other foundations the fact that in sinking the other foundations a brick sewer running parallel to the river, about 40 ft. from the bank and at about 15 ft. down, constructed by the District Railway Company to drain their tunnel, was encountered. At Stratford the premises built by this firm were against one of the many tidal cuts in that district, hence a river wall had to be constructed. These Messrs. Higgs managed with light piles and single planking, with tarred and tongued joints bolted outside the piles, a construction sufficient to resist quiet water of no great depth.

The Horse Shoe Wharf in Upper Thames-street, built by Messrs. Holland & Hannen, was erected in 1888 and 1889 for Messrs. Pilkington Bros., glass manufacturers, by Messrs. Francis

HORSE SHOE WHARF—

—UPPER THAMES STREET—



Chambers & Son, as architects. The frontage of this warehouse is about 82 ft., the river wall going to a depth of 30 ft. below the average high water level, the basement floor being about 6 ft. below high water level. In excavating for the foundation, the strata passed through was made ground 12 ft., wet mud, dirty gravel, old piles and previous foundations, shells and silt, lastly, clean ballast. In order to build the river wall, a coffer dam

was formed by driving in two rows of 12 in. by 12 in. pitch pine sheet piling 6 ft. apart. The piles were strapped together and the rows securely laced together with iron ties. The space between the sheeting being filled in with clay puddle, and the whole construction firmly shored from the ground at the back. A shield was provided in the dam at shore level as a precautionary measure for draining off, as the tide receded any sudden rush of water that might have accumulated within the dam through extraordinary flood or other tides. In this instance the whole area of the basement, occupying between 15,000 and 16,000 square feet, was excavated at the same time. A deep sump hole was formed, and a steam chain pump kept constantly going to keep the excavation clear of water until the permanent river wall was constructed. It may be interesting to note that while getting out these excavations, the old Kentish rag foundations of Baynard's Castle, which occupied the site in the time of Queen Elizabeth, were discovered.

The river wall of Brook's Wharf, Upper Thames-street, was built tide work by Messrs. Holland & Hannen. A sound foundation was obtained at a depth of 14 ft. below the level of the shore, but no record has been kept of the class of soil passed through. The excavation, concrete, footings, &c., were carried out in short lengths, as in underpinning, during the time the tide was out, and the work done was carefully covered up or cased in before the water reached it. The casing of brickwork &c., was in no way watertight, but was sufficient to prevent the washing action of the tide. This is an economical method of constructing a river wall, but of necessity rather slow, and can only be adopted in particular cases. In 1880 the same firm constructed a quay wall to their own property in Nine Elms-lane. The length of wall was about 100 ft., and height about 18 ft.; this was also carried out tide work as in the previous case, but is constructed entirely of Portland cement concrete. This is a very expensive form, costing between £4 and £5 per foot run complete. A diagram is also given (see lithograph sheet) of the river wall in front of St. Thomas's Hospital, Albert Embankment, designed by Mr. Henry Curry.

Mr. Matt Garbutt proposed a vote of thanks to Mr. Walmisley for his excellent paper—one of the fullest papers that had been read in that room. The paper, which could not be discussed very well off-hand, was especially interesting just now, for their attention had recently been directed to sundry very interesting failures. In his opinion they might expect other failures in the future, and it was quite time that architects made up their minds to give their first attention to structural requirements of a building as against the artistic. Mr. Walmisley had given figures as to the bearing power of soils, but he (the speaker) thought that, generally speaking, those figures were misleading when applied to small buildings. Mr. Walmisley had referred to foundations carried down to a great depth, and no doubt when they were carried well down a greater weight could be put safely upon the soil than when the foundations were nearer the surface, because there was not the same chance of a lateral spread. In London buildings of a moderate size on clay, the weight ought not to be more than two tons per square foot. He had heard of cases of factory chimneys where the load did not exceed two and a half tons, and yet settlements of a serious character had occurred. In the chimney which was illustrated, there was one objection: the inside lining was carried right up to the top, and so arranged that it could not expand without danger to the shaft. He knew a case of the inner lining being built with its upper edge confined by the brickwork of the outer shaft. The expansion of the lining lifted the upper part of the outer shell, so that, after the swaying caused by a gale, considerable lateral dislocation was found to exist at the level of the top of the lining.

Mr. J. H. Shaw seconded the vote of thanks, and said that there were one or two little points which had occurred to him in actual practice, and about which he should like to ask Mr. Walmisley. In regard to concrete for keeping water out of foundations, would it be possible to keep water out with a sufficient thickness of concrete, without using asphalt, which was so expensive? What thickness of concrete was sufficient to keep out water? Then as to piles. What material did Mr. Walmisley use for them?

He (the speaker) had used both pitch pine and English larch (with the bark left on), and he had found larch cheaper, and it was more durable. In regard to floating buildings on concrete, instead of carrying the piers right down, that could be done if the walls were balanced properly, but if they were not the building would settle unevenly. He thought that it was better to sink down piers to a good foundation.

Mr. Beresford Pite said that, in asking the lecturer a few questions, he would like to express their gratitude to Mr. Walmisley for his valuable and encyclopedic paper. They would like to know the most economical form of foundation for, say, an ordinary house of two stories on a weak soil in the country. They would also like some hints as to damp-proofing behind underpinning of party walls to keep out water. In one case, aided by a good builder, he had succeeded in doing it in slate and cement, but he doubted if that would be always possible, and he would be glad to hear of another and better material; builders sometimes said they could not do it in that material. Then, could the lecturer recommend a properly elastic and safe damp course? And was it advisable to build the abutting walls of a tower in a groove, in order to avoid what happened at the Imperial Institute, where the heavy tower dragged and caused a cavity between itself and the main building? Then as to the advantage of a concrete table; why should they not level down to the required point and at once put in the table? If the tenacity of the concrete was what Mr. Walmisley had said, surely the advisability of putting heavy legs in certain positions underneath the table seemed to be doubtful. As regards water passing through concrete, surely it was not a question of thickness, but of quality. If water would pass through 6 in. of concrete, it would pass through 6 ft.

Mr. H. H. Slatham said, in answer to Mr. Pite, that if they put a table of concrete on a very bad made soil the weight might cause it to move bodily, and that was one reason for carrying down legs. The paper they had heard that evening was one of the most valuable which had been read in that room, though it was one that could hardly be discussed without having been previously read and studied. The importance of knowing something about the site of a building before it was commenced was shown in the case of the great new church in Paris on the hill of Montmartre. Having collected a large sum of money for the erection of the church, when they began to dig for the foundations they found that the ground was soft, loose stuff, and the money which was thought to be sufficient for building the church had all to be spent on a large number of concrete pillars, which were carried down some 60 ft., and fresh subscriptions had to be appealed for. That, he thought, was a very good practical illustration of the necessity of knowing the character of the ground before the building was erected.

Mr. E. Greenop said, as to the necessity of having test holes dug, he knew of a case where a number of holes were made. The first gave ashes, and others gave spent lime, sweepings from house floors, Australian meat tins, &c. The borings were then given up, but the site was treated as follows:—A raft of concrete 18 in. thick only was put in, and underneath that about 18 in. of hard core as large as possible, old paving stones, &c. The ground was previously rolled as hard as possible, and it had answered well with some 700 or 800 tons upon it. Peat, as Mr. Walmisley had said, was a very treacherous soil. In the case of a building where a failure had taken place he discovered that it rested upon peat, which was as greasy as butter, and the walls simply slid upon it. At Smithfield, at considerable distance from the surface, he had come across one of the old plague burying pits. For a thin raft of concrete, where expense had to be considered, he had found it well to put in old steel tram rails, which could be obtained for about 60s. a ton. In regard to the piers which Mr. Walmisley referred to, with an arch placed between them to carry the walls, he suggested rolled joists put on the top of the piers, and then filled in with concrete instead, thereby obviating thrust.

Mr. E. Olander, engineer, G.W.R., Paddington, said that while engaged some years ago in constructing the viaduct for the Metropolitan extension of the London, Chatham, and Dover Railway, near the bridge which crosses the Clapham-road, two or three of some arches

over which the traffic had been running about three months, collapsed. The contractors, Messrs. Peto & Betts, were anxious to discover the cause of the failure, and after a good deal of expense and excavation, they discovered that the blue clay on which the piers of the viaduct rested had a water seam at an angle nearly parallel with the railway. It was in consequence of that water seam that the blue clay at the top, with the superincumbent weight of the viaduct and the trains, was shifted, and that the collapse occurred. He had come across other cases where the blue clay had had a water seam of $\frac{1}{2}$ in. or $\frac{3}{4}$ in. thick. In regard to carrying out cylinder work for bridge piers in rivers, he thought it was necessary to be very particular in obtaining reliable borings. He had himself been concerned in sinking cylinders for a bridge on unreliable data in respect to borings; the consequence being that some of the cylinders had to be carried down 40 ft. and 50 ft. below contract depth. With regard to holding-down bolts on to cast-iron columns, he had adopted a method which was, no doubt, very common now. Instead of the old-fashioned holding-down bolts, he surrounded the base of the column, which had a large flange, with cement concrete. Holding-down bolts had to be built into concrete or brickwork, and each bolt should pass through a wooden template, giving much trouble to adjust properly.

Mr. A. S. Flower remarked that what had been said about plague pits reminded him of an occasion when, in underpinning a wall not far from where they then were, he had come across a quantity of bones, which, it was supposed, were human. He collected some of them and took them to the Natural History Museum, where he was told they were ox bones. They had, in fact, come upon the site of an old slaughter house. As an illustration of how the alarming nature of an incident might vanish, he might mention the case of a certain house, in the basement of which water kept coming in from under the party wall. The cause of the trouble could not be discovered at first, but was generally attributed to an underground spring, and he anticipated a good deal of trouble and expense; but, fortunately, he got the idea from Mr. Rogers Field, who had drained the adjoining house, that there might be a leakage in the water pipes in that house. This proved to be the case.

The Chairman, in putting the vote of thanks, said that he would have liked Mr. Walmisley to have said more about the shrinkage of clay, and also to have dealt with more ordinary sites than those of great warehouses, &c. In the suburbs of London, a considerable amount of damage was done during a dry summer to houses which were built on slight foundations. The shrinkage of the clay did an enormous amount of mischief. He would also have liked to have heard a little more with regard to the treatment of sites by the riverside, on the principle of gridiron foundations. More iron was being introduced into riverside foundations than formerly, and the old pile system had been quite done away with. It was interesting to know that three bridges remained—London, Waterloo, and Westminster bridges—which were constructed upon wooden piles; and judging by the time previous bridges had lasted he supposed that these three would not last more than another fifty years, which was a pity. The bridges that were built now, if not so good in design, would last longer, he believed, as the foundations were put in on a better system.

The vote of thanks having been put and carried unanimously.

Mr. A. T. Walmisley, in reply, said in regard to keeping water out of foundations as much depended upon the quality of the cement used as upon the thickness of the concrete adopted. As to the material for piles, he had used pitch pine largely; it could be got in long lengths and fairly square in section. As to the most economical form for foundations, a great deal depended upon position and circumstances; it would be impossible to lay down a typical form that would apply in every case. As to a damp-proof course, no doubt it could be obtained with slate and cement, but in extensive buildings subject to heavy pressure, lead courses or possibly an asphalt lining would be essential. As to whether it was advisable to have a groove in a high tower in the case of settlement, he certainly thought it was advisable to have a straight joint in a lower where the pressure on the foundation produced by that tower, was greater than

the pressure produced by the building adjoining it, upon either side. In the case of the Barrow Town Hall there was a settlement, with the introduction of huge cracks in the side walls through not having had a straight joint all the way down. Wherever there was greater pressure on one part of a foundation than another, it was necessary to make this provision. In regard to the suggestion that an increased thickness for the raft of concrete should be provided in order to dispense with the use of legs, as was pointed out by Mr. Slatham, the pillars or legs were introduced to prevent bodily movement downwards. It was necessary to have such legs under the points where the principal weights came. He thought the suggestion for a concrete lintel from pier to pier in the place of brick arches was feasible. The remarks of Mr. Olander were interesting, and his method of burying the base of a column in concrete was a good one where there was a downward pressure only to be met. But in the case he (the speaker) mentioned of the Carlisle Market the roof columns were anchored down to a concrete foundation, and the bolts came into tension. In such cases of tension produced by lateral wind pressure, it was well to introduce the metal to take that tension. In regard to clay and its shrinkage, in one part of his paper he drew attention to some houses in the Midlands, where clay came to the surface and the sites cracked. This was the case at Denmark Hill, as described in the paper. He had not referred to the question of gridiron foundations as applied to new premises on the Victoria Embankment, because Mr. Ellis, the architect of the *Daily Mail* buildings, where this method had been adopted, intended to read a paper on the subject himself. In regard to the length of time the three bridges mentioned by the chairman would last, he thought there was no need to fear that with their deep foundation they would give way in fifty years' time.

List of Officers, 1898-99.

The Chairman then read the report of the scrutineers appointed to deal with the voting papers in the election of officers for the ensuing year. The number of sealed envelopes sent in was 292, and the number of valid voting papers was 285. The result of the election is as follows:—

President, Mr. G. H. Fellowes-Pryne; vice-presidents, Messrs. P. J. Marvin and A. S. Flower; committee, Messrs. R. S. Balfour, H. O. Creswell, Beresford Pite, T. W. Aldwinkle, junior, W. A. Pite, W. H. Seth-Smith, Banister F. Fletcher, A. H. Hart, Matt Garbutt, and H. A. Satchell; hon. treasurer, Mr. Hampden W. Pratt; hon. librarian, Mr. C. H. Freeman; hon. secretaries, Messrs. E. H. Sim and G. B. Carvill.

On the motion of the Chairman, a vote of thanks was accorded to the scrutineers, Messrs. E. Greenop, W. W. Biss, A. Smithers, C. H. Brodie, T. C. Yates, W. A. Jekylls.

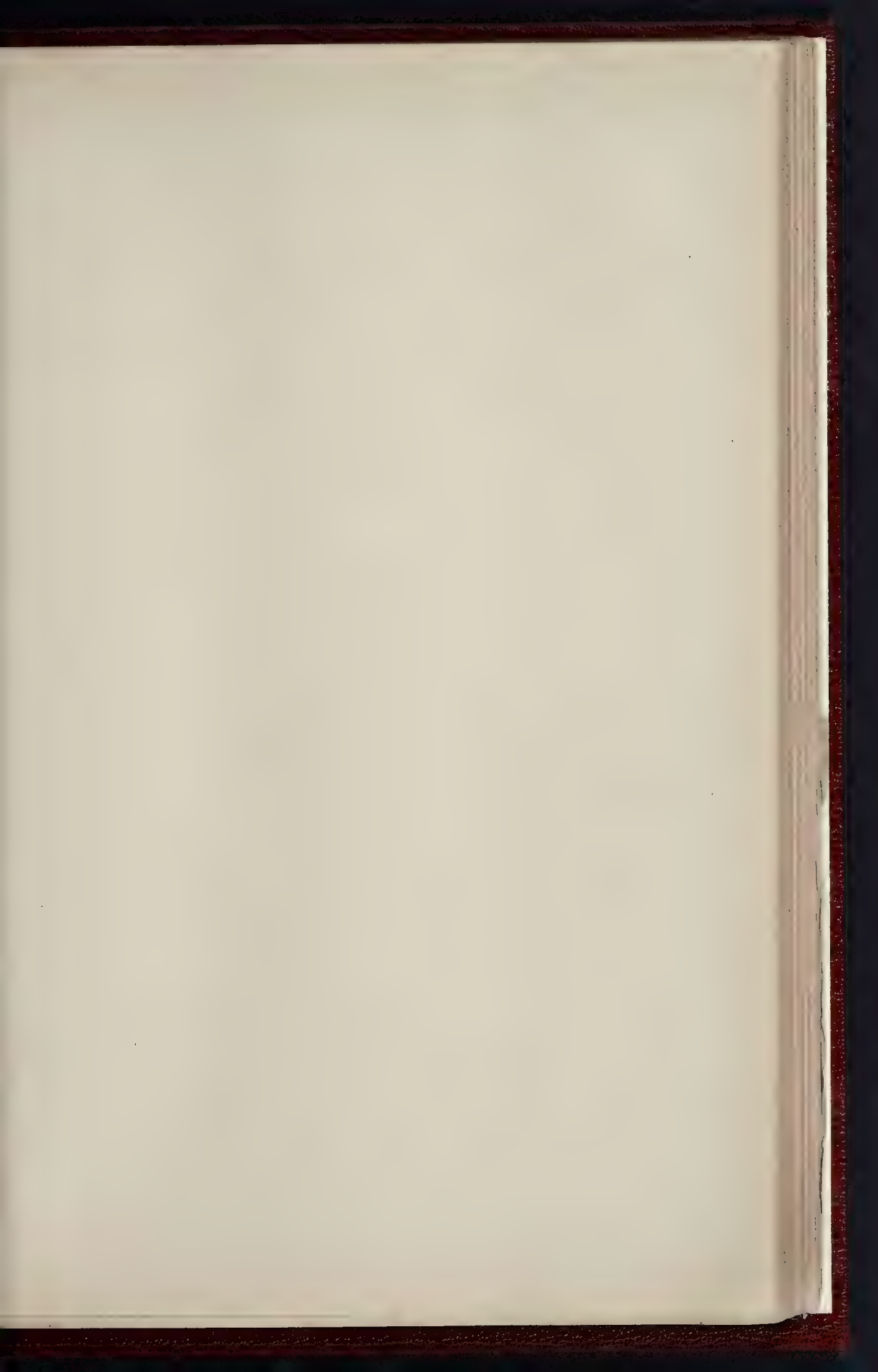
Mr. Beresford Pite then proposed a hearty vote of thanks to the President for his services during the past year. Mr. Pratt had done more than any other President within living knowledge, for he had visited all the classes of the Association, had kept himself in touch with the Studio, and had sacrificed a great deal of his time most generously for the good of the Association. They were consequently in a healthier state than ever, and it would be found when the annual report was issued that their finances and classes had flourished. They owed a hearty vote of thanks to their excellent and hard-working President for the admirable manner in which he had performed his duties.

Mr. G. H. Fellowes-Pryne, President-elect, said he desired to cordially second and warmly support the vote of thanks. A more thoroughly business man than Mr. Pratt had, he thought, never been on the committee, and in addition to his duties as President they must not forget that Mr. Pratt had also acted as their Treasurer.

The vote of thanks having been heartily agreed to.

Mr. Pratt, in reply, said he had done no more than his predecessors in that chair; viz., endeavour to advance the interests of the Association to the best of his ability, and he had endeavoured to keep in close touch with all the work of the Association by visiting the classes and the Studio, and by attending the Visits.

On the motion of Mr. E. Howley Sim, seconded by Mr. G. B. Carvill, a vote of thanks

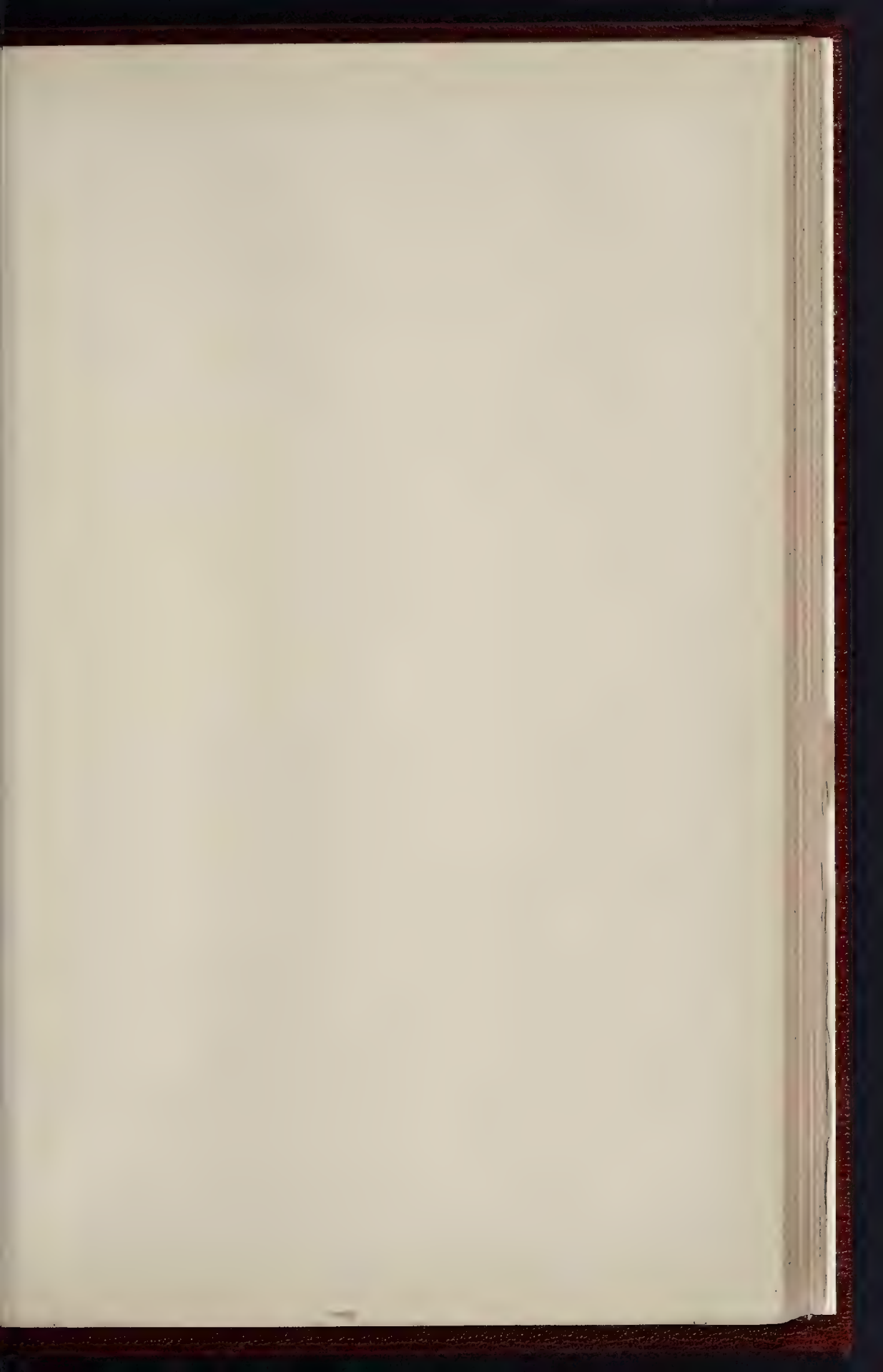


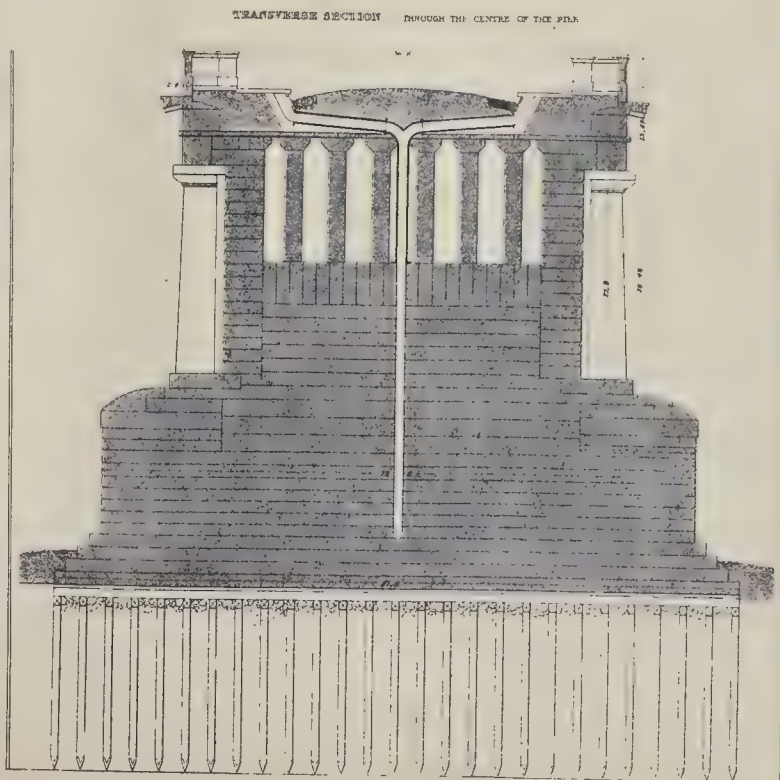
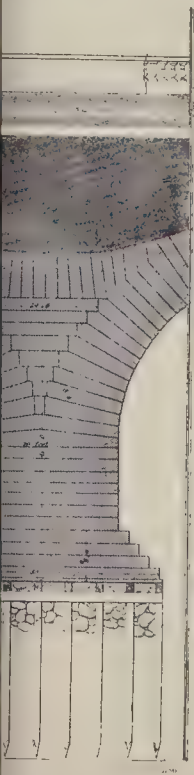
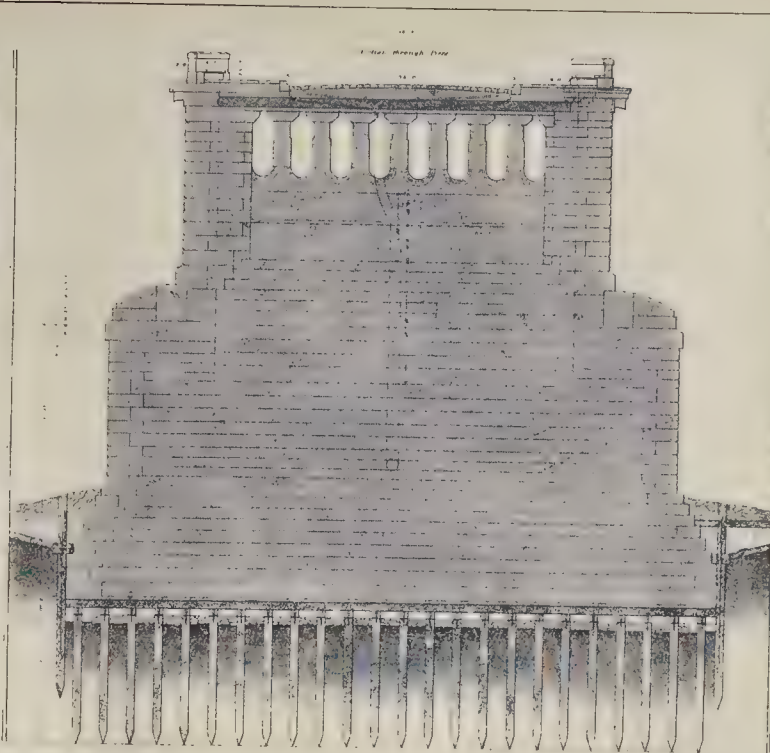
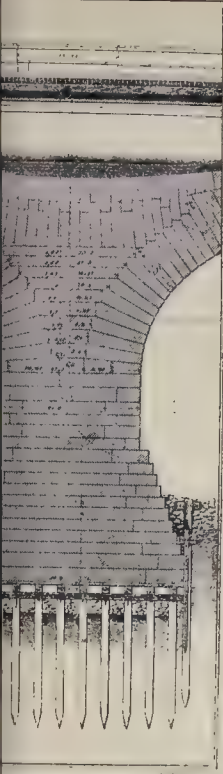


NEW FREE CHURCH AT THE KELVIN, G



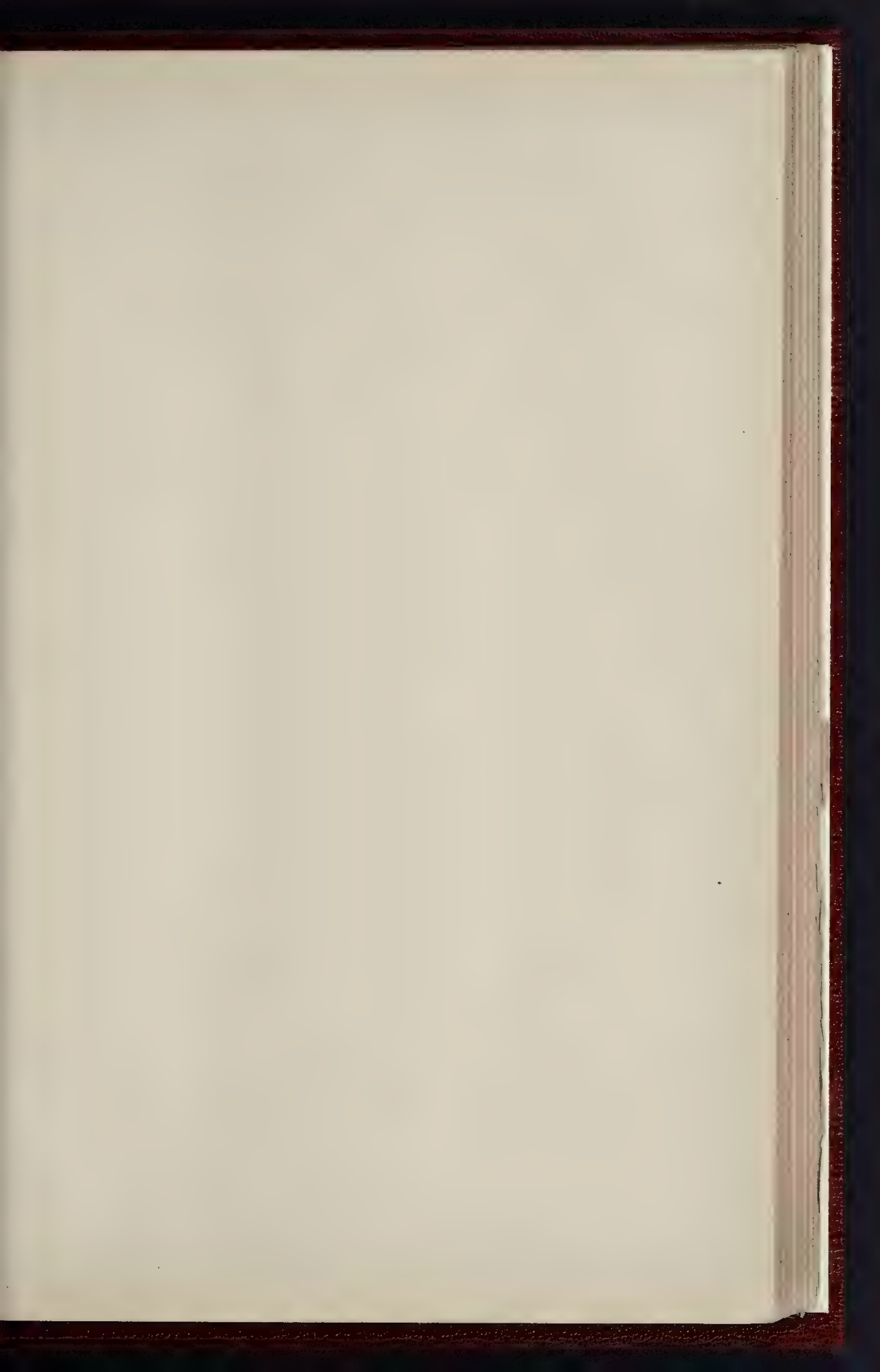
PHOTO SPRAGUE & CO. 4 & 5 EAST WARDING STREET PRINCE LANE E.C.



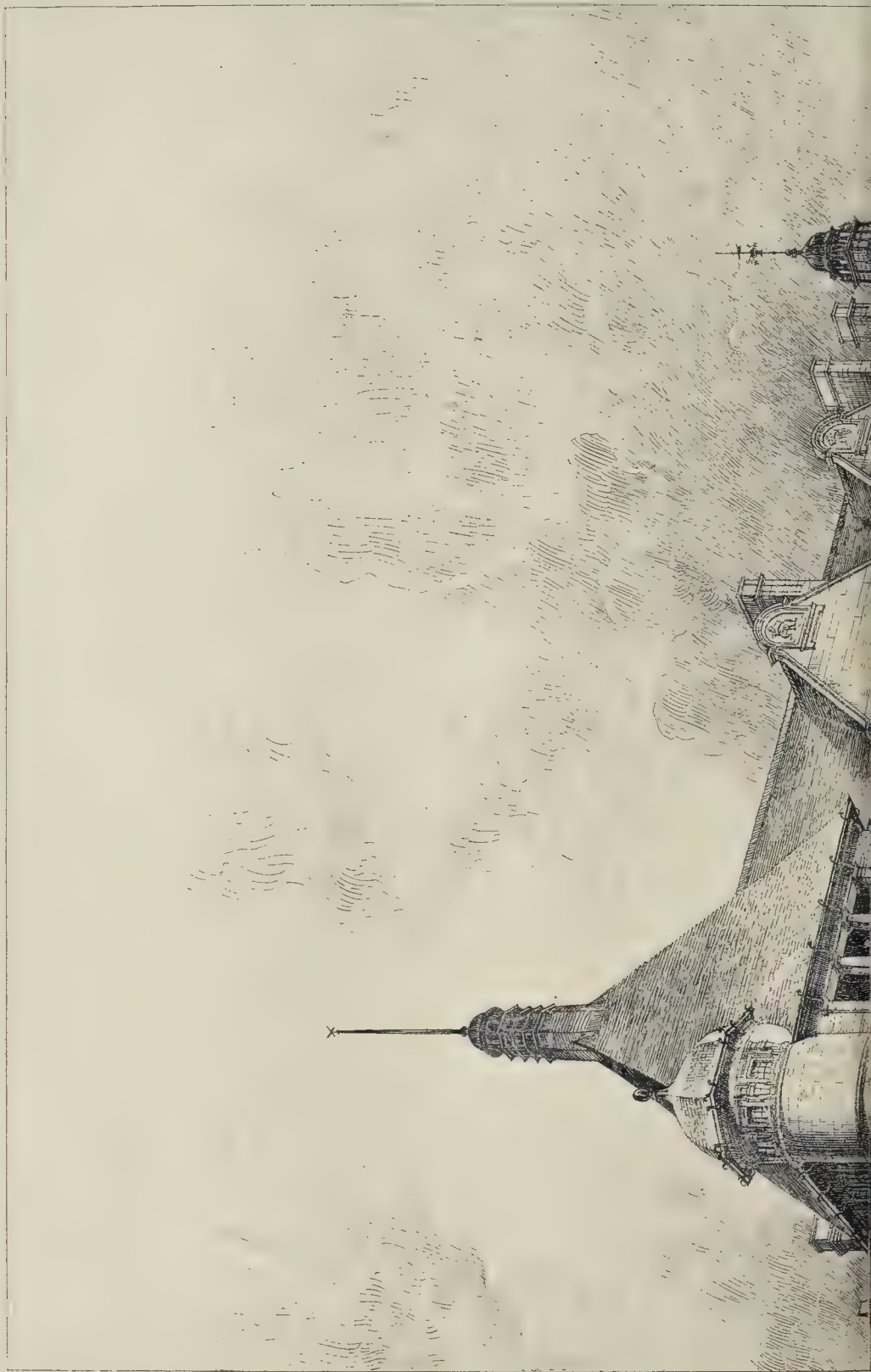


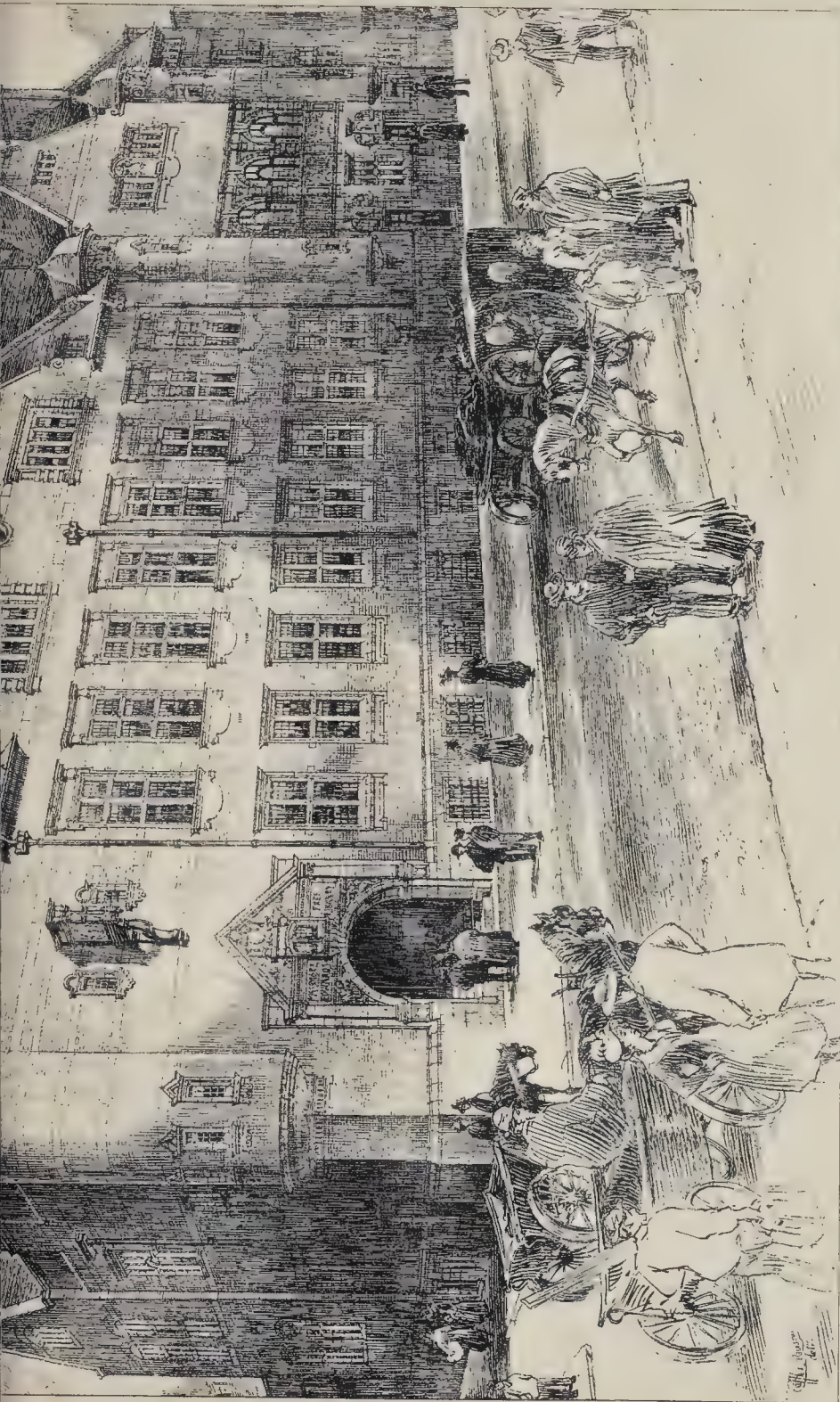
NA PHOTO SPRAY & L. A. S. EAST-HARDING STREET, NEW YORK

TERLOO BRIDGE, SHOWING PILE FOUNDATIONS AND CONSTRUCTION OF CENTERING
DATIONS," BY MR A T WALMSLEY



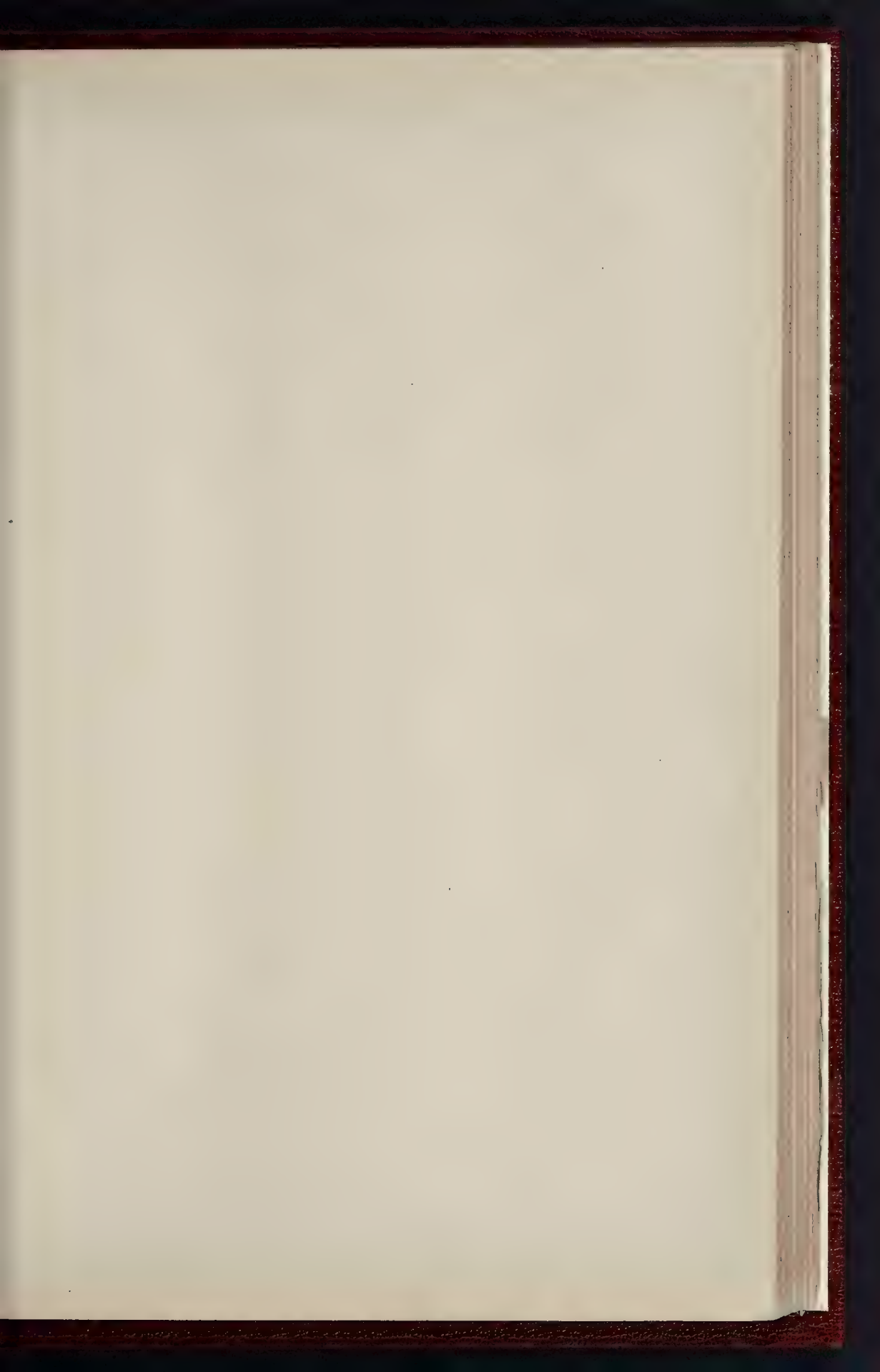
THE BUILDER, MAY 28, 1898





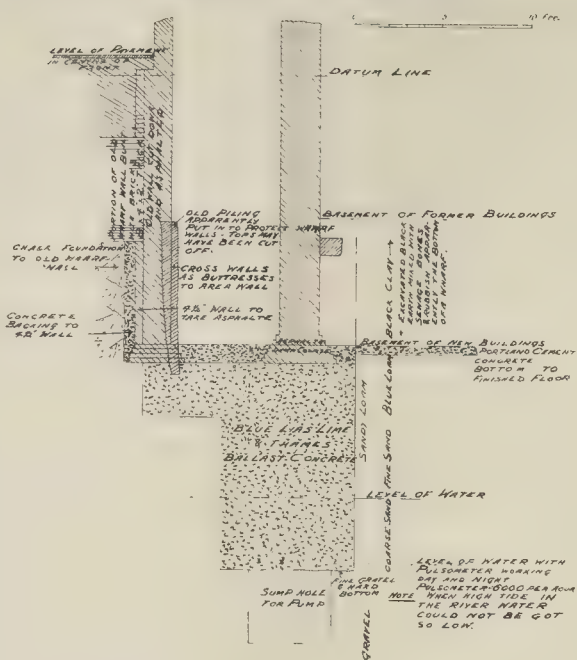
PRINTED AND SOLD BY J. H. HARE, A.R.B.A., ARCHITECT

PUBLIC LIBRARY, SHOREDITCH.—MR. H. T. HARE, A.R.B.A., ARCHITECT

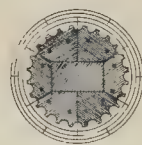


INSTITUTION OF MECHANICAL ENGINEERS WESTMINSTER

SECTION OF FOUNDATIONS TO FRONT WALL

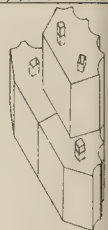


NELSON'S COLUMN

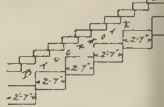


Sectional Plan A-A

View of face blocks



GROUND LINE



BOROUGH MARKET-SOUTHWARK
FOUNDATIONS TO ROOF COLUMNS

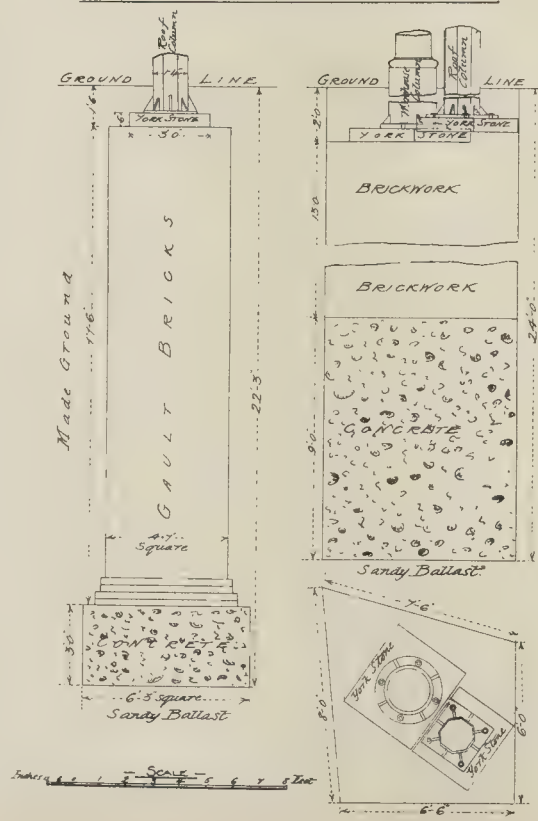
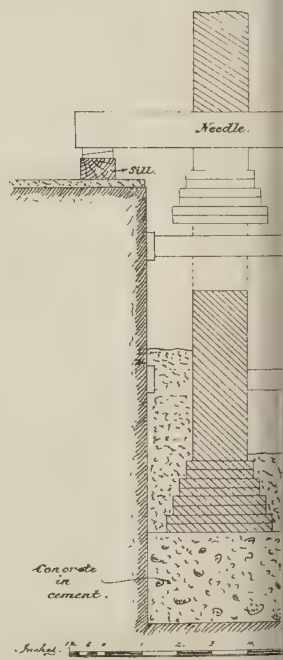
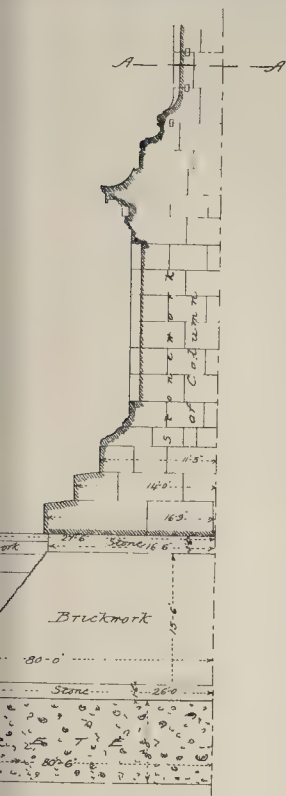


Diagram of Underpinning



FALGAR SQUARE, LONDON.



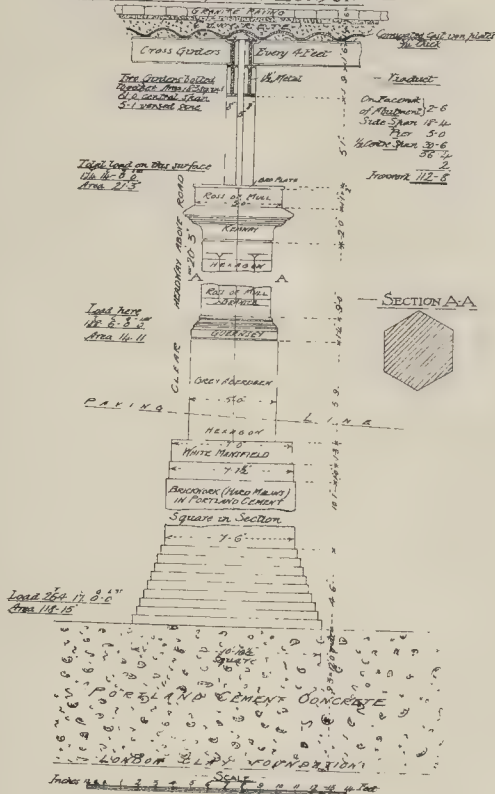
New Basement.



Earth
to be
removed.

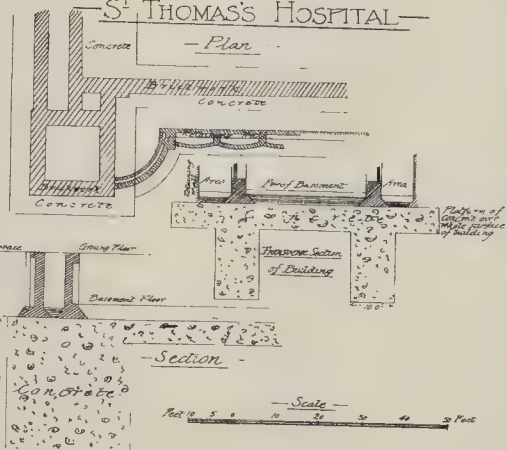
1/4" = 1' Scale.

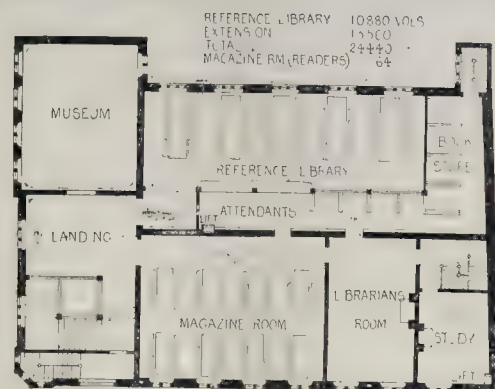
ELEVATION OF CENTRAL PIER
FARRINGTON STREET BRIDGE
HOLBORN VIADUCT, LONDON.



ST THOMAS'S HOSPITAL

Plan

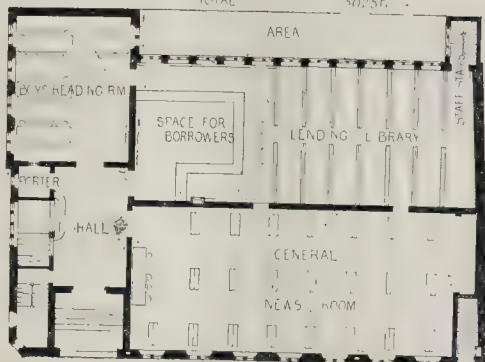




FIRST FLOOR PLAN

PUBLIC LIBRARY
SHOREDITCH

BY-READING ROOM	36 READERS
GENERAL READING ROOM	93
LENDING LIBRARY	26406 VOLS
EXTENSION	27667
TOTAL	20736



GROUND FLOOR PLAN

Illustrations.

NEW FREE CHURCH AT THE KELVIN,
GLASGOW.

THE site of this church is the steep bank on the north side of the River Kelvin, where Belmont Bridge crosses it. The floor of the church is at the level of the bridge, from which is its main entrance. Access to the hall below it, and also to the church, is from a road running under the road which continues the traffic of the bridge northwards. This lower road leads to the district on the east, where there is a missionary congregation, for which the new buildings are intended, under the care of the Free College Church.

The style of the buildings is Scotch fifteenth-century Gothic, which has many of the features of French Gothic of the same period, due to the closer connexion of Scotland at the time with France than with England. The design of the crown on the tower is modified from the crowns of St. Giles, Edinburgh, and of King's College, Aberdeen. The interior is arranged with a view to good acoustics. Arcades of stone piers and arches divide the nave from the low aisle on the south and form a transept containing a gallery on the north. The apse is groined with stone ribs and filling in of concrete.

The church will be built of the red stone now generally used in Glasgow, which retains its colour better in the atmosphere of the city

than the white stone which formerly was generally used.

Mr. J. J. Stevenson is the architect. The drawing is exhibited at the Royal Academy.

SHOREDITCH PUBLIC LIBRARY.

This library, which has been recently opened, is situated in Pitfield-street, Hoxton. It forms a part of the extensive scheme of the Shoreditch Vestry, comprising electric lighting station, dust destructor, and public baths.

The materials used for the elevations are red bricks and buff terra-cotta dressings with tiled roofs. The whole of the floors are of fireproof construction. The heating is by exhaust steam derived from the engines of the electric lighting station. Plans of the floors are appended.

Mr. H. T. Hare is the architect. The drawing is exhibited at the Royal Academy.

ILLUSTRATIONS TO PAPER ON
FOUNDATIONS.

Two of our lithographic sheets are devoted to reproductions of some of the illustrations to Mr. Walmisley's important paper on "Foundations as Applied to London Buildings," read at the Architectural Association last week, and printed in full in this issue.

The sections of arches and piers of London and Waterloo Bridge, showing the piling in the foundations, though they give nothing that is new to engineers and architects, may be of interest to students who heard the paper, as also the representation of the construction of the centres for these large arches.

The other sheet contains diagrams made specially by Mr. Walmisley for his paper; they are all referred to in the course of the paper.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.—The thirteenth and last meeting of the present session of the Discussion Section of the Architectural Association was held at 50, Great Marlborough-street on the 18th inst. Mr. Matt. Garbutt, Chairman of the Section, occupying the Chair. After the usual question time, Mr. T. W. Aldwinckle introduced the subject for discussion, viz.: "The proposed by-laws of the L.C.C. with respect to house drainage." These by-laws had been prepared under powers given by Section 202 of the Metropolis Management Act, 1855. An anomalous state of affairs existed, because, under Sections 75 and 76 of the same Act there were many and diverse regulations in force in the different vestries of London, and it was very doubtful whether as by-laws these regulations could be rigidly enforced. The duties of enforcing and interpreting them and dealing with all matters arising out of them were vested in the hands of the Medical Officers of Health, of whom it might be said that their estimate of their powers varied inversely as the square of their knowledge. To remedy this the L.C.C. had thought it advisable to adopt a uniform set of by-laws for the whole of London. Drafts of the laws had been put before the various sanitary authorities, and had been discussed by the Royal Institute of British Architects. Mr. Aldwinckle then took the by-laws seriatim and commented on each. By-law 2, dealing with rain-water pipes, he thought unduly severe, as it precluded the method of discharging a vertical rain-water pipe over an open channel leading to a trapped gully about 1 ft. distant. He could not see any objection to allowing a rain-water head to take a bath or lavatory waste where convenient; it prevented the possibility of the gully-trap being unsealed in dry weather. There was nothing in the by-laws to deal with surface water from yards or basement areas. By-law 3, as to materials for drains, was too general; cement for jointing should be specified to be cooled; the neglect of this was the cause of many broken collars; "a suitable fall" was too indefinite; "concrete not less than 6 in. thick" should also specify a minimum width. There was nothing to specify the proper jointing of iron pipes. Drains were only to be allowed under buildings where any other mode was impracticable. Who was to decide this? It might, under circumstances, be practicable, but it cost three or four times as much. All drains under buildings should be of iron, ventilated at each end. In By-law 5, dealing with inspection chambers, a minimum thickness of walls

was accorded to the members of the retiring committee.

Mr. F. G. F. Hooper proposed, and Mr. E. Howley Sim seconded, a vote of thanks to Mr. Pratt as treasurer, and this having been agreed to, the Chairman briefly replied.

On the motion of Mr. B. F. Fletcher, seconded by Mr. Matt. Garbutt, a vote of thanks was passed to the librarians, Messrs. C. H. Freeman and E. W. M. Wonnacott, coupled with thanks to Mr. Wonnacott for his services as lanternist.

Other votes of thanks were cordially passed to the hon. secretaries, Messrs. Sim and Carvill; to the Royal Institute of British Architects for the use of their Meeting-room for the meetings of the Association; to the Visitors of the School of Design; and to the Technical Education Board for the facilities granted to the Association in connexion with workshop demonstrations.

The meeting then terminated. The Annual Dinner of the Association took place on Thursday at the Holborn Restaurant.

BUILDING TRADES EXCHANGE FOR HUDDERSFIELD.—At the invitation of the Master Builders' Association of Huddersfield, recently, Councillor Edwin Naylor, President of the Halifax Building Trades Exchange, accompanied by his secretary, Mr. A. E. Dalzell, gave an address on "The Advisability of Forming a Building Trades Exchange in Huddersfield." The meeting decided to form such an exchange. Votes of thanks to the deputation were passed. The Exchange at Halifax now numbers 300 members; Bradford, 600; and Keighley, 200.

should be specified. There was nothing to say what should be done in the case of a house having no forecourt or basement. Was the inspection chamber to go under the public pavement or in the rear of the building? By-law 6, dealing with ventilation of drains, allowed two alternative systems, but the second was only allowed if the first was impracticable. Surely one should be allowed to choose which. There was a serious element of danger in low-placed inlets. In By-law 8 an important alteration in respect to soil-pipes was to be noticed. A soil-pipe need only be placed outside a building "wherever practicable." Only drawn lead and cast-iron pipes were allowed; but why was wrought-iron not included? Having dealt with the remaining laws, referring to anti-siphonage pipes, slop sinks, the maintenance of drainage, penalties, &c., Mr. Aldwinckle concluded his paper by remarking that apparently these by-laws were intended to apply only to new buildings, but in his opinion they should also apply to the redrainage of old buildings. They should also contain some provision as to the depositing of plans. If these by-laws become law they would do away with much confusion and difficulty, and would confer a blessing on the architect, and in due time on the whole of London. The discussion was carried on by Messrs. Satchell, Jacob, Strange, and Crawfurth Smith. Mr. Max Clarke said the subject was a more important one than many seemed to think. Under the Act of 1862 the Vestries had made regulations for house drainage, or they had not, just as had pleased them. The L.C.C. had made by-laws under the Public Health Act of 1861, dealing with sanitary work above ground, but they had delayed making regulations for drainage underground. These by-laws had been in print a considerable time, and had been discussed by sanitary authorities and other bodies. They had now been submitted to the Local Government Board, and as there seemed to be a little friction in that quarter, it would probably be a considerable time before they were approved, and became law. Mr. Clarke said he objected to by-laws which would bind one to particular methods for perhaps twenty years. He believed that in twenty years present methods would be obsolete. They should have a wider scope. Was it proper that similar hard and fast by-laws should apply to the West End and a neighbourhood like Clapham? He objected to any subsoil drainage going into the soil drain in the method described in the by-law. Six months of the year there would be no water in the traps. The system of ventilation given in the by-laws was bad. A mica flap was useless in six months.* The Chairman, in summing up, said there was much to be said against the L.C.C. making by-laws for the whole of London. The different districts required different treatment. By-laws should allow scope for improved methods. For iron pipes a properly-made rust joint was better than lead. The election of officers for the ensuing session then took place, with the following result: Chairman, Mr. H. J. Leaning; Vice-chairman, Mr. Bonner Hopkins; Secretaries, Messrs. C. H. Strange and C. V. Johnson.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.—The following is the list of committee and officers elected for the session 1898-9:—President, Mr. J. Howard Pentland, R.H.A.; vice-presidents, Mr. Joseph Holloway and Mr. George Sheridan; committee, Messrs. H. Allberry, F. Batchelor, T. Coleman, T. E. Hudman, A. I. McGloughlin, L. O'Callaghan, Cecil Orr, R. C. Orpen, and M. J. Tighe; hon. treasurer and registrar, Mr. F. G. Hicks, 5, St. Stephen's-green; hon. librarian, Mr. Joseph Geoghegan; hon. secretaries, Mr. R. M. Butler (Dawson Chambers, Dublin) and Mr. A. W. Moore (183, Gt. Brunswick-street, Dublin); hon. auditors, Mr. T. F. Slevin and Mr. J. W. Eoucher.

LIVERPOOL ARCHITECTURAL SOCIETY.—The annual meeting of the Liverpool Architectural Society was held on the 16th inst. in the new offices of the Law Library, Cook-street, Mr. W. E. Willink (President) in the chair. The annual report, read by Professor Simpson (honorary secretary), stated that the present membership was 131, compared with 121 last year. The Council was pleased to state that the increase in the number of members attending the meetings referred to in last year's report had been fully maintained, and it was hoped that more of the younger members might be induced to read papers and join in the dis-

cussions. The report, as well as the financial statement, read by Mr. Dod, were passed. There is a balance in hand of 25l. in favour of the Society's funds, and of 42l. in regard to the library account. The following officers were then re-elected:—President, Mr. W. E. Willink, M.A.; vice-presidents, Mr. W. Owen and Mr. J. Woolfall; joint secretaries, Professor F. M. Simpson and Mr. Arnold Thorneley; honorary treasurer, Mr. James Dod; and honorary librarian, Mr. J. W. Blakey. The new council consists of the following:—Fellows, Messrs. C. J. Anderson, H. L. Beckwith, J. W. Blakey, T. E. Eccles, Henry Hartley, William Owen, J. Woolfall; Associates, Messrs. F. E. P. Edwards and E. P. Hinde.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At a meeting of this Association, held on Wednesday, the 18th inst., at the rooms in Sackville-street, Mr. J. Chalkey Gould in the chair, a paper by Mr. Cann Hughes, on "the Parish of Gressingham, co. Lancs.," was read by Mr. Rayson, Vice-Treasurer, and illustrated by photographs. Gressingham is situated about seven miles from the old county town of Lancaster, in a neighbourhood rich in archæological remains. In the belfry of the church of Cloughton, close to the ancient Hall of the same name not far from Gressingham, is preserved the oldest dated bell known in England. The author in the course of his researches observed no fewer than six forms of spelling the word "Gressingham," and in the Domesday Survey the township appears as Gersicstone; it formed part of the Saxon manor of Wiletone, belonging to Earl Tosti. The church of Gressingham is frequently mentioned in the Charters, as set forth by Mr. Roper in his "Materials for the History of the Church of Lancaster," which is the mother parish; and a curious local tradition exists that for many centuries the wax candle ends from the church of Lancaster were the perquisites of the incumbent of the daughter church at Gressingham. The church is dedicated to St. John the Evangelist, and consists of nave, chancel, north aisle at west tower, and is mainly of the Perpendicular style of architecture, although there are portions of the ancient Norman church existing—in particular, a fine south doorway, of three arches, recessed in the thickness of the wall. Over the door on the south side is a portion of a quaint old organ of diminutive size, which once did duty in the service of the church. The earliest curate of Gressingham of whom the author could find any trace, was one John Fawcett, whose will was found at Richmond in 1590, the will being preserved at Somerset House. The parish records mention several of the Ministers during the Commonwealth period, one of whom is quaintly called the "painful minister," meaning painstaking. There are many old houses and halls, most of which are now farmhouses, in the immediate neighbourhood and in the village of Gressingham. Near the Vicarage is a cell, once the residence of a hermit, and still retaining its ancient windows. In the discussion on the paper it was remarked that the right to the candle ends of the church of Lancaster was no insignificant item in those days, considering that they were of wax, and that the manufacture was restricted to certain persons under heavy fine for infringement of their right.

COMPETITIONS.

WOLVERHAMPTON NEW WORKHOUSE.—The documents with regard to the competition for designs and plans for the new workhouse, at New Cross, Wednesfield, have been issued by the Workhouse Committee of the Wolverhampton Board of Guardians. It has been decided not to have an open competition for the appointment of architect, but that the competition shall be limited to three architects, to be selected by the Guardians, who are recommended to select Messrs. Magnall & Littlewoods (of Manchester), Mr. W. Doubleday (of Birmingham), and Messrs. Marshall & Turner (of Nottingham), to compete, on the terms that the author or authors of the designs and plans selected by the Guardians have the appointment of architect at the usual fee of 5 per cent. upon the outlay authorised by the Guardians, to include all fees and extras, and that each of the other two competing architects be paid a sum of 100l. for their fees and expenses.

TOWN HALL, OUNDLE.—In the recent competition for a Town Hall for Oundle, as a Diamond Jubilee Commemoration, the design bearing motto "Nene" was selected. This was by Mr. J. B. Corby, F.S.I., of Stamford. There were nine sets of designs submitted.

LONDON BUILDING ACT: TRIBUNAL OF APPEAL CASE.

At the Surveyor's Institution on Wednesday, the Tribunal of Appeal under the London Building Act, 1884, sat to hear an appeal by Messrs. Lawrence & Sons, under Section 42 (ii) of the Act, on behalf of Mr. Charles Gillett, against disapproval of and the refusal of the London County Council to sanction (in the exercise of its powers under Section 42) certain plans dated March 29, 1898, for the erection of two blocks of dwelling houses, not abutting upon a street, and adapted to be inhabited by persons of the working class, at the rear of Nos. 293 to 315, Hornsey-road, with a gateway entrance approach, 12 ft. wide, between Nos. 303 and 305. The members of the Tribunal sitting were Messrs. A. Cates (chairman), Hudson and Penfold.

Mr. A. F. Wootten, barrister (instructed by Messrs. Lawrence & Sons) appeared for the appellant, and Mr. Seager Berry, from the Building Act Department of the London County Council, for the respondents.

Mr. Wootten said that, on looking at the terms of the Council's refusal, he was really at a loss to ascertain the precise grounds upon which the application had been refused. The application as originally framed on behalf of Mr. Gillett, contained "two dwellings" as the description of the building scheme, but this was altered by the Council into "two blocks of dwelling houses." That drove him to the conclusion that the Council objected to the plans because the proposed buildings were treated as "houses" instead of "blocks of houses," and that on this ground the application did not come within the proviso. At both the rear and the front there were adequate open spaces, the height of the building was the minimum prescribed by the Act for dwellings of this class. Mr. Wootten called Mr. W. M. Lawrence, architect of the proposed building, and he explained the details of the plans. It was, he said, proposed to erect two houses, named "Mayfield House" and "Nightingale House," which were adapted for occupation by several tenants of the working classes.

Mr. Seager Berry elicited that three entrances to each building were provided for, and by these entrances access could be obtained to all parts of the buildings. He admitted that he had not obtained a certificate from the Superintendent Architect (under Section 46) officially determining which was the front and which was the rear of the proposed buildings. Witness explained that before that morning it had never been suggested to him that the rear and the front of the building should be officially determined. In fact, in his original plan he inserted the word "rear" to what he regarded as the rear of the premises, and he certainly was under the impression that the Council had adopted his definition as to what was the rear of the buildings.

Mr. Seager Berry asked the witness if he could give any instance of a street (or) way, 20 ft. wide, ending in a *cul de sac*.

Mr. Lawrence replied that he could not off-hand find one that had been made since the passing of the Act.

Mr. Charles Ernest Clarke, clerk to the previous witness, was called to speak as to an interview with one of the responsible clerks in the Building Act Department, to whom he applied for information respecting the grounds upon which the application was refused.

Mr. Seager Berry submitted that evidences as to what a clerk at Spring-gardens might have said, was not admissible.

Mr. Wootten urged that as they were not dealing with a jury, but a tribunal of experts, the statement of a person in authority under the Council would be of material assistance if not strictly in order.

The Chairman ruled that they could not accept such evidence.

Mr. Seager Berry, in stating the case for the respondents, said that as a general principle—as laid down by Part 5 of the Act—there should be means for a double current of air in the streets upon which a building abutted. In this instance they had buildings with three dwellings on each floor, so constructed as to form, technically at least, one building.

Now, if the contention of the appellant were upheld, there would be nothing to prevent Mr. Gillett from putting up off this 12 ft. way ten or a dozen blocks. Fortunately, Parliament, foreseeing that a man might ingeniously put up block after block behind, had safeguarded the Act by Section 46, which laid down that "in any case where it may be necessary the Superintendent Architect shall determine which is the front and which is the rear of a building, such determination to be evidenced by a certificate. Any person dissatisfied with such a certificate may appeal to the Tribunal of Appeal." He put it to the Tribunal that the space to be provided at the rear of any premises could not be decided until it was settled which was the rear. In this case no certificate under Section 46 had been obtained.

* Is it ever useful at all?—Ed.

Mr. Wootton contended that this point could not have been in the mind of the Council when they refused to sanction the plans. A reference to the correspondence clearly showed this. He would submit, moreover, that his friend's objection was entirely out of Court, and for this reason. The plans submitted bore the word "rear" and no objection having been taken at the time, the Council was now bound by these plans in respect to the definition of front and rear. Section 46 obviously contemplated that in the case of disagreement as to definition of "rear," the Superintendent Architect should be appealed to. The Council did not intimate that it disagreed with the applicant's definition; hence no necessity arose for obtaining the certificate; and no necessity having arisen, the absence of a certificate could not be now urged against the appellant as fatal to his appeal.

Mr. John Hebb, F.R.I.B.A., Assistant Architect to the London County Council, was called for the respondents and gave the technical grounds upon which he reported adversely upon the application of the appellant. He considered that there was a colourable attempt to conform to the letter of the Act, while ingeniously contravening the spirit of it. No doubt at the time he considered the question of the front and rear; but he was not called upon to report upon it.

Dr. Hamer, Assistant Medical Officer to the London County Council, said that having inspected the site and studied the plans he considered the scheme most objectionable from a sanitary point of view. Put briefly, the scheme was to place blocks of buildings on a narrow strip of land, lying between the backs of two rows of houses, and to create, as an approach, a narrow passage way. All the conditions were against the free circulation of air. He feared that the erection of the dwellings would be prejudicial to health, and bring them within the operation of the Housing of the Working Classes Act.

After a brief deliberation the Tribunal dismissed the appeal, but made no order as to costs.

Mr. Wootton asked the Tribunal to state a case as to the construction placed upon Section 46.

The Chairman: We find against you on the merits.

Mr. Wootton contended that the Tribunal could not find against him on merits, but only on law. Eventually, the learned gentleman was requested to make a written application to the Tribunal.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. T. McKinnon Wood, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Chelsea Vestry 5,800*l.* for paving works and the construction of a river wall; the Hammer-smith Vestry 17,575*l.* for paving works and street improvements; the Shoreditch Vestry 19,400*l.* for the erection of working-class dwellings; and the Strand District Board 4,400*l.* for paving works.

Hanwell Asylum.—The adjourned report of the Asylums Committee stated that the Committee had received a report from the Hanwell Asylum Sub-Committee, stating that the sum of 1,000*l.* voted by the Council for the improvement works, would be exceeded by a sum of 26,300*l.* In the report of the Asylums Committee, the following statement is made:—

"We fully appreciate the reasons offered by the engineers for delay in submitting reliable data, viz., the heavy and exceptional work put upon them in connexion with the designing of the temporary buildings recently completed for 400 additional patients, the plans for these having to be prepared at great speed to meet the pressing exigencies of the County for asylum accommodation, and which interfered with the other work. We also recognise the fact that the original estimate of the engineers, relating (as much of it did) to work most difficult, if not impossible, to estimate, was liable to be exceeded by the causes named, e.g., 'gutting and making good' of buildings, 'extras due to foundations,' also by increased rates of pay to workmen, 'increase in price of bricks,' 'loss due to prolongation of job by season of strikes.' These being 'unknown quantities,' it is not a matter of surprise that such excesses should have arisen. From the first it was strongly felt that as the workmen would have to be employed in close proximity to patients, it would be most undesirable to let the work be done by a contractor, as his men would not be directly under our control. In addition to this, all through the work it has been necessary to consult the convenience of the asylum and the safety of patients, and in this way the engineers have been more or less hindered. The work already completed amounts to 37,592*l.* We may further remind the Council that the scheme will provide accommodation for ninety-four beds, in addition to the ordinary number, 183 beds in the objectionable basement dormitories will be abolished,

and proper day-room accommodation which did not exist will be afforded for 750 patients. In conclusion, we may add that the Commissioners' alterations were wholly by way of improvement of the scheme and for the benefit of the patients, and it can be safely stated that the cost of the work already actually carried out is not excessive, and that there is proper value for the money expended. We recommend—That the supplemental estimate submitted by the Finance Committee for the expenditure of 27,000*l.* for the alteration and improvement of the Hanwell Asylum be approved."

Mr. Beachcroft said that had the work been carried out by a contractor the additional expense would not have fallen upon the Council.

Mr. Hubbard (Chairman of the Committee) said he did not think a contractor would have undertaken the work under a contract.

Earl Russell said that no contractor would have undertaken to gut the buildings, the character of the construction of which was unknown, and replace them for a lump sum. The work would have been done under a schedule.

The recommendation of the Committee was then agreed to.

Smoke Consumption.—The Public Control Committee reported that a considerable number of complaints had been received during the last few weeks of nuisance from smoke in various parts of the county, but principally from electric-light stations. The Council had no direct control over the smoke nuisance, the duty of enforcing the provisions of the Public Health Act of 1861 resting with the various Sanitary Authorities. The Council had, however, the power of acting in default, and the Council's Inspectors had, therefore, been instructed to report all cases which had come under their notice. They asked the Council to approve of their action.

Sir H. Poland called attention to the nuisance arising from the volumes of smoke emitted by the river steamers. He pointed out that the inability of the owners to obtain smokeless coal was no answer to the requirements of the Smoke Abatement Act. He moved that the report be referred back with instructions to the Committee to draft a further letter dealing with this nuisance. This was seconded by Mr. H. L. W. Lawson, and, on a show of hands, agreed to.

The Water Question.—The Water Committee reported recommending the Council to suspend the standing orders, which provided that no legislative proposals should be submitted to the Council after the summer recess, so that if anything or nothing were done by the Government, the Council would be in a position to submit proposals to Parliament in the next session.

The report was agreed to.

District Surveyor for Fulham.—The report of the Building Act Committee contained the following paragraph:—

"We have considered as to what permanent arrangements it is desirable should be made for the proper supervision of the district of Fulham, rendered vacant by the retirement of Mr. A. Moseley. We may point out that the district is in temporary charge of Mr. S. F. Clarkson, District Surveyor for North Chelsea; and, as he is a district surveyor of some standing, having been appointed in 1886, there appears to be no imperative necessity for haste in making permanent arrangements with regard to the district. Following the usual practice in such cases, we have considered whether any re-arrangement of this district in connexion with those adjoining is desirable; and have come to the conclusion that in the circumstances no such re-arrangement should be made, at any rate at the present time. The district has for many years been the most remunerative of any. The amount of fees received has for the past twenty years averaged 1,750*l.* per annum, and the amount received in 1897 was just over 2,000*l.* It is probable that, as the vacant land becomes occupied by buildings, the amount of fees will decrease; but this will not in the ordinary course be the case for some considerable time, and when it does occur a re-arrangement of districts may be found desirable. On the whole we think that the best arrangement that can be made at the present time is for the district of Fulham to be divided into two parts, and to be designated North Fulham and South Fulham respectively. If this course be adopted, a convenient dividing line appears to be that formed by the Fulham-road and the part of Fulham Palace-road from Fulham-road to Putney Bridge. The estimated amount of the fees, based upon the amount received during the last three months of 1897, for North Fulham is 1,140*l.*, and for South Fulham 805*l.* We think it probable that the amount of the fees, together with the prospect of a re-arrangement of the districts at some future time, will induce gentlemen of some

standing to accept the appointments on the terms laid down by the Council, including the provision that the appointees shall refrain from private practice; or it may be that some of the present district surveyors, in what we may call the poorer districts, may desire to be transferred to one of the two districts of Fulham. We recommend: (a) That the present district of Fulham be divided into two parts, to be designated respectively North Fulham and South Fulham; the former district consisting of that portion of the parish of Fulham situated north of Fulham-road and the part of Fulham Palace-road from Fulham-road to Putney Bridge, and the latter district of the portion of the parish south of those roads. (b) That applications be invited by public advertisement for the appointments, upon the terms laid down by the Council, of District Surveyor for North Fulham and South Fulham respectively; and that all applications for the appointments do stand referred to the Building Act Committee, with instructions to submit to the Council the names of the candidates whom the committee may consider most suitable for appointment as District Surveyors for the respective districts."

Mr. Beachcroft thought it very desirable that the Committee should consider the responsibilities, the duties, and mode of remunerating District Surveyors. Unless he was assured that the Committee proposed to deal with this matter he should move that the recommendations be referred back.

Dr. Longstaff pointed out that a considerable time would expire before a scheme, such as that indicated, could be brought forward. In fact, the matter would not only involve fresh consideration, but an amendment of the Building Act. Assuming that this would mean a delay of twelve months, or even two years, there would be serious administrative inconvenience if this appointment stood over.

Mr. Howell Williams urged the consideration of the question of paying by salaries instead of fees.

Mr. Davis, Chairman of the Committee, remarked that before the office of District Surveyor could be placed upon another basis the Committee would have to bring up a report dealing carefully with the circumstances. No doubt some step in that direction would be taken by the Committee before long.

Mr. Beachcroft did not press the matter further, and the recommendations were adopted.

The Building Disaster at Westminster.—In reply to questions, Mr. Beachcroft said that, whatever the result of the inquiry might be, it would be found necessary to amend the Building Act.

Fire Alarms.—The Chairman authorised the Fire Brigade Committee to make preliminary arrangements for the provision of 130 additional fire alarms in various parts of the county.

The Tramways Question.—The London Tramways Company having expressed in writing their willingness to hand over to the Council the whole of the profits derived from the working of the 2½ miles of tramways which the Council decided last week to work themselves, if necessary, as from July 1, it was decided to accept the offer and to extend the period up to August 10, when the whole of the company's lines fall into the Council's hands.

The Council adjourned, soon after 7 o'clock, until June 21.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

St. George, Hanover-square.—A boundary-wall at St. George's Schools, on the north side of South street and Farm-street (Mr. P. A. Robson for the Board of Managers).—Consent.

Hainpsstead.—An iron and glass porch at the entrance to No. 33, Fitzjohn's-avenue (Mr. L. Solomon for Mr. A. Reittinger).—Consent.

Chelsea.—An oriel window, at the ground floor level, in front of No. 112, Sloane-street (Mr. T. H. Lyons for Mr. C. Sale).—Consent.

Hammersmith.—A conservatory at No. 38, Rylet-road, to abut upon Ashchurch-terrace (Mr. T. Webster for Mr. A. Horstead).—Consent.

Hampstead.—A porch to the entrance of a block of residential flats on the west side of Longland-gardens at the corner of Finchley-road (Messrs. Boehmer & Gibbs for Mr. E. A. Cave).—Consent.

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

Islington, North.—A one-story shop on part of the forecourt of No. 151, Stroud Green-road (Mrs. E. Fitch).—Consent.

Islington, North.—A one-story shop on part of the forecourt of No. 117, Stroud Green-road (Mr. F. L. Pither for Dr. Brighouse).—Consent.

Kensington, South.—That the consent of the Council of May 3, 1898, to the erection of an open portico at the entrance to No. 18, Cromwell-place (Messrs. Langdale, Hallett, & Co. for the Union Bank of London, Limited), be modified by the omission of the words "dedicated to and" in the aforesaid consent.—Agreed.

Lewisham.—A one-story bay window in front of No. 104, West-hill, Sydenham (Messrs. T. Allen & Sons for Mr. W. Woods).—Consent.

Marylebone, East.—A bay window and an oriel window at No. 49, Harley-street, to abut partly upon Harley Mews, North (Mr. F. M. Elgood for Mr. W. H. Warner).—Consent.

Lambeth, North.—A billiard-room in the forecourt of No. 212, Lambeth-road (Mr. G. Brittain for Mr. W. J. Hosking).—Refused.

Bethnal Green, North-East.—An iron and glass illuminated fascia in front of the shops at Nos. 48 and 50, Green-street, Bethnal Green (Mr. J. G. Needham for M. A. Gobatz).—Refused.

Halbarn.—A porch, and bay and oriel windows, in front of a block of proposed buildings on the site of Nos. 33 and 33A, Red Lion-square, and No. 11, Old North-street (Mr. E. J. Stubbs for Messrs. T. Millman & Co.).—Refused.

Islington, East.—A one-story addition in front of the "King's Head" public-house, No. 126, Blackstock-road (Mr. P. Waghorn for the Camden Brewery Company).—Refused.

Kensington, North.—A two-story bay window at No. 6, Dawson-place, to abut upon Chepstow-place (Mr. W. A. Pite for Dr. Basil W. Walker).—Refused.

Kensington, South.—A block of buildings with projecting bay windows, &c., at Hyde Park Gate, on the south side of Kensington-road, to abut also upon Palace Gate (Mr. B. Hosgood).—Refused.

Kensington, South.—An iron and glass covered way at the principal entrance to the De Vere Hotel, Hyde Park Gate (Mr. W. Graves for Mr. J. Crowle).—Refused.

Lewisham.—Houses with shops on the site of Nos. 167 and 169, Stanstead-road, Forest Hill (Mr. A. Stuart for Mr. H. T. Holdon).—Refused.

Lewisham.—Twelve houses, with one-story shops, on the west side of Brockley-road between Beecroft-road and the London, Chatham, and Dover Railway (Messrs. F. & W. Abbiss).—Refused.

Paddington, North.—A one-story shop upon part of the forecourt of No. 2, Fernhead-road, Harrow-road (Mr. S. Barrett for Mr. W. G. Burge).—Refused.

Pekham.—One-story shops upon the forecourts of Nos. 753 and 755, Old Kent-road (Mr. E. Crosse for Messrs. W. Cooper, Limited).—Refused.

Strand.—An enclosed porch in front of No. 1, Cockspur-street, Pall Mall, St. Martin-in-the-Fields (Messrs. Hampton & Sons, Limited).—Refused.

Marylebone, East.—That the resolution of the Council of May 3, 1898, refusing sanction to the erection of a projecting sign in front of No. 16, Great Marlborough-street (Mr. W. D. Caroe for Mr. T. Foakes) be rescinded; and that the solicitor do discontinue the proceedings directed to be taken in the matter.—Agreed.

Width of Way.

Newington, West.—An omnibus shed on the east side of Tarn-street (Mr. R. T. Kingham for the London General Omnibus Company, Limited).—Consent.

Southwark, West.—Twelve houses on the western side of Webber-row, St. George-the-Martyr (Messrs. F. S. Brereton & Son, for the Trustees of Marshall's Charity).—Refused.

Space at Rear.

Southwark, West.—An iron fence on the open space at the rear of No. 166, Waterloo-road (Mr. P. H. Clarke, for Dr. E. Croker).—Consent.

City of London.—That the Council, in the exercise of its powers under Section 41 of the London Building Act, 1894, do not permit the rebuilding of the White Horse public-house, No. 90, Fetter-lane, at the corner of Newchurch-street, with an open space not in accordance with the rules of that Act (Messrs. Cubitt & Collinson for Mr. W. Hyam).—Agreed.

Deptford.—That the Council, in the exercise of its powers under Section 41 (1) (iv.) of the London Building Act, 1894, do not permit the erection of a shop, with a room over, at the rear of No. 2, Amersham-vale, New Cross, without an open space at the rear (Mr. L. Jacob for Mr. C. Leach).—Agreed.

Extension above Diagonal Line.

Chelsea.—That the Council do determine not to sanction the extension, above the diagonal line mentioned in Section 41 of the London Building Act, of a portion of a proposed building—viz., a block of residential flats, to be erected on a site called Nos. 12 and 13, and part of Nos. 11 and 14, D'Oyley-street (Messrs. Bouchier & Galsworthy for Messrs. W. Holt & Sons).—Agreed.

Deviation from Certified Plans.

Whitechapel.—Certain deviations from the plan certified by the District Surveyor, under Section 43

of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "Artillery Tavern," No. 1, Gun-street, Spitalfields (Messrs. Gardiner & Theobald for Mr. W. Rolfe).—Consent.

St. George, Hanover-square.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of a stable, with dwelling rooms and loft over, on the site of Nos. 42 and 43, Duke-street, Grosvenor-square, at the corner of George-yard (Mr. H. Helsdon for Mr. J. Andrews).—Consent.

Formation of Streets.

City of London.—That an order be issued to Messrs. Davis & Emanuel, refusing to sanction the formation or laying out, for carriage traffic, of a new street between Fenchurch-street and Crutched Friars (for Mr. J. Dixon).—Agreed.

Woolwich.—That an order be issued to the Rev. J. McAllister, refusing to sanction the formation or laying out, for carriage traffic, of a new street, 40 ft. wide, between Swingate-lane and King's-highway, Plumstead Common.—Agreed.

Height of Buildings.

City of London.—Erection on the east and west sides of a proposed new street, between Fenchurch-street and Crutched Friars, of buildings to exceed in height the width of such new street (Messrs. Davis & Emanuel for Mr. J. Dixon).—Refused.

City of London.—A building on the south side of Fenchurch-street, at the corner of a proposed new street between Fenchurch-street and Crutched Friars, of greater height than the width of such proposed new street (Mr. T. E. Colclutt for Lloyd's Register of British and Foreign Shipping).—Refused.

Means of Escape at Top of High Buildings.

Strand.—That Messrs. White & Co. be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the sixth floor of a building proposed to be erected on the site of Nos. 34 and 35, Norfolk-street.—Agreed.

Strand.—That Messrs. White & Co. be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is not prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the sixth floor of a building proposed to be erected on the site of Nos. 4 and 5, Norfolk-street.—Agreed.

Buildings for the Supply of Electricity.

Strand.—That the Council do approve of the plans submitted with the application of Mr. C. Stanley Peach for the St. James and Pall Mall Electric Light Company, Limited, for the construction of a chimney shaft addition to the company's generating station and works in Carnaby-street, Regent-street, St. James's.—Agreed.

The recommendations marked * are contrary to the views of the Local Authority.

BOOKS RECEIVED.

FIRE-RESISTING FLOORS USED IN LONDON. By F. R. FARROW. (British Fire Prevention Committee.)

MANUAL TRAINING: WOODWORK. By George RICKS. (Macmillan & Co.)

ELEMENTARY ARCHITECTURE, FOR SCHOOLS, &c. By Martin A. BUCKMASTER. (Clarendon Press.)

OBITUARY.

MR. JOHN STARFORTH.—Mr. John Starforth, architect, died on the 18th inst. The deceased gentleman, who was seventy-five years of age, was born in Durham, and was educated at the University of his native city.

He went to Edinburgh as a youth, and entered the office of Messrs. Burn & Bryce, architects, and served his apprenticeship there. Subsequently he began business on his own account. Among other buildings of importance with which his name is associated as architect are Dumfries and Galloway Royal Infirmary, Greenock Asylum and Poorhouse, Berwick Infirmary, Peebles Hydrographic, John Knox Memorial Institute, Eyre-place Church, London-road Church, Bonnington United Presbyterian Church, Moffat Parish Church, the first Kelso United Presbyterian Church, Nairn Parish Church, Holy Trinity Church, and Galashiels Free Church. In a national competition for the Edinburgh Prince Consort Memorial his design received the first place, but it was afterwards abandoned for the present equestrian statue of the Prince in Charlotte-square. Mr. Starforth also gained the gold medal of the Highland and Agricultural Society for the best design for farm buildings. He was entrusted with the erection of many mansion houses in the Highlands and west of Scotland.—*Scotsman.*

SURVEYORSHIP APPOINTMENT.—On the 17th inst. the Lostwithiel Borough Council elected Mr. Robert W. Reed as their Surveyor and Sanitary Inspector.

GENERAL BUILDING NEWS.

NEW VESTRY, BAKEWELL, DERBYSHIRE.—A new vestry has lately been built at the north side of Bakewell Church. The vestry as now built is from designs by Mr. Naylor, architect, of Derby, and the masonry and building work has been carried out by Mr. T. Allsop, builder, of Bakewell. The building is of Stanton stone. The interior is 25 ft. 9 in. from east to west, and 17 ft. 6 in. from north to south, and there is a movable screen to divide the parts to be used by the clergy and the choir.

NEW CHANCEL, MAGHERAGALL PARISH CHURCH, LISBURN, IRELAND.—The consecration of the new chancel of this church took place recently. The seating accommodation has been increased by about sixty. A new vestry has been provided and a window inserted in the north wall, against which the former vestry stood. The new east window, which is in three lights, has been filled with stained glass, from the design of the architect, Mr. G. L. W. Blount, of Belfast. The contract was carried out by Mr. Walter Law, builder, Moira.

RESTORATION OF TOWER OF OWSTON CHURCH.—On the 13th inst. the Church at Owston, near Doncaster, was re-opened after the restoration of the Norman tower. The architect was the late Mr. J. Loughborough Pearson, R.A., of London, and on his death the work was continued by his son, Mr. Frank Pearson. The builder was Mr. George Fisher, of Carcroft, and the clerk of the works, Mr. Bond, of Lincoln. The restoration consisted of taking down the top portion of the tower and all the west wall, with the exception of about 20 ft., and rebuilding it stone by stone, the old stones being replaced in their original positions. The whole of the Norman tower is built against the west side of the old Saxon nave.

NEW ESTABLISHED CHURCH FOR DUNDEE.—The committee appointed by the Kirk Session of the parish of Mains and Strathmartine have now received plans of the proposed new church in Chepington-road, prepared by Mr. Alexander Johnston, architect. These show a church with a nave fronting Chepington-road and the corner of Neishfield-street, and an aisle to the west separated from the nave by stone columns and arches, and having two double transepts and a choir. It is proposed to at once proceed with the erection of the nave and aisle to seat about 500. The plan also shows a vestry and hall, and as the congregation develops the transepts, choir, and other buildings will be added.

NEW CHAPEL, ALL SAINTS' CHURCH, CHELTENHAM.—The new chapel which has been recently erected on the south side of the sanctuary of All Saints' Church, Cheltenham, has just been dedicated. The addition is from a design by Mr. H. A. Prothero (Messrs. Middleton, Frothero, & Phillott). Messrs. Hart executed the carved work, and the builders were Messrs. Billings. Stained-glass windows have been promised from designs by Sir Wm. Richmond.

RE-OPENING OF MATLOCK PARISH CHURCH.—On the 10th inst. Matlock Parish Church was re-opened after extension and improvements. The work executed comprises new south aisle and transept, enlargement of the organ, decoration and paving of the chancel. The accommodation is increased by about 130. The cost is about 1,500l. The work was entrusted to Mr. E. H. Currey, of Derby, the masonry to Mr. W. Boden, Matlock, the joinery to Mr. W. Holmes, Matlock Bath, and the plumbing to Mr. A. R. Keeling. The stone is supplied from the Tansley Moor quarries. The church has just been opened. The hall, which is situated at the entrance to Mere-street, is about 56 ft. in length and 25 ft. in breadth, with open-timbered roof, and a floor laid with wood upon concrete. Adjoining it are a committee-room and various offices. Mr. Arthur J. Lacey, Diocesan Architect, designed the building, which has been erected by Mr. Ludkin, of Banham.

CHURCH EXTENSION, IPSWICH.—Steps are being taken to carry out the scheme of building a new church for the parish of St. John's, Ipswich. Plans have been prepared by Sir Arthur Blomfield & Sons for a new church, holding 800 people, and the tender of Messrs. Cornish & Gaymer, of North Walsham, has been accepted. This amounts altogether to 17,190l.

CONGREGATIONAL CHURCH, POULTON-LE-FYLDE, LANCAIRE.—The foundation stone of a new Congregational Church has just been laid at Poulton-le-Fylde. The church is being erected from the designs of Mr. Andrew, architect, Preston, at a cost of 2,500l.

METHODIST CHURCH, MORRISTON, GLAMORGANSHIRE.—Eleven methodist stones have just been laid of the new Nazareth Calvinistic Methodist Church, Morriston. The contractors are Messrs Thomas & Jones, Morriston, and the architect is Mr. William Williams, Swansea. The cost of the church is estimated at 1,600l.

FREE CHURCH, PLUSCARDEN, N.B.—The foundation stone has just been laid of the Free Church of the new Nazareth Calvinistic Methodist Church, Morriston. The contractors are Messrs Thomas & Jones, Morriston, and the architect is Mr. William Williams, Swansea. The cost of the church is estimated at 1,600l.

WESLEYAN CHURCH, BARNACK, NORTHAMPTON.—The foundation stones have just been laid of

new Wesleyan Church for Barnack. Messrs. Hinson, of Stamford, were entrusted with the contract for the building. Plans of the building have been prepared by Mr. Wm. Hinson.

CONGREGATIONAL CHURCH, UPNOR, KENT.—A new Congregational Church and Institute are being erected in High-street, Upnor. The architect is Mr. G. E. Bond, of Rochester, and the contractor is Mr. A. Turner.

WESLEYAN CHURCH, BLACKWOOD, MONMOUTHSHIRE.—The memorial stones of a new Wesleyan Church at Blackwood have just been laid. The architects of the building are Messrs. Rosser & Roberts, of Abercarn.

PRIMITIVE METHODIST CHURCH AND SCHOOLS, BOLSOVER, DERBYSHIRE.—The Primitive Methodists of Bolsover are erecting a new church and school-rooms at the Town End. The edifice consists of a church to seat about 300, and schoolroom, 45 ft. by 26 ft., with five class-rooms adjoining, 14 ft. by 11 ft. each. The interior woodwork will be of pitch-pine, and the roofs of the church will be open, with pitch-pine timbers. The exterior is to be of pressed bricks, with stone dressings. Mr. W. J. Morley, of Bradford and Harrogate, is the architect. The plans for building have been prepared with Mr. Oakley, of Bolsover (brick and slating); Messrs. Wilson, of Castleford (joiners' work); Messrs. Ays & Houghton, of Mansfield (plumbers' work); and Messrs. Harland & Sons, Bradford (painting).

NEW U.P. CHURCH, GARDENSTOWN, BANFFSHIRE.—Estimates are being invited for the erection of a new U.P. Church at Gardenstown. The church is seated for 400. Owing to the fall in the ground towards the west, it has been possible to provide a hall capable of seating about 140 under the western end of the church with but slight excavation. The dimensions of the church, without projections, are 43 ft. by 23 ft. to west, and 37 ft. from north to south. Mr. R. G. Wilson, Aberdeen, is the architect for the new building.

WESLEYAN CHURCH, ELMSWELL, SUFFOLK.—The foundation stones of a new Wesleyan church have been laid at Elmswell. The new building will be about 43 ft. long and 23 ft. wide. Behind the platform of the church there will be a movable partition, which will be used to form a schoolroom at the far end of the building. The structure will be of red brick, with white dressings. Messrs. Eade & Johns, of Ipswich, are the architects. The builders are Messrs. Hogg & Son, of Coney Weston, near Ipswich.

WESLEYAN CHURCH, WALTHAMSTOW.—The new Wesleyan Church on Church Hill, Walthamstow, has now been completed. The total cost, including the site, has been about 5,700l. The architects were Messrs. Gordon, Lowther & Gunton, of London. The building consists of nave, transepts, chancel, organ chamber, and three vestries, the seating accommodation being for 600. It is built in red brick, with stone dressings. Schools have been erected alongside the church to accommodate 450 children.

PARISH CHURCH, HUTCHESONTOWN, GLASGOW.—The plans for this new church passed the Dean of Guild Court last month. The new church will be situated at the north-west corner of Rose-street and Rutherglen-road. The church is seated for 950, with a hall to accommodate 600 persons. The buildings include church, organ chamber, halls, vestry, session-house, library and committee rooms, kitchen, lavatories, &c. The estimated cost is about 144 persons. The architect is Mr. Alex. Adams, Glasgow.

PRIMITIVE METHODIST CHURCH, BURSTWICK, NEAR HULL.—On the 12th inst. the stone-laying ceremony of the new Primitive Methodist Church at Burstwick took place. The plans were prepared by Mr. T. B. Thompson, of Hull, to provide a church to seat 144 persons. The school-room, which is divided by a movable screen, will seat about 200, and the class-room about 30. The total cost of the church, inclusive, will be about 1,000l.

EXTENSION OF METHODIST CHURCH, SHEFFIELD.—Additions have just been made at John-street Church, Sheffield. The new accommodation consists of an infants' school-room with gallery, four other class-rooms of good size, and two large assembly-rooms, of which one will be for the Young Men's Institute and the other for the Young Women's Institute. A new staircase has been provided which connects the various rooms, also a large kitchen, and boiler room; and the upper part of the church has been extended, and the organ reconstructed in a new, so as to give more space for the choir. All the premises have been modernised by the introduction of electric lighting, the power being supplied by the Sheffield Electric Light and Power Company. The contract for the work of extension was let to Mr. John Morton. The architect was Mr. C. J. Innocent.

NEW WESLEYAN CHURCH, ATTERCLIFFE, SHEFFIELD.—A school-chapel in Staniforth-road, Attercliffe, has just been opened for the Wesleyans. The school-chapel will accommodate 220 persons. Mr. William Aspley, Handsworth, was the contractor. The architects being Messrs. James & John Hardcastle, Woodhouse.

METHODIST EXTENSION, HORNSEY.—The memorial stones of church extension and new school have been laid at the Middle-lane Wesleyan Church, Hornsey. Plans have been prepared by Mr. W. H. Cony for a suite of buildings comprising a church

parlour, five class-rooms, infant school, and a lecture-hall, as well as the addition of 300 sittings in the church. The cost will be about 4,500l., and the contractor is Mr. F. D. Stead, of Holloway.

NEW SCHOOLS, ST. COLUMBA'S COLLEGE, DUBLIN.—Some months ago a fire broke out in this College, and destroyed some of the buildings. These have just been rebuilt and opened. The present structure is 100 ft. long by about 40 ft. wide; facing the east and north is the school-room. To the west and south is the boys' library and reading-room, and over the library is a large dormitory. The whole structure, which is of granite, has been erected at a cost of about 4,000l. Mr. Richard Caulfield Owen was the architect, and the contract was entrusted to Mr. Henry Sharpe.

TECHNICAL SCHOOL, BATLEY.—The opening of a new wing added to the Batley and District Technical School, to perpetuate the memory of the late Mr. James Stubley, took place a few days ago. The building, which has been erected from plans prepared by Mr. H. B. Buckley, of Batley and Leeds, is of stone, and is uniform with the remainder of the Cambridge-street structure.

BAPTIST CHURCH, HUNGATE, LEICESTERSHIRE.—The memorial stone has just been laid of a new Baptist School at Hungate. A new wing, purchased adjoining the chapel, and the preparation of plans was placed in the hands of Mr. F. Clarke, architect, of Leicester.

SCIENCE AND ART SCHOOLS, STOKES, STAFFORDSHIRE.—It has been decided to provide further and better accommodation in respect of science subjects at the Stoke Schools of Science and Art. It is intended to erect new buildings for science purposes over the ladies' baths when the latter have been renovated. These will comprise rooms on the first floor for woodwork and pottery classes, and in the second floor a chemical laboratory will be established and maker's and lecturer's rooms provided. The architects in the matter are Messrs. Beckett & Lynam.

NEW SCHOOL, ANDROSSAN.—Plans for the proposed new school to the south of the Castle Hill having been prepared by Mr. John Armour, jun., architect, Irvine, tenders were invited and received. The accepted estimates amount to about 45,240l.

SUNDAY SCHOOL EXTENSION, HUCKNALL, LIVERPOOL.—On the 16th inst., three memorial stones were laid of a building in course of erection for the accommodation of Sunday scholars at Bethesda Chapel (Methodist New Connection). Plans were drawn by Messrs. Howitt & Mollat, providing room for 350 scholars, and the contract has been let to Mr. J. Whitty.

BOARD SCHOOL, SEACOMBE, CHESHIRE.—The erection of the new public elementary schools for the Poulton-cum-Seacombe School Board has now been commenced by the contractor, Mr. E. Gabbutt, of Liverpool. The buildings comprise a four-department school, and will accommodate 1,231 children. The erection is being proceeded with under the personal supervision of the architects, Messrs. T. Mellard Read & Son, of Liverpool.

NEW BOARD SCHOOL, WOLVERCOTE, OXFORDSHIRE.—A new Board School has just been opened at Wolvercote. Besides the school buildings the scheme also includes the provision of a residence for the master and mistress, and this has been erected on the north side of the school, the total cost of the whole being about 2,000l. The building is of red brick and Bath stone dressings, and roofed with Broseley tiles. Mr. C. C. Robinson is the builder, and Mr. G. Castle the architect.

ENLARGEMENT OF THE SCHOOLS, WEEDON, NORTHAMPTON.—The enlargement of these schools, which has been contemplated for some time, will take place during the Midsummer holidays. Messrs. Roberts' tender has been accepted. Messrs. Law & Harris are the architects.

NEW WING, SALISBURY SCHOOL.—A new wing has just been opened at Salisbury School. The additions which have been made comprise the building of entrances for the boys, and corridors communicating with the old part of the premises, four additional class-rooms, each about 22 ft. by 18 ft., library and lavatory on the ground floor; the great hall, 56 ft. by 22 ft., and another classroom. The dining-room has been extended 23 ft. 6 in. on the first floor, above which are two floors of dormitories. A short staircase gives access from the ground floor to the rooms on the first floor. All the rooms and corridors, as well as those in the old part of the house, are now heated independently of the open fireplaces by hot-water pipes and radiators from a furnace in the basement, near which a boys' changing room has been provided with long rows of pipes upon which to dry damp clothes. The work has been carried out by Messrs. Wort & Way, and the heating by Mr. Jno. Carter, the architects being Messrs. Harding & Son.

COTTAGE HOSPITAL, WOODFORD, ESSEX.—It is proposed to erect a cottage hospital at Woodford. The site selected occupies a corner position in Broomfield Walk, facing the Green. The plans provide on the ground floor a male and a female ward with a nurse's room between. Each ward will contain three beds, but the accommodation is sufficient for six beds each. In the female ward will be placed the children's cots. An entrance porch leads to a central hall, with waiting-room adjoining, and close by is the operating-room. Opposite to the operating-room is the matron's bed-room and sitting-

room. The kitchen and domestic offices are placed at the rear. Beneath the kitchen are the coals and wood store, together with a heating chamber. The first floor provides for one male and one female paying patient, servants' bed-room (two beds), nurses' bedroom, bath-room, &c., and store-rooms. It is proposed to carry out the elevations in red brick with stone dressings and roofed with Broseley tiles. The architects are Messrs. T. Kingwell Cole and Kenneth Wood.

COTTAGE HOSPITAL, ASHBY, LEICESTERSHIRE.—A new cottage hospital has been erected at Ashby, as a memorial of Queen Victoria's record reign. The building has been erected on the north-east corner of the old cricket field, Leicester-road, and occupies a site of nearly a quarter of an acre. In front is a verandah with glass roof on iron girders and skylight bars; opening out of this is the main door leading into an entrance lobby and hall, with staircases for the upper floor. Right and left of the lobby are doors opening into the matron's room on one side, and the nurses' room on the other. At each end of the hall are the doors opening into the female ward, and on the left into the male ward. Adjoining these are the lavatories, disconnected from the wards by cross-ventilated lobbies. The wards are constructed for four beds each, with a cubic capacity of 1,200 cu. ft. of air space for each patient, with an occasional addition of an extra bed or child's cot. Returning to the hall, on the left-hand side is the surgeon's and operation room, and on the right a bathroom and stores; from the hall a central passage leads to the back entrance, with a kitchen and pantry on the right, and scullery on the left. A mortuary has been built on the extreme boundary on the eastern side of the premises. The central block is carried up two stories, and contains three bedrooms for the staff, and occasionally one can be used for a separation ward. The front and back of the building are faced with Whitcomb hand-dressed bricks, with stone dressings, and the roof covered with Broseley tiles. The plans and specifications of the hospital were prepared by Mr. G. H. Lilley, Town Surveyor of Ashby, and the contract let to Messrs. W. M. Slater & Son, also of Ashby.

PROPOSED EXTENSION OF ABERDEEN CITY HOSPITAL.—The City Hospital Committee of the Aberdeen Town Council met at the Hospital on the 17th inst. The Committee had under consideration the proposed extension of the administrative block at the hospital. Mr. Rust, City Architect, submitted amended plans showing accommodation for nurses and servants on the main block, and also showing the extension of the north wing of the present reception block. The total cost of the extensions is estimated at 4,650l. The Committee generally approved of the plans.

ADDITIONS TO LOWESTOFT HOSPITAL.—On the 17th inst. the new children's wing at Lowestoft Hospital was opened. The new wing has been designed in character with the existing building, and is connected therewith by a covered way paved with tiles. The large ward is arranged for six cots. The floor is laid with polished maple blocks, and the walls finished with Parian cement. The ward is heated by means of Sheridan's central ventilating stove and is lighted by incandescent burners. There is also a smaller ward for two beds, with a separate entrance, so that, if occasion requires, it may be used as an isolation ward. There are separate lavatories and bathrooms to the wards, and between them is a nurses' duty room. The building was designed and erected under the personal supervision of Mr. W. J. Roberts, architect, of Lowestoft, and the builder is Mr. Bedwell, of Lowestoft and Carlton Colville.

NURSES' HOME, WANDSWORTH.—The Nurses' Home for the Guardians of Wandsworth and Clapham Union, to accommodate upwards of seventy nurses, and for which a competition was held last year, is about to be erected at the Infirmary, St. John's Hill, from the designs of Messrs. Lansdell & Harrison.

EPILEPTIC HOMES, CHALFONT ST. PETER.—A home for men, the Victoria House, has just been opened at Chalfont St. Peter, Buckinghamshire, and the foundation stones have been laid of two new homes, one for boys and the other for girls. All three buildings are designed by Mr. Maurice B. Adams. The builder of the Victoria House is Mr. George Darlington, of Amersham. Messrs. Ruskin & Sons, of St. Albans, will erect the two children's homes.

WORKHOUSE, NOTTINGHAM.—Messrs. Hodson & Son, of Nottingham, have been appointed contractors for the foundations of this building. The total accommodation in the entire building represents provision for 1,614, exclusive of members of the staff. Messrs. Marshall & Turner are the architects, their plans being selected in competition.

STIPENDIARY MAGISTRATE'S NEW OFFICES, BURSLEM, STAFFORDSHIRE.—New offices for the Staffordshire Potteries Stipendiary Justice Commission have been erected in the Moorland-road, Burslem. They have been built from the plans of the late Mr. E. Penn, at a cost of 1,000l., exclusive of land and fittings, the contractor being Mr. J. J. Loughton.

INSTITUTE, CATRINE, AYRSHIRE.—The memorial stone of the A. M. Brown Institute, Catrine, has just been laid. The institute has been given to the village, in commemoration of the Diamond Jubilee,

by Mr. A. M. Brown. It is being built of Ballochmyle red stone, and has been designed by Mr. R. S. Ingram, architect, Kilmarnock, in the Scottish Baronial style, with a clock tower as its main external feature. The accommodation provided will consist of a general reading-room, ladies' reading-room, billiard-room, gymnasium, and games-room, in addition to which there will be baths for both sexes and a janitor's house.

NEW ALMSHOUSES, ROTHERHAM.—Four almshouses have just been built on a site located off the Broom-road, Rotherham. Mr. J. E. Knight, of Rotherham, has been the architect, and Mr. S. L. Pilgrim, of Rotherham, the contractor.

ORPHAN HOME, &c., HULL.—On the 12th inst. an infants' home and a sanatorium were opened at Hull. The infants' home provides accommodation for twenty-eight children under the age of seven years, and contains on the ground floor an entrance hall and staircase, playroom, dining-room, cloak-room, and separate lavatory arrangements for boys and girls, a sitting-room for the matron, kitchen, scullery, and the necessary store. On the first floor are two large dormitories, with bathroom, lavatories, and housemaid's sink, also the matron's bedroom and two bedrooms for the servants. The hospital provides in the main building accommodation for six boys and six girls in separate wards, sitting-room and bedroom for the matron, bathroom, kitchen, stores, &c. The whole of the walls are finished internally with Parian cement, and the floors of the wards are of maple. In the rear of the hospital and connected therewith by a covered way is a small ward for the isolation of doubtful cases, and to which is attached a nurse's bedroom and the usual offices and a washhouse. Messrs. Darneley & Son were the contractors for the whole of the work, excepting mason's work, which has been executed by Mr. J. W. Buttery, of Cottingham. Mr. Thomas Bayes has acted as clerk of works, and the buildings have been carried out from the plans and under the direction of Mr. W. H. Bingley, architect, Hull.

BANK AND SHOPS, DEWSBURY.—A bank, with offices, is to be erected from plans by Mr. John Lane Fox, architect, Dewsbury, in Northgate and New Bridge-street. From the eastern end of the bank Messrs. Holton & Fox, of Dewsbury, architects, are about to erect buildings—shops, with offices over—which will extend to Foundry-street. Messrs. John Kirk & Sons, architects, Dewsbury, have prepared plans (now before the Building Committee of the Corporation), for an arcade, which is to extend from the Market-place to New Bridge-street. In the same neighbourhood, viz., at the junction of Foundry-street South with New Bridge-street, Mr. Gutteridge is erecting a shop, with workrooms above, from designs by Messrs. D. & W. Thornton architects, Dewsbury, who are engaged in superintending the construction of a warehouse in Crickenedge-lane.

FIRE BRIGADE STATION, BRIGHOUSE, YORKSHIRE.—It is proposed to erect a new fire station at Owlter Ings, Brighouse, from the designs of Messrs. Sharp & Waller.

NEW FREE LIBRARY, STALYBRIDGE.—At a special meeting of the Libraries Committee of the Stalybridge Corporation, recently, Mr. J. Frederick Cheetham, donor of the new free library (the foundation stone of which was laid last autumn), announced that he had that day signed a contract for the erection of the building, and work would be commenced immediately. Mr. James Medland Taylor, of Manchester, is the architect.

JUBILEE PARISH-ROOM, GULWORTHY.—A parish-room has just been opened at Gulworthy as a memento of the Diamond Jubilee of the Queen's reign. The building, 40 ft. by 20 ft., with porch and boiler-room attached, has been erected by Messrs. J. Webb & J. Collocott, under the superintendence of the architect, Mr. J. Roskilly.

GRAND HOTEL, BROADSTAIRS.—The Gordon Hotels Company recently acquired the Grand Hotel at Broadstairs, which is now being improved and enlarged. Mr. T. W. Cutler is the architect. The renovated and enlarged building will consist of five stories.

BUSINESS PREMISES, SWANSEA.—Messrs. Watson Bros., Brynmor-road, have just opened new premises. The architects were Messrs. Margrave & Pencock, Swansea, and the builder, Mr. John Davies.

CHILDREN'S CONVALESCENT HOME, FOR LEICESTERSHIRE.—Two houses were taken at Woodhouse Eaves at the close of last year, which have been fitted up for use as a convalescent home for children. The houses have been connected by a corridor of two floors, the lower forming a porch and the upper a passage of communication. On the ground floor there is a large day-room for the children, a play-room for the matron, and the kitchen offices; on the upper floor there is sleeping accommodation for twelve children in the one house, which will be increased to about thirty when the second house is furnished. Mr. G. H. Barrowcliffe, Loughborough, has been the architect for these alterations.

CENTRAL FIRE STATION, EDINBURGH.—A new Central Fire Station is being erected on part of the Cattle Market site at Lauriston, and in Lady Lawson's-street, Edinburgh. The estimated cost of building and site is £33,000, and the plans have been prepared by the City Architect.

TOWN HALL, EASTLEIGH.—Mr. Robert H. Bichnell, C.E. (Inspector for the Local Government Board) sat at the offices of the Eastleigh District Council recently to inquire into an application made

by them for sanction to borrow 5,000l. for the provision of public offices, fire station, stables, and cart shed. There were present Mr. J. Stringfellow (Surveyor) and Mr. Gutteridge (of the firm of Mitchell, Son, & Gutteridge, architects, of Southampton, who are acting as architects for the proposed building), and others.

HOLIDAY HOME, CLACTON.—The Right Hon. Sir Henry Fowler, M.P., laid the foundation stone a few days ago of a Children's Holiday Home at Clacton-on-Sea. Mr. Charles Bell is the architect, and Messrs. J. S. Hammond & Son are the builders.

LAUNDRY, HOLLOWAY.—A new laundry has just been opened in Thane-villas, Seven Sisters-road. The architect of the new building is Mr. Richard Midworth, of Finsbury Park.

PUBLIC-HOUSE, OLD KENT-ROAD.—The foundation-stone of the new "Thomas à Beckett" public-house has just been laid. The new building is being erected on the site of the old premises. It is to be in the Renaissance style. The architect is Mr. Richard Wilcock, and the builders, Messrs. Patman & Fotheringham.

TURKISH BATHS, NOTTINGHAM.—New Turkish baths have just been erected in Upper Parliament-street, Nottingham. The building is divided into two wings, for ladies and gentlemen, each wing being approached by a separate staircase. Boot-rooms are passed through before the unrobing chambers are entered, and the latter are partitioned into several compartments. The scheme of decoration, as well as the style of the building, is Moorish. The floors throughout are fireproof, and in the hot rooms and cooling-rooms are of vitreous glass mosaic. In the shampooing-rooms there are marble slabs, needle baths, showers, douches, and Russian steam baths. Large plunge baths are provided in the building. At the top of the building is a steam laundry. The basement contains the boiler and engine-room. Messrs. Brewell & Baily, of Nottingham, are the architects, while the fittings have been furnished by Messrs. Bendford & Co., Manchester.

NEW HYDROPATHIC ESTABLISHMENT, NEAR ABERDEEN.—Contracts have been entered into for the erection at Furtle, near Aberdeen, of a new hydropathic establishment. The building will be of granite, and the total cost is estimated at 12,000l. Mr. R. G. Wilson, Aberdeen, is architect, and the contractors are—Messrs. John Morgan; carpenter work, Leslie & Hay; plasterer, Geo. Leith; painter, E. Copland; plumber, A. B. Robertson—all of Aberdeen; and slater work, A. Kinkaid, Cults, near Aberdeen.

CATHOLIC SCHOOLS, KENDAL.—The foundation stones of the new Dean Gibson Roman Catholic Memorial Schools have just been laid at Kendal. The site of the new schools is in Gillington, and at the rear of St. Paul's Convent, Blue-cook. The schools are being built of local stone, with Fudham freestone dressings, and the roofs will be covered with Buttermere slates. On the ground floor is a mixed schoolroom, 88 ft. by 30 ft.; infants' room, 54 ft. and 24 ft.; three class-rooms; three separate entrances for boys, girls, and infants; with cloak-rooms and lavatories. In the basement are cookery and laundry class-rooms and the boys' covered playground; at the rear there are open and covered playgrounds and a workshop for manual instruction. The schools will be heated with hot water. All the rooms in the schools are being lined for a height of 4½ ft. with glazed brick. Mr. John Stalker, Kendal, is the architect. The following are the contractors for the various works: Mr. J. W. Howie, mason and slater; Messrs. Nelson Brothers, carpenters and joiners; Mr. L. Airey, plumber; Mr. W. Jackson, painter and glazier; Mr. B. Davis, plasterer; and Mr. J. Kennedy, smith, all of Kendal; Messrs. Gill & Co., Lancaster, ventilating engineers; Messrs. Dilworth & Carr, heating engineers, Preston.

SANITARY AND ENGINEERING NEWS.

DRAINAGE SCHEME, POKESDOWN, HANTS.—The ceremony of turning the first sod in connexion with the scheme adopted by the Pokesdown Urban District Council for the drainage of the district has just taken place. The tender of Messrs. B. Cooke & Co. for the works in the sea, at 3,708l., and that of Messrs. W. H. Saunders & Co. for the sewers, at 13,472l., have been accepted. The surveyor is Mr. E. W. Ingamells.

THE SEWAGE DIFFICULTY, SALFORD.—At the Salford County Court, on Monday, the Salford Corporation were summoned for non-compliance with an order made in 1895 in respect of pollution of the river Irwell and the Manchester Ship Canal. The proceedings were instituted by the Mersey and Irwell Joint Committee. The matter was before the court last July. The judge inflicted a fine of 100l., and threatened that unless better progress was made with the Corporation's scheme he would have to impose the maximum penalty of 500l. a day.

NEW PETERBOROUGH BRICK COMPANY.—The directors of the New Peterborough Brick Company, Limited, have voted to Mr. F. H. Cooke, on his retirement from the post of secretary and surveyor to the company, a honorarium equivalent to six months' salary, in addition to which the ordinary shareholders have presented him with a cheque for 250l., as an acknowledgment of his services to the company.

FOREIGN.

FRANCE.—M. Victor Prouvé has been commissioned by the Conseil Municipal de Paris, to decorate the Salle des fêtes of the XIth arrondissement. The same artist is also to do some artistic relief in leather mosaic for the Musée Galliera. On June 2, the monument in memory of Eugène Flachat, engineer, in the Boulevard Pereire, is to be inaugurated. Amongst other works, the Ceinture Railway is due to him. The monument is the work of Mm. Alfred Boucher, sculptor, and Gaston Trélat, architect. Nothing has yet been decided on the subject of the Palace in which the Government intend to receive the foreign Princes at the 1900 exhibition. The State thinks of the magnificent Hotel of Comte Pototski in the Avenue Friedland, as being suitable. On the other hand it is stated that the Emperor of Russia intends purchasing the château de Bagatelle in the Bois de Boulogne, as his private residence. It was for some time the residence of Sir Richard Wallace. The State has just purchased the bust of Alexandre Dumas fils. It is by Moncel, the sculptor, and has been exhibited this year. It will be placed at the Institute. On Sunday last a monument was inaugurated to the memory of Auguste Hardy, founder of the National Horticultural College. The monument, which is in Lorraine stone with bronze reliefs, is crowned by a bust of the great horticulturist. It is the work of M. Marcel Lambert, architect, assisted by the sculptors Coutan, Cougny and Guilleux. Mme. Meissonier, widow of the celebrated artist, has just died at Poissy. She has left a considerable number of her husband's works to the State. The death is announced, at the age of 28, of Maurice Heyman, artist, and of M. Louis Bennet, aged 65. The latter was Superintending Architect of Public Works. We have also heard of the death of M. Louis Bachelard, at the age of 79. He was an engraver of great talent, a pupil of his father, who was also a distinguished engraver. He gained the second prix de Rome in 1838, and medals at the Salons of 1843, 1847, 1857, 1867, and at the Exhibitions of 1878 and 1889; in 1861 he received the Cross of the Legion of Honour, and was elected member of the Institute in 1888. We may mention, among his principal works, "The Derby Day," after Frith's picture; the "Chess Players," after Meissonier; and the "Marriage of the Princess Royal and Prince Frederick of Prussia," after John Philip, which is in the Chapel Royal, St. James.

AUSTRIA.—The committee for the erection of a second Czech theatre in Prague have approached the Council, asking for a site for their undertaking. A portion of the city park, between the Mariengasse and the Bolzano-gasse, has been set aside for the purpose. For the new slaughter-house and horse-market in Brunn, the Town Council have decided to purchase several plots of land at a total cost of 60,000 florins. The slaughter-house will cost over a million gulden. A new high school is to be erected in Buda-Pesth, in the Áttilagasse. It will be three stories in height, and will contain all modern improvements. It is to be erected next year. Twelve studios for artists and sculptors are to be erected in the Kmettygasse, Buda-Pesth, at a cost of 70,000 florins. An orphanage for 150 girls is to be erected at Buda-Pesth, to cost 300,000 florins. Three new schools (one of them a technical school) are about to be built in Szeged. A new cavalry barracks is to be built in Debreczin; the Bolzano-gasse, has been set aside for the purpose. A new church for the Roman Catholic community at Detta is to be erected; the estimated cost will be 81,550 florins. The plans for the new buildings for the Poor-Law Guardians of Leopoldstadt, Buda-Pesth, have been submitted for approval to the magistrate. As soon as the plans are passed the works will be proceeded with. The estimated cost is 180,000 florins. It is intended that the buildings shall be roofed in this year and opened in 1899. A loan of 927,250 florins is to be raised at Pilsen for the construction of an electric tramway. The steam engines are to be constructed by Herr E. Skoda, engine builder, of Pilsen, at a cost of 80,464 florins; the electric machinery, dynamos, accumulators, &c., by Herr F. Krjizik of Prague for 339,200 florins.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Lansdell & Harrison, architects, have removed their offices from Compton-terrace, High-bury, to 38, Bow-lane, Chesham, E.C.—Mr. C. H. Strange, architect, has removed from 67, Oaklands-road, Cricklewood, to 43, Grosvenor-road, Turn-bridge Wells.

CHRIST CHURCH SITE, BIRMINGHAM.—The Colmore trustees, who purchased the Christ Church site, have not decided, it is stated, upon any use to which the site is to be put. But a sketch plan, says the *Birmingham Gazette*, has been prepared by Messrs. Henman & Cooper, architects, for a block of commercial buildings, the central feature of which is an exchange hall, with a tower, looking towards Paradise-street. The difficulties incidental to the site have been overcome in the architects' design by placing the Exchange Hall on the level of Waterloo-street, and so obtaining a lower ground level for shops facing and in the level of New-street, and by the formation of an arcade on the remaining

three sides, by which no fewer than thirty shops in all are secured. In addition to this, the upper stages of the building are generally set back some 12 ft. from the frontage lines, which will improve the lighting all round, and provide a horizontal base for the building above. The Colmore trustees, as indicated, have not yet had any scheme submitted for their consideration, but it is probable that matters will take some definite shape within the next few weeks.

THE DUKE OF CLARENCE MEMORIAL, WINDSOR CASTLE.—The monument which has been erected by the Prince and Princess of Wales to the memory of the Duke of Clarence and Avondale, in the Albert Chapel, at Windsor Castle, was designed and executed by Mr. Alfred Gilbert, R.A.

THE BURNS STATUE FOR LEITH.—Mr. D. W. Stevenson, R.S.A., has just modelled in the clay the colossal statue of Burns for Leith. A site has not yet been fixed for it, though the foot of the Walk on the spot where the weigh-house stands, is favoured by the subscribers; but it seems there is a difficulty in removing the weigh-house from this central locality, and the statue may have to go elsewhere. The figure is 9 ft. in height, and will stand on a pedestal 10 ft. high. The statue is to be cast in bronze.

BUILDING TRADERS AND THE COMPENSATION ACT.—A preliminary meeting of employers, chiefly those engaged in the building trade, was held recently at the Mechanics Institute, Darlington, on the initiative of Mr. Geo. Marshall, ex-Mayor, to consider the formation of a mutual assurance company for the benefit of the employers under the new Employers' Liability Act. In the course of some discussion the idea of forming a mutual assurance company rather than insuring with outside companies was received with favour. It was suggested that a company to include Durham and parts of Northumberland and Yorkshire could be established under limited liability with a nominal capital of from 10,000, to 20,000. A committee was appointed to obtain information and report to an adjourned meeting.

STATUE OF THE QUEEN, SOUTHERN.—Alderman Tollhurst, who was Mayor last year of Southend-on-Sea, has presented to the town a marble statue of the Queen in commemoration of her Majesty's Diamond Jubilee. The sculptor is Mr. J. M. Swynnerton.

GREYFRIARS CHURCH, ABERDEEN.—A special meeting was held on the 17th inst., at the Aberdeen University Court, to consider the new phase of the Marischal College Extension Scheme—the proposal to retain Greyfriars as a church, coupled with the proposal to erect a front wing, facing Broad-street, on the site that would have been occupied by the new Greyfriars Church. A good deal of conversation took place over the new proposal, the members generally being very favourably disposed towards the scheme as a whole. It was felt, however, that before coming to a definite finding on the subject, the Court should be in possession of more detailed data as to the cost in particular of the scheme. In the end the following resolution was put to the meeting from the chair, and adopted unanimously:—“That the Court, in committee, having considered the terms of the reply of the Town Council on the subject of the retention of Greyfriars Church, remits to the Sites and Plans Committee to obtain a plan, with estimates of cost, of such scheme of extension as would be required to provide the accommodation still needed for the efficient working of the school as a whole. It was felt, however, that the Town Council being agreed to; and to report to a further meeting of the Court in committee.” In order to show effectively the bearing of the new proposals in connexion with the Extension Scheme, instructions have been given for the alteration of the model of the extended college buildings.—*Aberdeen Free Press.*

THE SLATE TRADE.—Loading continues brisk at the quarries. Negotiations are being carried on for insuring against the Workmen's Compensation Act, the rates quoted averaging from about 20s. upwards, according to the safety of the quarry. The output of the Nant Valley will be increased by the working of Tyddyn Agnes and adjoining quarries. Hitherto these properties, being in the hands of different owners, have never been properly worked, but, having been acquired by a strong company not over-capitalised, should return very good profits, the veins being of fine quality and ample width.

THE BUILDING DISASTER AT WESTMINSTER.—In the House of Commons on Tuesday, Sir H. Vincent asked the First Commissioner of Works whether the block of buildings at Abbey Mansions, Victoria-street, at which the roof recently fell, was exempt from the provisions of the London Building Act, 1894, by reason of the fact that the County Council had never brought to the attention of the Commissioners the question of exemption or inquired whether any exemption was claimed; and whether the Commissioners caused the height of the building to be raised. Mr. Akers-Douglas: I am advised that no exemption whatever

from the Building Act, and no privilege can attach to the building by reason of any Government exemption or privilege. An agreement was entered into last November under which in certain eventualities the Commissioners of Works might have become lessees of the building when fully completed, but until then they have no present interest in it, and they have never been in occupation. My department has exercised no supervision whatever, nor made any prescription in regard to the matter, and no responsibility in regard to the structural construction and solidity attached to the department and was undertaken by it. The County Council never brought the matter to the attention of the department, and made no such inquiry. If they had they would have been informed that no exemption existed so far as the Crown was affected. The Office of Works did not cause the height of the building to be increased.

BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.—The third annual general meeting of the British Association of Waterworks Engineers, which lasts over four days, opened at Southampton on the 24th inst. Mr. W. Matthews, the Southampton Borough Waterworks Engineer, took the chair as president-elect for the year and delivered his inaugural address. The company, together with a number of residents, were afterwards entertained by the mayor to lunch on the Royal pier. In reply to the toast of “Success to the Association,” the President stated that, although only established three years ago, the Association numbered over 200 members, who had charge of the water supply to 14 million people, and had the care and management of works of the value of over 40,000,000. The afternoon was devoted to the reading and discussion of various papers.

STUDENTS' COLUMN.—Owing to the pressure of other matter, the Students' Column article is held over until next week.

CAPITAL AND LABOUR.

CARPENTERS' AND JOINERS' WAGES.—The executive of the Amalgamated Society of Carpenters, in their official monthly report just issued to the branches, which now number 738, state that lately a record of unprecedented successes in respect to the amicable and satisfactory settlement of the various trade movements has been established. The report further states that advances of wages have been conceded by employers as follows:—At Castleford, Colville, Cromer, Colwyn Bay, Liverpool, Lynn, Lincoln, Mansfield, Preston, Rushden, Leeds, and Gravesend of 2½d. per hour. At Birmingham an advance of 2½d. per hour will come into effect next October. All overtime there, too, is to be paid for at the rate of time and a half. At Leicester a reduction of hours and increased payment for overtime, upon the recommendation of the Board of Trade arbitrator, has been agreed upon; at Whitby an advance of 1s. weekly has been conceded. Alterations in hours have also been effected at Edinburgh, Leeds, Stockton, Carlisle, Maidstone, and Bournemouth.

THE HULL PAINTERS' DISPUTE.—The Mayor of Hull (Councillor Crook) is endeavouring to bring this dispute to an end. On the 16th inst., he met the officials of the Operative Painters' Society, and subsequently he saw representatives of the Master Painters' Association, with the result that a meeting between the two parties was arranged for the 18th inst., when the representatives of the Master Painters' Association and Operatives' Society met at the Town Hall for the purpose of discussing the points in dispute, viz., the suggested advance in wages of one halfpenny per hour, and the proposed alteration of working rules. The conference opened at 4 o'clock, and was not concluded until 7.15, no settlement having been agreed upon. The masters offered to grant the increase of one halfpenny, but stipulated it should not come into operation until January 1. They also expressed their willingness to agree to the proposition that an independent gentleman. At the present time the Board consists of an equal number of representatives of both parties, the chairman being appointed from one of that number. Another proposal by the employers was that the number of apprentices allowed should be increased from four to six. This was opposed by the men's representatives, who declined to accept the employers' proposals, but it is understood they will be submitted to another meeting of the men.

BRICKLAYERS' STRIKE AT CHELMSFORD.—Some of the bricklayers at Chelmsford have come out on strike for higher wages. Last November the local branch of the Bricklayers' Union gave six months' notice that they would require an advance of a penny an hour. Some time ago the masters decided to give an additional halfpenny per hour, but this the men deemed insufficient. Some of the firms, however, have made full concession.

FIREBRICK WORKERS' WAGES, TYNESIDE AND DISTRICT.—The result of the ballot by the firebrick makers of Tyneside and district is, it is stated, in favour of accepting the employers' offer of an advance of 2½ per cent. on time and piece rates, and a minimum of 6d. per week to boys. In response to the wish of the employers, to desire all future disputes to be settled as far as possible by a conciliation board, the men have appointed four of their number, along with the district delegate, to meet the em-

ployers, to discuss a basis upon which the conciliation board can be formed.

BRICKLAYERS' WAGES IN THE POTTERIES.—Mr. Talbot Baines, the arbitrator in the recent investigation with regard to the wages of bricklayers, has forwarded to Mr. James Bowden, the secretary to the Master Builders' Association at Burslem, a communication in which he states that after careful consideration of the arguments, and the information before him bearing on the condition of the building trade in the Potteries district, and also the state of the chief industry of the district, he was of opinion that no sufficient ground existed for disturbing the rate of wages for bricklayers fixed by Sir W. Markby's award. He, therefore, awarded that the rate should continue to stand at 8¼d. per hour.

BUILDING TRADE DISPUTE, STOCKPORT.—Nearly all building work at Stockport is at a standstill, owing to a dispute between the master builders and the bricklayers. The question at issue is with the Operative Bricklayers' Association, and has reference to the various points from which the men are allowed “walking time” to the buildings where they are employed. In Manchester the radius is two miles from the Exchange. The Stockport employers contend that under their propositions, the radius would be not more than a mile and a half from the centre of the town, and that a recent advance in the wages of the bricklayers was accompanied by a tacit understanding that the boundaries would be extended, in proof of which assertion it is pointed out that the joiners, masons, and painters have accepted the new boundaries. The old “walking places” have been observed for twenty-five years, and the bricklayers decline to accept any alteration in the most important routes north and south.—*Manchester Courier.*

BUILDING TRADE DISPUTE AT HOLMFIRTH, YORKSHIRE.—The Holmfirth masons' labourers applied to their masters on the 16th inst. for an advance of wages from 5d. to 5½d. per hour, and met with a refusal. The men struck work, and posters were issued announcing the dispute.

DARLINGTON LABOUR TROUBLES.—The building trade in Darlington is practically at a standstill owing to the bricklayers' labourers having come out on strike. On April 23 the society men handed in a demand to the employers for an increase of 3d. per hour, their present standard wage being 5½d. per hour, and the reason given for the demand was that they were paid below the average of other towns. The masters declined not to accede to the demand.

WAGES IN THE SOUTH SHIELDS BUILDING TRADE.—At the end of last month the joiners, mill-sawyers, and machinists engaged in the building trade at South Shields handed in a three months' notice for an advance of wages from 9d. to 10d. per hour. A few weeks ago the Master Builders' Association decided to offer the men an advance of one halfpenny per hour. It is now understood that this offer has been accepted by the men, and their notice to come out at the end of the month has been withdrawn.

STONEMASONS' DISPUTE IN MANCHESTER.—The agitation in some departments of the building trade for an alteration in the conditions of labour has extended to the Manchester district. The stonemasons have made a series of applications to their employers which include an alteration in the working hours and an addition to the rate of wages per hour. They also object to the employment of workmen on stone-dressing machines at lower rates of wages than those paid to stonemasons, by whom the work was formerly done, and to the importation of worked dressed stone into Manchester. A limitation of the number of apprentices is also demanded. As regards the employers, the matter has been taken in hand by the Employers' Federation. The demands of the men will be resisted.

THE SWANSEA MASONS' STRIKE.—The Swansea masons having rejected the masters' proposals, have decided to form into a co-operative society, to tender for and undertake any work which may be on offer in the town.

CARPENTERS' LOCK-OUT AT NEWPORT.—The final conference between the Master Builders' Association and the carpenters and joiners proved abortive. Each side submitted its ultimatum, but the views of the respective parties were found to be so hopelessly at variance that it was impossible to come to a settlement. The employers thereupon re-opened their shops, and offered work to any men who cared to return under the working rules which were formulated in 1892. The primary cause of the dispute is the percentage on overtime. The carpenters object to work after five o'clock, and the masters are unable to make it a regulation that their shops shall close at that time unless other branches of the building trade will fall into line. Only a few of the men resumed work on Monday. A good many of the society workmen have obtained employment in other towns.

LEGAL.

THE WESTMINSTER BUILDING DISASTER.

At the Coroner's Court, Horseferry-road, on Thursday last week, Mr. John Troubeck, the Westminster Coroner, resumed his inquiry (with Mr. John Slater as assessor), into the deaths of William Clifford Morse, Joseph Henry Parker, Charles Weather, Ernest George Lillywhite, Hugh John Bray, George Bridge Hillings, and Henry Clements, who were killed through the collapse of a building in Orchard-

street, Victoria-street, Westminster, on the 21st ult. Mr. Blenkinsopp, one of her Majesty's Inspectors of Factories, appeared for the Home Office; Mr. A. C. Kent for Mr. W. Rickard, the chief contractor of the works; Mr. A. Thompson for the General Labourers' Amalgamated Union; Mr. G. S. Edwards for the roof contractor, Mr. S. Murrell; Mr. Hugh Fraser for Mr. Drury, the District Surveyor; Mr. A. A. Hudson for Messrs. Drew-Bear, Perks & Co., and Bank's Fireproof Construction Syndicate; while Mr. T. Blashill, Superintending Architect to the London County Council, and Mr. Seager Berry, appeared for that body. Mr. Horace Avory appeared for Mr. Pawley, the architect.

Mr. E. Drury, the District Surveyor for St. Margaret's, St. John's, and St. Peter's Within, Westminster, whose evidence was taken the previous day, re-entered the witness-box for cross-examination.—By Mr. Avory: The total weight on the base of the pier was sixty-six tons, and it would take 270 tons crushing power to break or crush the pier at the base, presuming that the pier was properly constructed all through.—Mr. Avory: But as regards the walls, if soft bricks were being used would it not be your duty to report the matter, with a view of further proceedings? Yes, decidedly.—Mr. Avory: Would the statement of Collins that soft bricks were extensively used be true? I did not see any soft bricks, and did not believe that any could have been used without my knowledge.—The Coroner: I might here say that, with regard to the evidence of Collins, I shall advise the jury to dismiss his evidence from the case, for his statements have been disproved by the other witnesses, and, although he may have been right in some facts, it would not be safe to take merely part of his evidence.—Mr. Avory: Now as regards the girders, would it be true that they were not bolted together? Certainly not.

—The Coroner: I do not think that point need be further considered, as I think the evidence has brought us down to simply the pier and concrete.—By Mr. Gardiner (the United Builders' Labourers' Union): Since he had been in the court his opinion respecting the concrete had entirely altered, and now, having heard all the evidence, he would say that he did not attribute the accident to the concrete. He would say either the pier fell and knocked down the girders, or the girders fell and knocked the pier down.—James Lillywhite, brother of the deceased Ernest George Lillywhite, re-called, said that he wished to add to his evidence. On the day before the accident he had his attention drawn by one of the other workmen to several cracks near the basement of the pier, and these cracks were about 3 in. or 8 in., and a trowel went into them quite 3 in. He never mentioned about the cracks to any one in authority at the time.—By Mr. Marshall: He had thought a lot about these cracks since his brother's death, and had told some of the workmen about it, including Clement's brother, but he had not made any statement to his solicitor on the subject.—Mr. Marshall: Have you told any one particularly?—Yes, two days ago I discussed it with one of the jury.—Mr. Marshall: That is most serious. The Coroner: If that is so, then you can quash the inquisition. There is no doubt that a jurymen did have this conversation. As I know who it is, and as there are fourteen of them, the particular jurymen could be discharged from any further part in the proceedings. I will adjourn for luncheon now, and during the interval I will get a proper explanation from the jurymen.—The Court then adjourned for luncheon.—After luncheon the Coroner said he proposed to put Lillywhite back in the box to fully explain what had actually occurred between him and the jurymen.—Lillywhite was again called, and said he had told the jurymen about the cracks, but he did not then know he was a jurymen.—Mr. Avory: Yesterday you said nothing about this pier being cracked.—Witness: No, I was too ill.—The Coroner said that the point was an entirely new one to him in his experience; but, after a full study of the position, he felt that he had no power in the matter to dismiss any juror from the box on such a point.—Mr. Avory: I will reserve my right in the interests of my client to challenge this part of the inquisition.

Mr. C. J. C. Pawley, the architect, recalled for further examination, said he was the owner, he believed, of the freehold under the *centring* trust. Mrs. Leeds became his trustee when the building was taken over from the Greycoat trustees, and under a building agreement she undertook to do certain things. He had nothing to do with arranging the sub-contracts, but he directed Banks' fireproof work and his assistant, Mr. Simpson, directed Murrell's work. After a time the plans for the south block were altered, and those proposed were prepared by the witness. They showed how he wished the south block to be erected. The pier was to run up from the first floor level to the seventh floor, about 84 ft. Provision was made in the basement for a stanchion. The dimensions of the pier being given as 4 ft. 3 in. by 1 ft. 6 in. were the result of a draughtsman's error. He admitted, however, that the plan was given to the contractor to work from. He supposed Andrews set out the pier to what he thought was the proper size and left it to the witness's representative. He could not remember making any calculations about the pier, but his representative probably did. He designed the roof. The original plan showed a wooden roof. The stanchion was not put in because

the engine and machinery occupied the space where the footings were to be. He admitted that a stanchion was desirable, and that it should have been run up with the building. He had insisted on the engine and machinery being taken out. The stanchion was not ordered because there was no room for it. He gave his assistant strict instructions not to strike the centring, having in his mind the possibility of an accident. He still thought the collapse was due to the falling of the concrete, but he could not say why it fell. Asked by the coroner what training he had had, Mr. Pawley said he was taught in the Architectural School at South Kensington, after which he was for seven years in the office of his father, who was a surveyor. He had built a great number of buildings similar to this, and was now erecting houses of the same description.

The coroner then took the medical evidence, and adjourned the inquiry until Monday morning.

Mr. Pawley, who was recalled and re-examined by Mr. Horace Avory, said that he had had fifteen years' experience, and this was the first time he had ever had his work questioned. In the last ten years he had carried out over 400,000 ft. of work, including some very intricate work on the Metropolitan District Railway, and this was the first time he had ever experienced a fatal accident. He had now prepared calculations showing the weight on the pier at the time of the accident, and those calculations he now proposed to submit to the Court. The Banks' fire-proof flooring was 25 lb. to the foot, but he had not worked out the cubic. He made the total weight at the time of the accident as 53 tons 8 cwt. 20 lb. at the base of the pier, and his own weight. Where it left the walls at the second floor the weight of the brickwork alone was 24½ tons and below 14½ tons. The weight of the ironwork, including the carriage girders and lacing joists was 4 tons 6 cwt. 13 lb., and the weight of the second, third, and fourth floors was 1 ton 10 cwt. 40 lb. for each floor. The concrete of the roof was 2 tons 8 lb.—Mr. Avory: Now, was the pier capable of bearing that weight?—The Witness: Certainly.—When did you first hear of the cracks in the pier?—When the witness said so in the box.—Now, in your experience, is it for the architect to say when centring is to be struck?—It has always been so in my experience.—On this building?—Yes, on the north block.—Have you ever given any instructions for any centring not to be struck?—Yes, repeatedly.—And were your instructions always carried out?—Yes, without exception.—The Coroner: I find the dimensions on this plan of the pier are different to what we have been given in evidence. Who drew this plan?—The Witness: One of my staff, but I cannot say which.—But who gave the information from which they were drawn?—One of my staff.—But what I want to know is, who?—I cannot say.—Mr. Avory: But surely a man can recognise his own work?—The Witness: I cannot say. I am responsible, and get the details from one of my staff. I drew some of them in pencil.—The Coroner: I want to know where you got the details from?—The Witness: From one of my staff.—But whom?—I really cannot say.—We have had the dimensions given different to this plan. Can you give us the details apart from this plan?—No.—Then how did you get this plan out?—From the details I received from one of my staff.—Then let us have the names of your staff?—The witness gave them, after some delay.—The Coroner: When was this plan drawn?—About a week after the accident.

Mr. Amnest, representing the Commissioners of Works, in answer to the Coroner's question, could not say whether they intended to call any witnesses.

The Coroner.—I want to get the inquiry finished this week, and I suppose every one else does.

Mr. Thorpe (recalled) was also questioned on the plans regarding the brickwork, but said he did not see any specific details.—The Coroner: Do you mean that the plans you worked from contained no details of the brickwork?—The Witness: I never saw any.—Then I am afraid there is no one in this Court but what has been misled. Are you positive?—The plans I saw were on thin sheets, but I saw no details for brickwork.

Mr. H. H. Collins, architect and surveyor, stated that he was District Surveyor for the eastern division of the City of London, and that he had visited the Abbey Mansions repeatedly.—Mr. Avory: And have you formed any theory as to the cause of this disaster?—The Witness: Yes, I have.—The Coroner: And what is it?—The Witness: I would attribute it to the very unfortunate removal of the centring before the concrete had become properly solidified. The Witness said he had examined the plans of the roof concrete and found it very good.—Mr. Avory: Quite suitable for the building?—The Witness: Most decidedly.—In your opinion, having examined the concrete, how long should it have been up before the centring was struck?—Quite fifteen days, but really it should have been twenty. Nine-inch concrete such as this would not be ready for striking for fifteen to twenty days. When I say fifteen to twenty days I mean the maximum for safety; but if we had bright sunny weather it would be struck out the concrete to the extent of perhaps two or three days.—Is there any rule in the trade regarding this?—In my own experience there is; in my specifications I always say something regarding it.—What is it you generally say?—I specify the fact that on no

account is the centring to be struck until the architect gives his instructions for it to be done.—Then in your experience it entirely rests with the architect?—Most decidedly.—The Coroner: Then you think that the striking of the centring caused the disaster?—The Witness: It is unfortunately so.—Mr. Avory: Can you explain what state this concrete was in when it fell?—The Witness: In a pasty, humid state.

At this stage the inquiry was adjourned until Tuesday, when

Mr. Collins was further examined. Presuming the concrete roof caved in, he said he would expect to find the concrete in small pieces, and it would crash in with great force. The concrete would strike the carriage girders, causing them to act as a lever or battering ram against the pier.—The Coroner: Do you mean the girders knocked it down?—The Witness: I mean that the girders levered it up and threw it. The concrete fell first.—Mr. Avory: Had the pier been larger would it have been able to resist this sort of ram?—Nothing could have withstood the fall of the concrete. It would fall 16 ft. in a second with a power of 2½ tons. Continuing, witness said he would estimate that the pier was struck within a second or two of the concrete falling, and the whole collapse would take place in a few minutes.

—If the pier were improperly constructed where would you have expected it to collapse, presuming that it did so?—At the level of the first floor. In reality this was not a pier, but a series of piers on top of each other.—The Coroner: What was the weight on the pier on the first floor level?—45 tons 3 cwt.—What would be a safe load on this pier?—6½ tons 4 cwt. per foot superficial.—Mr. Avory: Then that means that it would require eight times that weight to crush that pier?—Yes; and concrete brickwork also is estimated to withstand a load of 50 tons to 70 tons super.—The Coroner: On what calculations do you state these figures?—I quote from the authorities, Professor Rankin and Professor Unwin.—Was the brickwork of this pier good?—The fact that it had already withstood the great strain of the walls proves that it must have been the best brick and cement work.—Mr. Avory: Had the stanchion been there could it have saved the pier falling?—No.—Mr. Thompson: When the workmen began to remove the centring, and a few pieces of concrete fell, would it not tell the men to stop?—The Witness: It should; but you do not know a British workman. It might indicate danger, but it is marvelous the risk he will run. I have almost had my heart in my mouth when other people could not comprehend the risks run.—Mr. Gardiner: Do you agree with Hurst's book that a pier should not be built higher than twelve times its thickness at the base?

—The Witness: An isolated pier or column like the Monument, yes. In building a pier an architect is usually supposed to have a little common-sense, and to know how to use it.—Mr. Griffith: Do you find fault with anything used in the construction of this building?—Well, no, I do not.

Mr. William Eve, of Old Broad-street, a Fellow of the Surveyors' Institution, stated that he had considerable experience in the construction of buildings. He had examined the Abbey Mansions, and was of opinion that the load on the brick pier weighed 53½ tons, which would be a safe load. The fact of the pier being found in large pieces showed that it was of good construction. As to concrete roofs, he would not like to strike the centring in less than fifteen days, and he would prefer twenty days. He attributed the accident to the centring being struck too soon. The fact that the building fell while the centring was being struck confirmed him in that view. His idea was that the concrete fell on the carriage girder of the seventh floor, at a distance of 11 ft., pressing the girder down and prizing up the pier. No doubt the pier dragged down the girder joists and the brickwork.—By Mr. Avory: There was lateral pressure in concrete. In the flanges the concrete would have a bearing of 23 in. If the "green" or unset concrete fell the consolidated concrete would follow as soon as the pier was disturbed. The whole accident might have been the work of only a second or two.—Mr. Thompson elicited from the witness that there ought to have been a stanchion. He did not agree with Mr. Collins as to which was the weakest part of the pier.—By Mr. Gardiner: If the pier had given through having too much weight upon it it would have collapsed on the first floor.—By Mr. Griffith (for Mr. Murrell): He had only a scientific interest in the matter, but he was asked by Mr. Pawley to investigate the case. He did not agree with everything Mr. Collins had said. He had known many buildings to be built without plans.—Examination continued: It was not absolutely certain that concrete would fall vertically.—How long does it take concrete to expand?—Well, sir, I've been twenty years trying to find that out, but I have not succeeded yet.—Continuing, the witness said it was not proper to put the girder into the flue without a stanchion being put in. Some of the concrete must have fallen before the pier lurched. Without the stanchion the pier would not have been sufficient to support the building when it was occupied.

Mr. E. A. Gruning, Vice-President of the Royal Institute of British Architects, said concrete should not be struck until about three weeks after it was

laid. Some of the concrete he saw on April 29 he could rub with his foot. He had heard the dates upon which the roof was concreted and the centring struck, and thought it could not have hardened sufficiently to render the striking safe. In his opinion the concrete falling on the girders caused the pier to collapse. It would have required a very much larger pier to have resisted the falling of the concrete roof.—By Mr. Griffith: He was once in an accident himself, and afterwards found that the impressions he formed were absolutely incorrect as to what happened.—By Mr. Avory: He thought it extremely unlikely that the first thing that happened was the buckling of the pier.

Frederick Rough, a labourer, said he was employed on Abbey Mansions, and while working in the basement on the day of the accident, he called the attention of Mr. Andrews, the general foreman, to some cracks in the pier. Andrews attributed them to the engine. Two of the bricks of the pier were crushed, and there were cracks all round it at a distance of 4 ft. from the base. Andrews told him that the bricklayer was going to strengthen the pier.—By Mr. Avory: He was certain there was a pier and not a wall in the basement. He would swear there was an archway over the pier.—The Coroner: I believe there will be some extraordinary circumstances in this case even up to the last second.—By Mr. Avory said, so far as he knew, no plan showed a pier in the basement.

James Andrews, the foreman, recalled, said the archway was carried on to the chimney breast, not on to a pier. He declared in the most emphatic manner that Rough never spoke to him about cracks in the pier. He noticed some scratches on the wall; they were caused while the engine and mortar-pan were being removed.—By Mr. Thompson: He would swear that the conversation alluded to by Rough never took place. He did tell some of the men that the engine had knocked a corner off that he did not know all the men. He did send a man up to examine the pier on each floor, but the thought of strengthening the pier never entered his mind.

George Dixey, the man who was sent up by Andrews to examine the pier, stated that he found nothing the matter with it. The archway was carried on to the party wall in the basement. An additional weight was thrown on the pier when the engine was raised.—The Coroner: I never heard such contradictions in important matters of fact.—Walter Ridley, a bricklayer, who was at work in the basement on the day before the collapse, said the archway was right on the pier, as shown in the plan produced. He noticed no cracks in the pier.

The inquiry was adjourned until Wednesday, when Mr. Thorp, recalled, said that the archway said to be near the pier was merely a hole left for the convenience of men who had to pass from one basement to another. Sometimes as many as a dozen such holes are made in buildings for this purpose.—By Mr. Marshall: There were no arching bricks used at the top part of the hole. These holes are filled up before the workmen leave the building.—By Mr. Griffith (appearing for Mr. Murrell, the roof contractor): The hole is at least 4 ft. from the base of the pier. The men could not have walked directly upon the pier.

George Curtis, a bricklayer, corroborated the last witness's statements about the hole in the wall, adding that there was no archway. He had assisted in building the wall, which was toothed into the pier.—The Coroner: It is clear that this hole was as concealed, and only discovered by accident. Almost at the last minute. We had Thorp and Andrews, who admittedly knew of this affair, and yet did not speak about it. In fact, Andrews said there was not a hole.—Mr. Marshall: Andrews ended yesterday that there was an archway. He did not mention a hole at all.

Mr. T. Blashill, Superintendent Architect to the London County Council, said he examined Abbey Mansions. There was no doubt that the fall of the interior of the building was caused by the collapse of the pier. The pier was built of fairly hard bricks, set in cement mortar. It was connected on one side with a wall, which ran up as high as the first floor. He made the weight of the pier, with everything resting upon it, 48·43 tons, a little less than their witnesses had stated it to be. Its total height was 105 ft. was entirely out of all proportion to its width at the base. He did not make this great experiment the basis of his calculations. The wall adjoining the pier was in mortar, and the pier in cement. Any great strain on the pier would make it break away from the wall. If such a pier as this one should be the best bit out of the upright or badly constructed, or substandard, it would be materially weakened. In this way great height would render it liable to special strain in certain parts. There were numerous calculations with regard to safe loads and crushing loads. It showed a safe load to be slightly under seven tons per foot superficial, but five tons was commonly assumed the safe load for the pier. The pier was constructed as those upon which experiments had been carried out. At each floor the bricks were interrupted by stone templates, which did not directly cover the brickwork. The bricks were cut into small pieces to make up to them. The girders were through six courses of brickwork. In no case

did the height of any girder coincide with any course. The binding girder was packed up with bits of brick and cement. Many of the girders were finished in the middle of courses. The main carriage girders on each floor rested more on one corner of the pier instead of in the centre of it. In this way the pier on each floor was materially weakened and considerably overloaded. He had no doubt at the time of the accident that the pier was in places dangerously overladen, which overloading was daily increasing. He thought from that cause the pier might have collapsed at any time; in fact, if it received any appreciable shock it would have been bound to fall. It was not necessary to assume a fall of concrete. Had that not fallen at the time the centring was being removed, a fall of concrete would hardly have been suggested as the cause of the accident. He had been told by the chemist of the London County Council, who tested the cement, that it was generally good. The concrete varied in quality, some being made of clinkers and some of ashes. So far he had not heard definitely that any coke breeze had been found. This varied quality would account for the concrete falling in large and small bits.—By Mr. Kent, representing Mr. Rickard, the contractor: It is suggested that the concrete was not good. That I would suggest should be proved if a point is made of it.—The Coroner: If the question is raised I will have witnesses to prove from what part of the building it came. Mr. Blashill: I can produce specimens which were examined, and which were not of a very good quality.—Mr. Griffith: I understand the concrete produced came from part of the building, not necessarily from the roof.—The Coroner: We will prove where it comes from.—Mr. Blashill: I should not think it unsafe to strike the centring of coke breeze when it had been up as low as the roof of Abbey Mansions had been up. We have struck centring under 45 in. thick coke breeze floors in a week or ten days, and it has been done in less time, and the floors freely walked over. That coke breeze was of excellent quality, and well made. This roof in Abbey Mansions, when struck, should have carried itself unless some part was bad. I venture to doubt, however, it fell, whether it would have caused the collapse of the pier. The concrete in falling would, I think, slew round before striking anything. The first warning of the disaster would be the knocking or crashing of the concrete against the girder on the seventh floor, or the fireproof flooring below that.—The Coroner: What are your views of the powers of the County Council over buildings?—Mr. Blashill: Mr. Drury, Westminster District Surveyor, was right when he said he had only limited powers. The District Surveyor, under the existing law, has no control over piers and girders such as those put in Abbey Mansions.—The Coroner: Do you wish to give any opinion?—Mr. Blashill: Personally and as a public officer, I think there should be very great control over such things. I think London is exceptional among large cities, whether on the Continent or in America, in being without control over those affairs. I have examined the building plans for flats or mansions in large cities, such as Berlin and Buda Pesth, and I have seen them scored through in blue pencil by officials, increasing the size of girders and piers beyond the dimensions given by the architects.

Mr. Alfred Wilkinson, assistant to the Engineer's Department of the London County Council, said he had taken the two pieces of concrete produced in court by Mr. Blashill from the roof. They were taken to the office and given to Mr. Blashill.

Mr. Blashill, in reply to Mr. Marshall: I am satisfied that the pier was well built as regards the height of ten or twelve times the least diameter of the base of the pier refers, I think, to iron piers. The experiment has not been made with bricks and mortar. The pier in question was laced up and braced up with carriage girders and lacing joists. If the foundation of a pier be perfect, and the weight perpendicular on the base, the safe load need not be calculated with the same care as would be required if the lacing joists were not there. I think a safe load is five tons per foot super, although many prudent people say about seven tons. The piers upon which experiments were made were built of selected bricks.—Mr. Marshall: Then do you say that these results are of use in everyday life, when every brick used is not specially selected?—Witness: Yes, I do. I accept the table which shows the results of these experiments. Similar piers in those experiments were not always bear the same load, and yet the bricks were crushed. These results must be considered carefully. A man cannot say a certain pier bore thirteen tons and another thirty-nine before the bricks were crushed, and then say what a pier he was constructing would bear. In regard to the pier in Abbey Mansions I say to Mr. Gruning was wrong in saying that seven tons was a safe load. If he were to say he had built and tested a pier the same as this one, I would agree with him. A load exceeding a safe load, does not become absolutely unsafe, but it is experimental in placing it upon a pier. I won't say seven tons is a dangerous load. I do not think calculations were made to say what a pier with a load greater than a safe load would betray signs of being overloaded. It is difficult to calculate the weakest point, but he would say at the various floors the pier was weak. You must remember

that this is a pier 105 ft. high, imperfectly tied. Mr. Marshall: Why imperfectly tied?—Witness: Because the girders were not properly placed upon the pier. I think the structure was bad because there was no proper bed for the girders, and that they were placed in the middle of courses.—Mr. Marshall: Are not the bits of brick with the mortar which were used between the girders as good as the other stuff?—Witness: No. Besides, the girders resting on one corner of the pier, the pressure on that side would be great, and a pier breaks at a point where the pressure is greatest. The danger of overloading commenced, I think, about the second or third floors. The danger of crushing began at the base, the danger of cracking on the second floor. The increasing weights and imperfect lacing tended to create a great danger. Above the fifth floor, where there were no lacing or tying joists, there was a possibility of the pier buckling. This tendency to buckle would increase as the height of the pier was added to. Of course, the concrete caused the fall of the pier, but I am firmly convinced that the pier would have fallen if it received any appreciable shock. If, however, the pier had been properly tied and all the lacing and girders in place, and the concrete had fallen when in a softer state, the rest of the building would, I believe, have remained standing.—By Mr. Marshall: If a piece of soft concrete fell, causing a larger piece to follow, it might have required a stronger pier to withstand the shock than the one in Abbey Mansions. By Mr. Griffith: I do not think the pier was safe at all. Of course, I am not prepared to blame any one about reducing the size of the pier.

Mr. E. A. Gruning, architect, recalled, said he saw absolutely nothing in the construction of the pier to suggest to him that it was the cause of the accident. It was, he thought, well built. Of course it would have been advisable to have the girders in the middle of the pier in preference to one side.

Mr. Murrell, roof contractor, recalled, produced the receipted bills for the coke breeze supplied for the roof.

The Coroner then adjourned the inquiry till Thursday morning.

[The verdict of the jury was given just as we went to press: it is embodied in our leading article.]

ALLEGED INJURY TO BUILDINGS BY THE WORKING OF COAL MINES—CASE IN THE CHANCERY DIVISION.

The case of *Thicknesse v. the Rose Bridge and Douglas Bank Collieries Company, Limited*, came before Mr. Justice North in the Chancery Division on the 17th and 18th insts. It was an action in which the plaintiffs sought an injunction to restrain the defendant Company from working the coal in the Douglas Bank Colliery nearer to the plaintiffs' buildings near Wigan than seventy yards, and so depriving the plaintiffs of their rights to support.

Mr. Macnaughton, Q.C., and Mr. Beddall appeared for the plaintiffs, and Mr. Vernon Smith, Q.C., and Mr. Thompson for the defendants. Mr. Macnaughton, in opening the case, said that plaintiffs did not ask for any relief in regard to what the defendants had done, but only in respect of what they were proposing to do, and he understood it would not be disputed that what had been done might be injurious to the plaintiffs. The defendants were a mining company and were entitled to work these mines. In respect of the mine the working of which was said to cause damage to the plaintiffs' premises, they were lessees. With regard to one mine, they were the owners of the surface as well as the mine underneath. With regard to the other, they were the owners of the surface but not of the mine. With regard to the one of which they were the owners of the surface, there might be a question of whether on working they would or would not be entitled to let down the buildings on top of the mine, but he did not propose to trouble the court with that question, as his case was that whatever would affect those buildings would affect the others, for which he should submit he had an undoubted right to support. The plaintiffs' buildings were all ancient buildings, and the land was one large coal field with several seams running under it. The seam that the defendants were at present working was 1,235 ft. below the surface, and was a 4-ft. seam. The damage to the plaintiffs' property had been going on for a considerable time, but had only been recently discovered. If the defendants were allowed to work out the rest of the coal within the seventy yards area, the damage would be considerably increased.

His lordship asked if there was any magic in seventy yards. Mr. Macnaughton replied that that area was only taken as the area which the plaintiffs considered necessary for the support of their buildings. At present the defendants had only worked in one line towards the west. That would tend to give the plaintiffs' buildings a list in one direction; but if they were allowed to work also north and south the plaintiffs' buildings would have a list in three directions, and much greater danger would result. Really the only question between the parties at the time of the commencement of the action was whether the defendants, in working the coal under the buildings, were to be responsible for surface damage or not.

Mr. Thompson said he was not prepared on behalf of the defendant to accept the responsibility, and was afraid the case must go on. His case was that no damage had as yet occurred through the defendants' workings, and that there was no probability of damage. He would not, however, dispute that if in the future damage did occur defendants would be liable.

After hearing further evidence, his lordship in giving judgment said, it was admitted that there had been practically no damage or subsidence as yet, and the injunction was sought to restrain an apprehended damage. The conclusion to which he had come was, that the evidence was not strong enough to say that the requirements of the law for such an injunction had been satisfied. Unless substantial damage had been proved the Court would not interfere, or if no actual damage had been proved (as was the case here) there must be proof of imminent danger, and there must also be proof that the apprehended damage, if it came, would be very substantial; in fact, almost irreparable. Whilst he did not say that damage might not ensue to the plaintiff's buildings, yet the evidence did not satisfy him that the damage was either imminent or likely to be substantial. The action would be dismissed, with costs.

CASE UNDER THE EMPLOYERS' LIABILITY ACT.

At the Marylebone County Court, on the 16th inst., before Judge Stonor and a jury, the case of *James Stenor v. Messrs. Price, Contractors of the Central Railway between Shepherd's-bush and the City, under the Employers' Liability Act*. Mr. Hutton, who was counsel for the plaintiff, said his client was a miner of many years' experience. On January 20, whilst engaged in boring the tunnel referred to, he was severely injured by 7 cwt. of clay falling upon him in consequence of a defective "shield," about which several complaints had been made to the foreman of the works. Mr. Hutton added that both the plaintiff's legs were broken, and he was otherwise badly injured. His wages were £3 10s. a week. The plaintiff, who bore out counsel's statement in detail, limped into the box on crutches. In reply to the Judge, the plaintiff said that planks used for roofing the tunnel had been used previously for Jubilee seats. William Harris, a "shield foreman" in the defendants' employ, said, in reply to his Honour, that he considered the "shield" safe, but admitted that at times they were short of timber for the settings. The jury found for the defendants.

CASE UNDER THE LONDON BUILDING ACT.

At the Guildhall, on the 17th inst., Messrs. E. Lawrence & Sons, Wharf-road, City-road, were summoned for having, on April 5, at 2 and 4, Cripplegate-street, contravened the Building Act, 1894, by making certain alterations without the consent of the London County Council, in such manner that separate sets of rooms contained in the building had been adapted to be tenanted by different persons without the floors and principal staircase being constructed of fire-resisting materials, contrary to Sections 74 and 207 of the Act. Further, that there was an omission to make the floors and principal staircase of fire-resisting material, and a non-compliance with the District Surveyor's notice. Mr. Seager Berry appeared in support; and Mr. G. H. Mallinson represented the defendants. Mr. Berry said it was of the utmost importance, especially after the lesson taught by the great fire at Cripplegate, that the provisions of the Building Act should be complied with, more particularly with regard to those sections dealing with fire-resisting materials. The building in question was erected for one occupation, but subsequently alterations were made in order that the place might be let out to various tenants. The basement and first floor were built of fireproof material, but no other parts. There were two staircases—one going from the house to the top floor and the second only to the first floor—and the building, although originally intended for only one occupation, was now let out in separate tenements. Mr. E. Woodthorpe, District Surveyor for the northern division of the City, said he had never given his consent to the alterations made in this building, which consisted of a warehouse with basement, and five stories above. The effect of the alteration was to entirely cut off the ground floor and basement from the other part of the building. Cross-examined by Mr. Mallinson, the witness said one could not get from the basement to the upper floors without going into the street. The basement and ground floor were separated from other parts by fire-resisting material. By the Alderman. There was only one staircase that was of any use for the whole of the building. It was "adapted," but not "constructed," for two separate buildings. Mr. Mallinson did not dispute the facts, but held that the section of the Act did not apply to this case, and that the alterations had virtually made these premises into two distinct buildings. This was essentially a warehouse; the section of the Act under which the defendants were summoned referred to sets of offices, sets of chambers, precisely like those in the Temple, or the

many offices that were in the City. The Alderman remarked that, after most careful consideration, he had come to the conclusion to dismiss the summons, without costs. He hoped the Council would ask for a special case, as he would be most happy to grant one.—Times.

INFRINGEMENT OF ANCIENT LIGHTS IN CANNON-STREET.

The case of *Bywaters & Sons v. Gordon* came before Mr. Justice North, in the Chancery Division, on the 20th inst., on a motion by the plaintiffs for an injunction to restrain the defendant from erecting, or continuing to erect, a wall or building then in course of erection by the defendant to the east of the plaintiffs' premises in Cannon-street, E.C., at a greater height than the wall of the old building of the defendant's premises on the same site recently demolished by him so as to interfere with the plaintiffs' ancient lights to the windows fronting on to Bread-street, and facing the defendant's new building.

His lordship granted an injunction restraining the defendant from interfering with the plaintiffs' lights, and gave the defendant a week within which to pull the wall down.

IMPORTANT POINT UNDER THE PRIVATE STREET WORKS ACT, 1892.

The case of the *Mansfield Corporation v. Butterworth* came before the Divisional Court of Queen's Bench, composed of Justices Wills and Kekewich, on the 20th inst., on a special case stated by the Justices of the Mansfield Division of Nottingham, before whom certain objections, made under Section 7 of the Private Street Works Act, 1892, by the respondent, to certain proposals of the appellants with reference to a street called Quarry-lane, were heard. It appeared that the appellants within the borough resolved, in pursuance of the Act, to execute certain works of paving, &c., in part of Quarry-lane, and specifications of the proposed works, with plans and sections, an estimate of the expenses and a provisional apportionment were duly prepared and approved by the appellants. The provisional apportionment included a piece of land belonging to the trustees of "Bellamy's Charity," having a frontage of about 200 yards on Quarry-lane, and hereafter referred to as the respondent's land. The respondent objected to the proposals of the appellants on the grounds specified in Section 7 (d) of the Act, namely: "That the proposed works are insufficient or unreasonable, or that the estimated expenses are excessive." The proposed works were intended to be done over a part of Quarry-lane, about 677 yards in length. Over and along such part of the street, for several years past, there has been a considerable traffic, both vehicular and foot, and during the past twelve months such traffic has increased, and is still increasing, in consequence of the erection of a street of houses on land abutting on and adjoining Quarry-lane, but at a further distance from Mansfield than the respondent's land. Vehicular traffic between the new streets of houses and Mansfield passes through Quarry-lane and over the portion thereof on which it was proposed to execute the works above referred to. There is no made roadway or footpath, and no foundation to the road, which is uneven, with very deep ruts, but there is a footpath irregularly demarcated with rough stones. There are no sewers to carry off the sewage of the houses erected and in course of erection in the said new street or of the houses adjoining Quarry-lane, and there is no provision for lighting it. The average width of Quarry-lane throughout the 677 yards was about 16 ft., and for several yards opposite respondent's land the width is about 12 ft. At other points in the street where the respondent's land does not adjoin Quarry-lane its width is from 14 ft. 6 in. to 16 ft. It was admitted that the estimated expenses stated in the provisional apportionment were not excessive. The respondent objected that inasmuch as it was not part of the plan of the appellants' proposed works that Quarry-lane should be widened opposite any part of the respondent's land, but that the works should be executed whilst retaining Quarry-lane at its present width, the proposed works would be insufficient and unreasonable, having regard to the requirements of vehicular traffic as existing at the present time, as well as the probable requirements of such traffic in future, and that the insufficiency and unreasonableness meant by the statute had reference to the probable requirements of future vehicular traffic as well as, in addition, to the requirements of present vehicular traffic. The appellants, on the other hand, contended that the Justices could not find that the proposed works were insufficient and unreasonable within the meaning of Section 7 of the Act, on the ground only that before any works were done there was a deficiency and unreasonableness meant by the statute must be in respect of the nature and character of the proposed works having regard to the present condition of the street and the traffic over it. The Justices came to the conclusion that the proposed works were insufficient and unreasonable on the ground that the existing width of the highway (namely, 9 ft. roadway and 3 ft. footway) at the

point mentioned was insufficient for a highway, and that such works ought not to be done until the street was made wider. The question for the court was whether the Justices had come to a proper conclusion.

At the conclusion of the arguments of counsel, Mr. Justice Wills, in giving judgment, said it was clear from the Justices deciding that the work was insufficient that they were thinking of the insufficiency of the general scheme for the good of the highway, and that the Justices had applied the wrong principle in dealing with the case, and came to the conclusion that their order must be quashed and the appeal allowed.

Mr. Justice Kennedy concurred.

Mr. Appleton appeared for the appellants; and Mr. J. Chester for the respondent.

ALLEGED INTERFERENCE OF ANCIENT LIGHTS AT HAMPSHIRE.

In the Chancery Division, on the 24th inst., before Mr. Justice North, Mr. Macnaughten, Q.C., mentioned the case of *Williams v. Noakes*, which he said was a motion for an injunction to restrain the defendant from interfering with the ancient lights of plaintiff's house at Hampstead. His lordship had already granted an *ex-parte* injunction which had been continued up to the present time, and Mr. Vernon Smith, Q.C., who represented the defendant, was now willing to give an undertaking in the terms of the notice of motion, the plaintiff giving the usual undertaking in damages.

His Lordship: You both consent to that, do you?

Mr. Macnaughten: Yes, my lord.

His Lordship: Very well.

The motion accordingly stands till the trial of the action, upon the above undertakings.

MEETINGS.

WEDNESDAY, JUNE 1.

British Archaeological Association.—Mrs. Collier on "Some Account of St. Cranlock, an Ancient Cornish Church." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of members. 8 p.m.

Edinburgh Architectural Society.—Mr. J. J. Henderson on "Grammar of House Planning." 8 p.m.

THURSDAY, JUNE 2.

Society for the Encouragement of the Fine Arts.—Third Conversation, at the Royal Society of Painters in Water Colours.

South-Eastern Union of Scientific Societies (Town Hall, Croydon).—Third Annual Congress. Address of the President-elect, Professor G. S. Boulger, F.R.S. 5 p.m.

FRIDAY, JUNE 3.

Royal Institution.—Professor W. M. Flinders Petrie on "The Development of the Tomb in Egypt." 9 p.m.

South-Eastern Union of Scientific Societies (continued).—Several papers to be read, including the following: "Ancient and Modern Dene Holes and their Makers" by Mr. C. Dawson; "The Place of Geology in Education," by Professor L. Looley, F.R.S.; and "Photography in Relation to Science," by Mr. G. H. Baldock. 11 a.m.

SATURDAY, JUNE 4.

Royal Institution.—Dr. R. Caton on "The Temple and the Asclepias at Epidaurus and Athens." 11 a.m.

South-Eastern Union of Scientific Societies (concluded).—12.30 a.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until July 4.

11897. 12,337.—ARTIFICIAL STONE COMPOSITIONS: *W. F. Dymn*.—To produce an artificial stone in imitation of natural red sand-stones, such as red Mansfield or Corse hill, clean sharp sand is saturated with a strong solution of iron sulphate (Fe SO₄) with water; the sand is then made red, hot, whereupon the colourless iron sulphate solution will be decomposed into red ferric oxide Fe₂O₃ possessing an affinity to the iron in the sand, and producing a bright red aggregate, the colour being welded around and into each grain of sand; the whole mixture can be used also as a cement or plaster, or concrete.

11,628.—OUTSIDE WINDOW BLINDS: *L. Leveyer*.—An outside roller for angles and curves has rigid portions connected by flexible parts, each of the latter being composed of (a) a spiral spring, (b) rings or rundles with tenons and grooves, (c) concentric rings articulated together in pairs by gimbal joints and to the rings, and (d) sockets to which the gear wheels are keyed; the whole turning over a fixed central rod keyed to the roller's axle.

11,250.—TRAVELLING JIB CRANES: *F. J. Aradoin*.—The crane has a variable range of jib, is provided with an independent motor, and can be raised and lowered bodily; it consists essentially of a carriage mounted upon two pairs of wheels which can roll on rails whilst transporting the whole structure of a vertical mast resting by a ball-bearing on the carriage, the mast being at about the middle of the carriage, guided by a ring forming the upper end of a conical trestle frame fixed on the carriage; the jib is fixed at its middle point to the top of the mast, or post, in such manner that by means of a chain any inclination can be given to it.

11,673.—WINDOW SASH FASTENERS: *J. W. Cole*.—Each sash has on its vertical edges toothed racks which engage with spur wheels in casings in the frame, the racks being guided by a ring forming the upper end of which locking pawls engage, the pawls are operated to disengage the spur wheels by means of push rods projected from the frame inner side and through the hollow hubs of the wheels and

against the inner side of the spring bars that carry the paws.

17,571.—IMPROVEMENTS IN HANGING WINDOW SHAPES, AND IN THE POCKETS OF SASH WINDOW FRAMES: J. T. Edmondson.—Instead of nailing the ends of the sash ropes to the bottom of the grooves in the sash stiles, the inventor bores a hole in the stiles to the extent of the side groove, and then ties a knot which beds itself in the hole, and is concealed by a threaded plug; he also makes the rope have access to the pockets of each window frame in two parts, by cutting it lengthwise and to a bavel.

17,542.—TILES FOR ROOFING, &c.: J. T. Mason & H. Hardy.—In order that each tile may support two others independently of the holding-down nails, a small flat or boss is formed on the top surface of each tile; the boss is, preferably, semi-circular in shape, having its straight side across the tile, which thus forms a stop or rest for the corners of two other overlapping tiles.

17,573.—WINDOW SASH FASTENERS: C. J. Brooker.—The fastener has a hoop or bow connected to the bottom frame and formed to swivel so that it may pass over and tie down on a projection attached to the top frame, and may be affixed thereto by a thumb or set screw.

17,645.—PIPE JOINTS: J. Price.—The method consists in making a ring socket on the one pipe with an inner annular shoulder integral with the socket, (2) moulding within the shoulder a ring of suitable composition, and fitting into the ring another ring moulded upon the spigot end of the other pipe, the latter fitting up the socket, with cement; the composition for the rings is similar to that used for the "Stanford" Joint.

17,646.—AUTOMATIC GRIPPING APPARATUS FOR ATTACHING SUSPENSION LOANS TO OVERHEAD HAULING ROPES FOR AERIAL CABLE LINES: J. Frigard.—With the casing or box from which the load is suspended are provided two gripping jaws pivoted to the casing, and having grooved surface for gripping the rope; the jaws are so arranged that when the casing is subjected to a downward pull, by the load, the gripping surfaces, in moving up the rope, pass the rope over the jaws, and the casing is relieved from the load, the jaws in moving downwards open out so as to relieve the hauling rope; in moving up the rope, the jaws are operated by a cam or eccentric and a trip, Street Sweeping Machines, 11,059, J. T. Gibson, a Sanitary Key Joint, 11,076, E. Baivry, Telephone installations.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

May 11.—By A. C. Higgs (at Weymouth).

Chestnut-down, "Lycombe Farm," 100 a. £4,150

May 13.—By A. & D. EDWARDS (at Leominster),

Kimbolton, "Kimbolton Court Farm," 31 a. £1,000

31 a. f. 950

Upper Hemor and 16 a. f. 340

Portgate and 24 a. f. 310

Chaston Cottage and 10 a. f. 410

Church, "The Old Manor House," 24 a. f. 610

Finchley—Long-lane, two blocks of building land, 1,210

Squire's-lane, two blocks of building land, 1,170

Green-lane, a freehold building estate, 15 a. 7,900

Ballard's-lane, "The Bird-lane Nursery," 2,500

Green-lane, 22 a. f. 260

Theydon Bois, Essex.—Manor-villas, f. 1,500

Church—three blocks of building land, 1,500

Doddington, Essex.—Bannister's Farm, 31 a. 2,300

May 16.—By HOLCOMBE, BETTS, & WEST.

Northwick, Middlesex—Oakdene, 21 a. f. 2,250

Bloomsbury—New Oxford-st., 1 a. f. 600

May 17.—By PERKINS & CRESKAR.

Hackney—27, Wick-st., with cow-sheds and stabling, 27 a. f. 460

273 and 275, Wick-st., 27 a. f. 410

May 18.—By DEALE & CO.

Mainia Vale—27, 29, and 31, Clarendon-gdns., 50 a. f. 2,300

Hammersmith—25, Glenhorne-rd., 27 a. f. 2,300

Paddington—31, 33, and 34, Delamere-st., 52 a. f. 2,300

8 and 9, Amblerley Mews, 21 a. f. 500

Notting Hill—21, 23, and 25, Charles-st., 180 a. f. 1,600

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May 17.—By BEAN, BURNETT & ELDREDGE.

Ullswater, Cumberland.—"The Leaming House Estate," 72 a. f. 10,000

Brompton—12, Selwood-st., 7 a. f. 600

Forest Hill—Canonbury, 12 a. f. 100

Manor Pk.—37 to 43 (odd), Kensington, 10 a. f. 200

May 17.—By E. & H. LUMLEY.

Pegwell Bay, Kent.—"Great Cliffs End Farm," 111 a. 26 p. f. 2,000

Tottenham—White Hart-lane, two freehold residences, 60 a. f. 1,000

St. Luke's—362 to 376 (even), Old-st., area 5,100 ft. f. 1,780

Enfield—Newmarket, &c., a freehold building estate, 9 a. f. 6,700

Notting Hill—Wheatstone-rd., 12 a. f. 450

Derby—21, 23, and 25, Charles-st., 180 a. f. 1,600

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Derby—21, 23, and 25, Charles-st., 180 a. f. 1,600

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Richmond, Surrey—Kew Foot-rd., "The Tulip Tree," 2 a. f. 275

By HERPER & SONS (at Leeds).

Leeds—Bishopgate-st., "The Scarborough Buildings Estate," area 1,294 yds. f. 1,575

47 and 47A, Briggate, 25 Trinity-st., and premises in Nelson-yd., area 873 yds. f. 2,700

Trinity-st., freehold warehouse, offices, &c., area 304 yds. f. 4,100

By HERPER & SONS (at Armley).

Armley, Yorks.—Town-st., freehold warehouse, workshop, &c., area 1,666 yds. 600

May 18.—By EDWIN EVANS.

Holloway—3, Cardwell-rd., 2 a. f. 7,100

6, Devereux-rd., 2 a. f. 6,000

129, Elthorne-rd., 2 a. f. 7,100

162, Cottenham-rd., 2 a. f. 6,000

58, Cottenham-rd., 2 a. f. 6,000

16, Brook-rd., 2 a. f. 6,000

Barnsbury—7, Sheringham-rd., 2 a. f. 6,000

61, 108, & 131, 330

Harlesden—West Ella-rd., 12 a. f. 450

Wandswoth—56, Wandswoth-rd., 2 a. f. 450

By MARK HUBBARD.

Kentish Town—45, Kentish Town-rd., 2 a. f. 715

1, Falkland-rd., 2 a. f. 6,000

Fulham—56, Bishop-rd., 2 a. f. 6,000

By E. W. RICHARDSON & SON.

Bethnal Green—6 to 9, Manchester-bdgs., f. 1

37, Collingwood-st., 2 a. f. 230

Hackney—29, Dove-row, f. 1,500

68 and 70, Boston-st., f. 400

By SIMMONS & SONS.

Hambleton, Bucks.—Two enclosures of building land, 30 a. f. 1,100

Burrow Farm Estate, 178 a. f. 3,000

By R. & S. SMITH.

Higgate—7, Bishop-rd., 2 a. f. 75

100, 108, & 131, 330

Finchley—58, Lincoln-rd., 2 a. f. 420

By R. TIDY & SON.

Kingsland—23, Downham-rd., 2 a. f. 300

131, 108, & 131, 330

De Beauvoir Town—39, De Beauvoir-rd., 2 a. f. 140

171, Union-rd., 2 a. f. 350

151, Upper Park-st., 2 a. f. 600

By DOUGLAS YOUNG & CO.

Brixton—105, Brixton-rd., 2 a. f. 1,350

401, 108, & 131, 330

Walworth—13, Fleming-rd., 2 a. f. 150

Streatham—6, Kila-rd., 2 a. f. 310

108, & 131, 330

77, 79, 81, and 83, Lewin-rd., f. 1,680

5 and 7, Kempthorpe-rd., 2 a. f. 120

Kennington—5, Ravensden-st., and 41, Stannary-st., 2 a. f. 600

By HERPER & SONS (at Armley).

Richmond, Surrey—Kew Foot-rd., "The Tulip Tree," 2 a. f. 275

47 and 47A, Briggate, 25 Trinity-st., and premises in Nelson-yd., area 873 yds. f. 2,700

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16, Brook-rd., 2 a. f. 6,000

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Fulham—56, Bishop-rd., 2 a. f. 6,000

By E. W. RICHARDSON & SON.

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37, Collingwood-st., 2 a. f. 230

Hackney—29, Dove-row, f. 1,500

68 and 70, Boston-st., f. 400

By SIMMONS & SONS.

Hambleton, Bucks.—Two enclosures of building land, 30 a. f. 1,100

Burrow Farm Estate, 178 a. f. 3,000

By R. & S. SMITH.

Higgate—7, Bishop-rd., 2 a. f. 75

100, 108, & 131, 330

Finchley—58, Lincoln-rd., 2 a. f. 420

By R. TIDY & SON.

Kingsland—23, Downham-rd., 2 a. f. 300

131, 108, & 131, 330

De Beauvoir Town—39, De Beauvoir-rd., 2 a. f. 140

171, Union-rd., 2 a. f. 350

151, Upper Park-st., 2 a. f. 600

By DOUGLAS YOUNG & CO.

Brixton—105, Brixton-rd., 2 a. f. 1,350

401, 108, & 131, 330

Walworth—13, Fleming-rd., 2 a. f. 150

Streatham—6, Kila-rd., 2 a. f. 310

108, & 131, 330

77, 79, 81, and 83, Lewin-rd., f. 1,680

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Bethnal Green—6 to 9, Manchester-bdgs., f. 1

37, Collingwood-st., 2 a. f. 230

Hackney—29, Dove-row, f. 1,500

68 and 70, Boston-st., f. 400

By SIMMONS & SONS.

Hambleton, Bucks.—Two enclosures of building land, 30 a. f. 1,100

Burrow Farm Estate, 178 a. f. 3,000

By R. & S. SMITH.

Higgate—7, Bishop-rd., 2 a. f. 75

100, 108, & 131, 330

Finchley—58, Lincoln-rd., 2 a. f. 420

By R. TIDY & SON.

Kingsland—23, Downham-rd., 2 a. f. 300

131, 108, & 131, 330

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Prize.	Designs to be delivered.
*Laying-out Park and Recreation Grounds.....	Widnes Jubilee Comm. Committee.....	35, 10, and 5 guineas.....	July 1
Public Hall, Fitchbury.....	W. S. Pinner, Esq., Solicitor, Fitchbury.....	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Public Baths, Glenogreen-road, Stockbridge.....	Edinburgh Corp.	R. Morham, City Chambers, Edinburgh.....	May 30
Steam Bakery.....	Bedlington Co. op Soc.	Booth & Hardy, Archt., Morpeth.....	.....
Kitchen and Ward Blocks at Hospital, Kelghley.....	.....	W. & S. Bailey, Archt., 1 Scott-st., Kelghley.....	.....
Metalling, Channelling, &c. Noel and Victoria-streets, Kilmarnock.....	Basford R.D.C.	G. W. Hawley, Surv. King street, No. 10, Kilmarnock.....	.....
Terrie Memorial Lifeboat House, Eastbourne.....	Royal National Lifeboat Institution.....	J. T. Skelton, 122, Terminals-road, Eastbourne.....	.....
Streets works, Shipton and Other Streets.....	York Corp.	A. Cress, City Engineer, Guildhall, York.....	.....
Villa, Mayne-road, Riccarton.....	.....	Raid & Wittel, Archt., 12, Victoria-st., Riccarton.....	.....
*Removal of Chimney.....	Edinburgh and Leith Gas Comrs.	W. & H. Herring, Gas Works, New street, Edinburgh.....	.....
Additions to Dwelling House, North Clerk, Croydon.....	.....	J. Black, Artistic Estate Office, Croydon.....	May 31
Additions and Repairs to Cottage, Kirkton, Ayr.....	.....	.....	.....
Additions to Farmstead, Mersley, Ayr.....	.....	.....	.....
Five Semi-detached Villas, Aberhan Mura Church, Hensay, near York.....	.....	W. Dowdall, Archt., Trebarnis.....	.....
Restoration of Bible Christian Chapel, Trillick.....	.....	C. E. Fowler, Archt. Durham.....	.....
Electricity Generating Station, Port Dundas.....	Glasgow Corp.	A. Miller, Archt. 143, West Regent-st., Glasgow.....	.....
Twelve Labourers' Cottages, Cabragh.....	North Dublin Union.....	J. O'Neill, North Brunswick-st., Dublin.....	June 1
Flints, &c. (1,100 tons).....	Burgess Hill U.D.C.	A. F. Hardwick, Council Office, Burgess Hill.....	.....
Eighty Villas.....	Newport (Mon.) Guild-ops Building Co. Ltd.....	A. M. Leon, Archt. 17, Park-st., Newport.....	.....
Schools, Cookstown, Ireland.....	.....	H. A. Mann, Archt. Cooke-st., Cookstown.....	.....
Enlargement of Church, Aberavon, Glamorgan.....	Hore T.C.	G. E. Halliday, Archt. 14, High-st., Cardiff.....	.....
Street Works, &c.....	.....	.....	.....
House and Stabling Aldwick.....	G. Crank.....	G. Beavell, Jun., Archt. Aldwick.....	.....
Additions to Schools, Vicerstown, Ireland.....	.....	G. F. Hyatt, Archt. 41, South Mall, Cork.....	.....
Foundry, Store, &c. Fenton-road, King Cross, Halifax.....	.....	T. L. Pate, Archt. 11, George-st., Halifax.....	.....
Two Houses, May-street, Watford, London.....	Misses Orr.....	T. Johnson, Archt. 11, East Wall, London.....	.....
Sewers, Southchurch-road.....	.....	.....	.....
*Five Stores at H. apital.....	Edinburgh U.D.C.	R. Collins, Council Offices, 10, Leith Road, Edinburgh.....	.....
Engine House, Lillingdon.....	Leamington Spa Corp.	A. P. Jones, Archt. 10, Leamington-st., Leamington.....	.....
Eighteen Houses, Aber, near Caerphilly.....	Fanter Building Club.....	W. H. Jones, Archt. 10, Caerphilly.....	.....
Campel, Carnarvon.....	The Trustees of Silth Chapel.....	E. L. Jones, Archt. 14, Chapel-st., Carnarvon.....	.....
Five Houses, Newry Faw, Holyhead.....	Byngton Building Estate.....	L. O. Williams, Archt. 70, Victoria-st., Liverpool.....	.....
*Asphalt Paving.....	St. George's-in-the-East Vestry.....	C. A. Archt. 10, East Wall, London.....	.....
*Mess Room, Offices, &c. Derby Station.....	.....	.....	.....
Coffee House, Assembly Hall, &c. Sowers, Treaslaw.....	Directors of Coffee House, L.A. Eversdon Rhonda U.D.C.	W. J. Jones, Surv. Council Office, Treaslaw.....	.....
Tower at Parish Church, Amsalong, co. Down.....	.....	.....	.....
Reservoir, Park Hill.....	Pontefract Corp.	G. H. Hill & Sons, Esq., Albert-st., Pontefract.....	.....
Additions to Engine House, &c. Rodi.....	.....	.....	.....
Mortuary, Mullingar District Lunatic Asylum.....	Board of Control.....	G. E. Shanahan, Custom House, Dublin.....	.....
Elx Cottages, Mullingar District Lunatic Asylum.....	.....	.....	.....
Infirmary.....	.....	.....	.....
Blocks at Workhouse.....	Bath Union.....	J. Sansom, Archt. Greenbank-lane, Bath.....	.....
Sewers, Shettleston, Lanark.....	.....	.....	.....
Road Making.....	Wimborne U.D.C.	C. M. Gorton, Surv. Council Office, Wimborne.....	.....
Houses, Lanchester.....	W. Cumming.....	W. R. Bell, Archt. Taylor-street, Lanchester.....	.....
*Additions to Laundry.....	Three Counties Asylum near H. Colton.....	G. T. Hign, 35, Parliament-street, B.W. ....	.....
Footbridge over N. L. Railway.....	Poplar District B.O.W.	L. Potts, 117, High-street, Poplar.....	.....
Telegraph Stores.....	The Directors of the N.E.R. Co.	C. N. Wilkinson, Telegraph Department, York.....	.....
Gas and Water Pipes.....	.....	.....	.....
Sewerage Works.....	Tring U.D.C.	A. W. Vaisey, Council Office, Tring.....	.....
Park Keeper's Lodge, Queen's Wood, Highgate.....	Hornsey U.D.C.	R. J. Lyvermore, Surv. Southwood-lane, Highgate.....	.....
Two Portable Bridges, Alexandra Wharf, co. Down.....	Belfast Harbour Comrs.	G. F. L. Giles, Harbour Board, Belfast.....	.....
Timber Jetty, & Tide-way, co. Down.....	.....	.....	.....
Restoration of Chapel of Church, Llangathen, Carmarthenshire.....	H. M. Commissioners of Works.....	S. W. Williams, Archt. Rhayader, Radnorshire.....	.....
Post Office, Weston-super-Mare.....	.....	.....	.....
*Road Materials.....	Malden U.D.C.	T. F. Bunting, Fairmeadow, Malden.....	.....
*Underground Conveyance.....	Poplar B. of W.	S. P. Jones, 117, High-street, Poplar.....	.....
*Footbridge over Railway.....	.....	.....	.....
*Granite, York Kerbing, &c. Bricks.....	St. Albans Corp.	City Surveyor.....	.....

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Culvert, near School Green, Freshwater (Contract No. 1).....	Isle of Wight R.D.C.	J. E. Haynes, Surv. Park-road, Cowes.....	June 2
Reconstruction of Bridge, near Fins Ins. Wellow (Contract 2).....	.....	.....	.....
Road Materials.....	.....	.....	.....
*Repairs to Tar and Asphalt Paving.....	Tottenham U.D.C.	A. H. Delamham, St. Albans.....	.....
Two semi-detached Houses, Coton, Leics.....	.....	.....	.....
*Mortuary.....	Hatfield R.D.C.	The Clerk.....	.....
Underground Conveyance, Burnside-street.....	Leeds Corp.	C. James, Comfort, Leeds.....	.....
Houses, Stable, &c. Trebost, Bithams, Cornwall.....	Committee.....	Meik & Sons, Esq., 21, York place, Edinburgh.....	.....
Concrete Sea Wall, Bournemouth, N.B. ....	.....	.....	.....
Road Making, Mitcham.....	Croydon Corp.	Borough Surveyor, Town Hall, Croydon.....	.....
Culvert, &c.....	Bingham (Nottingham) R.D.C.	C. Parnham, District Surv. Bingham.....	.....
*York Stone.....	.....	.....	.....
*Cleaning, Painting, and Repairing at Mole Drivings.....	St. James' Vestry, Westminster.....	Vestry Hall, Piccadilly, W. Surveyor, Vestry Hall.....	June 4
*Underground Conveyance, Kilburn School.....	Abchurch School Ed. ....	.....	.....
Residence, &c. Ecclehill, Yorks.....	.....	.....	.....
Paving Materials.....	Wigan Corp.	Borough Engineer, Wigan Town Hall, Wigan.....	June 13
Steel Bridge over R. Nar, Westacre-street.....	Norfolk C.C.	Norwich.....	.....
Flints, &c.....	Spaldon U.D.C.	E. R. Capon, Surv. Easton, Spaldon.....	June 14
Stores, &c.....	.....	.....	.....
Bewerage, &c. Alfred and other streets, Moulton.....	Scots Corp.	By high surveyor, Town Hall, Moulton.....	June 16
*Pumping Station and Sewers.....	Comrs. H. M. Works, Plymouth Corp.	J. Mansergh, 5, Victoria-street, Plymouth.....	June 17
*Asylum, Warrington.....	Ctr. Boro Croydon.....	Borough Engineer, Town Hall, Boro Croydon.....	June 20
Main Sewers, &c. Hale.....	.....	.....	.....
*Boulder Wall at Pumping Station.....	London County Council.....	Esqr. & Dept. Comm. Hall, Spring Gardens, S.W.	June 21
*Sewers, Manholes, &c.....	Asby, do-la-Zouch U.D.C.	J. B. Eversard, Millstone U.D.C.	June 25
*Superstructure of Asylum near Epsom.....	L.C.C. Asylums Com.	G. T. Hign, 35, Parliament-street, S.W.	June 27
*Erection of Buildings, Supply of Electric Machinery, Tram Cars, Plant, &c.....	St. Leonards Town Council (Cape).....	Dyer & Dyer, 17, Alder-street, St. Leonards.....	June 28
*Sewerage Disposal and Water Supply (Plan and Estimate for).....	Unalut U.D.C.	R. J. Platten, Clerk, Unalut, Victoria.....	July 3
Steel Pipes (240 miles), Loughgarra.....	Western Australian Government.....	Agent-General for Western Australia, 15, Victoria-street, London.....	Aug. 25
St. El Pipe (82 miles).....	.....	.....	.....
*New Buildings at Workhouse.....	.....	.....	.....
*Pulling down Mansion, Piccadilly.....	.....	.....	.....
Salvation Army Buildings, Junction-road, Highgate.....	.....	.....	.....
Chapel, &c. Lege-road, Rotherham Extension of Premises.....	The Trustees.....	W. Jackson, Springbank, Rotherham.....	.....
Refectory, &c. 56, Glenelg-street, Belfast.....	Wesleyan Trustees.....	G. & J. Byrne, Archt. 4, Waring-street, Belfast.....	.....
Two Houses, Bedford-street, Mansfield.....	.....	.....	.....
Levelling, Kerbing, &c. Lower John-street, Bradley Green, Biddulph.....	.....	.....	.....
Additions to Police Station, Stone.....	Staffordshire C.C.	T. H. Jones, Esq., County Surveyor, Staffst. - Thompson, Leek-st., Stone.....	.....
House and Shop, Elmsmere.....	.....	.....	.....
Re-windowing Church, Castlepollard.....	Rythgaffe Select Vestry.....	Rev. R. Smyth, The Parsonage, Castlepollard.....	.....
Cottages, Dunelm, near Lincoln.....	.....	.....	.....
Additions to Hall, Markeby-the-Sea.....	.....	.....	.....
Stores, Offices, &c. Stockton-on-Tees.....	T. W. Cameron & Co.	J. M. Bottomley, Archt. 46, Albion-street, Leeds.....	.....
Paints, &c. Portlough House, Barry, near Cardiff.....	J. Cory.....	Jones, Richards & Budge, Archt. 18, St. Mary's, Cardiff.....	.....
Drainage Works, Scots' Gap, near Eglwyske Wood.....	Alwicks R.D.C.	M. T. Wilson, C.E. Alwicks T. E. Davidson, Archt. 33, New-street, Warrington.....	.....
Church and Vestries, Dudley, North-underland.....	.....	.....	.....
Additions to Licensed Premises, Broad-street, Belfast.....	E. Smith.....	T. V. Brennan, Archt. 21, Waring-street, Belfast.....	.....
Schools, Leuton.....	Nottingham S.B.	A. N. Brunley, Archt. Queens-st., Nottingham.....	.....
Nine Houses, &c. Downing-street, Belfast.....	.....	Alexander & Reid, Archt. 103, Royal Avenue, Belfast.....	.....
House, Roundway, Leeds.....	.....	P. Robinson, Archt. 79, Albion-st., Leeds.....	.....
Eight Houses, Beadingley, near Leeds.....	.....	A. C. Smith, Esq., Archt. 26, Newwood-place, Huddersfield.....	.....
Chapel, Hornorton, Ashbourne.....	.....	H. Barber, Archt. Market-place, Nottingham.....	.....

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be in.
*Merchant's Instructors in Engineering and Woodwork.....	County Boro. West Hants.....	45s. per week respectively	June 1
*Clerk of Works.....	Harper Adams Foundation (C. R. Liddell, Clerk, Newport, Salop).....	32s. per week, and rooms if required.....	June 2
*District Surveyors (Two), North and South Fulham.....	London C.C.	Estimated 1,400s. and 870s.	June 9
*Assistant Inspector of Art Schools and Classes.....	London C.C.	300s. per annum.....	June 11
*Building Inspector.....	Basing U.D.C.	22 10s. per week.....	.....
*Clerk of Works.....	County Boro. Croydon.....	800s. per annum to com- mence.....	June 14
*City Engineer.....	City of Cape Town.....	.....	June 15

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, vii, & viii. Public Appointments, pp. xvi, xvii, & xix.

DALMAIN-ROAD junior mixed department, Forest Hill.—
Extending heating apparatus and providing boiler —
J. Frazer & Son £292 0 W. J. Cochrane £163 10
Comyn Ching & Co. 197 10 Russell & Co. 159 10
R. Harlow & Son 155 0 J. Naughton & Brown, Ltd. 158 10
Bates & Pearce 172 0 Berry, Campbell, & Co. 166 10
F. Mitson 170 0 Lewis Hill 93 0
* Recommended for acceptance.

FARNCOMBE STREET (Bermondsey).—Enclosing, &c., additional land, erecting new houses for schoolkeeper, &c. —
A. White & Co. £3,375 0 J. & C. Bowyer £3,375 0
O. Craske 3,557 0 E. Triggs 3,275 0
Lathley Bros. 3,486 0 J. Naughton & Brown, Ltd. 3,688 0
F. & H. F. Higgs 3,364 0 * Recommended for acceptance.

FAUNCE STREET, KENNINGTON PARK.—New entrance —
T. Freeman & Son £282 0 W. Downs £147 0
Star & Son 198 15 J. Marland 145 0
G. Brittain 197 0 E. B. Tucker 143 15
J. F. Ford * Recommended for acceptance.

FULHAM PALACE ROAD SITE.—For enlarging infants' iron building —
T. Cruxys £346 0 W. Harbrow £270 0
Croggen & Co., Ltd. 277 10 J. Mitson & Co. 198 0
Humphreys, Ltd. 240 0 * Recommended for acceptance.

GILL-STREET SCHOOL (Limehouse).—For additional heating —
Strong & Collings £72 0 Vaughan & Brown, Ltd. £52 0
W. Simmons 68 0 H. C. Price, Lea & Co. 49 0
J. C. & J. S. Ellis, Ltd. 59 0 Berry, Campbell & Co. 33 10
* Recommended for acceptance.

GROVE VALE SCHOOL (East Dulwich).—New school, to provide accommodation for 1,112 children, with a house for the school-keeper —
Leslie & Co., Ltd. £85,168 7 0 F. & H. F. Higgs £29,000 0 0
W. Downs 24,145 0 E. Lawrence 23,037 0 0
S. Hart 24,345 0 Sons 23,068 0 0
Edwards & Med. 24,241 0 L. H. & R. Roberts 24,741 0 0
way 24,116 0 G. E. Wallis 21,575 0 0
J. Carmichael 25,272 0 * Recommended for acceptance.

HASEL RIGGE ROAD SCHOOL (Clapham).—Improving ventilation of drains —
H. Somerford & Son £195 0 J. Curlett & Son £175 0
W. V. Goad 123 0 W. Hammond 99 0
Star & Son 115 0 E. Triggs 75 0
Rice & Son 109 0 * Recommended for acceptance.

LYHAM ROAD SCHOOL (Brixton).—Provision of a partition in the infants' department —
E. B. Tucker £78 9 J. F. Ford £208 15
Rice & Son * Recommended for acceptance.

MANSFIELD STREET SUNDAY SCHOOL (Borough-road).—Adaptation of hired premises for a temporary school —
H. Line £493 6 Rice & Son £463 15
Johnson & Co. * Recommended for acceptance.

MANSFORD STREET JUNIOR MIXED SCHOOL (Old Bethnal Green-road).—Overhauling heating apparatus, &c. —
J. Tison £245 0 H. C. Price, Lea & Co. £175 0
J. & F. May 215 0 W. C. Cannon & Sons 159 10
J. Wommer-Smith, Gray, & Co. 275 0 I. C. Christie 153 0
C. Davis 182 0 B. Field & Co. 122 0
* Recommended for acceptance.

MUNSTER ROAD SCHOOL (Fulham).—For providing stepped flooring, &c. —
Lathley Bros. £293 6 E. James & Son £27 5
H. Smith & Son 62 0 E. C. Munster 84 0
W. Hammond 89 10 W. R. & A. Hyde 69 5
* Recommended for acceptance.

NEW CASTLE STREET SCHOOL (Bethnal Green).—Enclosing strips of land in front of school —
J. Tison & Co. £2,375 0 Staines & Son £267 0
Grover & Son 258 0 D. Gibb & Co. 249 0
* Recommended for acceptance.

Supply of notice boards —
Each. Each.
W. H. Lascelles & Co. £20 15 0 J. H. W. Martin £20 9 0
E. Spencer & Co. 0 13 0 Rice & Son 0 10 0
G. M. Hammer & Co. 0 13 0 H. Addison & Co. 0 10 0
F. J. Cross 0 10 0 London School Furniture Co. 0 8 4
T. Cruxys * Recommended for acceptance.

C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT,
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, AND FIT FOR IMMEDIATE USE.
Telephone, No. 74 Holborn. Tele. Address: "SNEWIN, London."

"SHAFTESBURY" TRAINING SHIP.—For overhauling steam boilers, &c. —
Overhauling, Repairing, and Re-fitting Steam Boilers.
F. & R. Bone £150 0 J. Wommer-Smith, Gray, £145 0
W. G. Cannon & Sons 93 0 & Co. 145 0
Strong & Collings 114 0
Z. D. Berry & Sons £125 0 J. Wommer-Smith, Gray, £125 16
J. & F. May 158 0 & Co. 145 0
Stedde & Co. 144 0 W. G. Cannon & Sons 105 0
J. C. & J. S. Ellis, Ltd. 132 10 Benham & Son, Ltd. 98 0
Wenham & Waters 137 0 * Recommended for acceptance.

SUMMERFORD STREET SCHOOL (Bethnal Green).—For provision of wood block flooring in infants' hall —
W. Irwin £258 0 Johnson & Co. £163 0 0
T. Cruxys 159 0 Acme Wood Flooring 149 11 8
J. Grover & Son 174 0 0 Co., Ltd. 149 11 8
McCormick & Son * Recommended for acceptance.

SUMNER ROAD SCHOOL (Peckham).—Alterations to sinks &c. in laboratory —
H. Line £72 0 E. Triggs £70 0
Lathley Bros. 70 0 Heunemann & Brown 35 0
Star & Son * Recommended for acceptance.

WINCHESTER STREET, PENTONVILLE.—Drainage works —
G. Fosley £200 0 Marchant & Hirst £125 0
R. A. Verbury & Sons 171 0 Johnson & Co. 130 0
Cowley & Drake 145 0 Stevens Bros. 124 0
* Recommended for acceptance.

For the supply of art cases —
Rice & Son 1 6 each.
F. C. T. 15 4 0
H. Bonnard 7 0 0
E. Spencer & Co. 5 6 0
S. J. Waring & Sons 5 6 0
T. Cruxys 5 6 0
G. M. Hammer & Co. 5 6 0
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The Builder.

VOL. LXXIV. No. 289.

JUNE 4, 1898.

ILLUSTRATIONS.

Jardine Hall, Dumfries. As Enlarged and Remodelled.—Mr. E. J. May, Architect:—

Entrance Front	Double-Page Ink-Photo.
Dining-Room	Double-Page Ink-Photo.
Principal Staircase	Single-Page Ink-Photo.
Entrance Stairs	Single-Page Ink-Photo.
Entrance Vestibule	Single-Page Ink-Photo.
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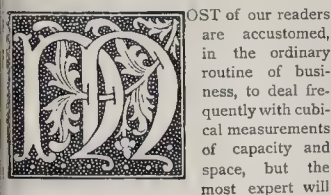
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The Gas Industry.



MOST of our readers are accustomed, in the ordinary routine of business, to deal frequently with cubical measurements of capacity and space, but the most expert will experience difficulty in grasping an accurate conception of the space occupied by 34,000 million cubic feet; a measurement which corresponds approximately with the total volume of gas manufactured in one year by the three London gas companies. To produce this stupendous quantity of gas about 3½ million tons of coal are carbonised, one ton of coal yielding a little more than 10,000 cubic feet of gas; in addition, a large quantity of oil has, of late years, been used for enrichment purposes.

A cubic foot of gas on combustion yields approximately half a cubic foot of carbon dioxide, and an adult person exhales 0.6 of a cubic foot of carbon dioxide per hour; consequently London's gas consumption produces about 17,000 million cubic feet of carbon dioxide per annum, which exceeds considerably the amount of carbon dioxide exhaled in a year by a population of three million adult persons. The production of this carbon dioxide, in addition to the vast quantity yielded by the coal and coke consumed for domestic and manufacturing purposes, together with that exhaled by the animal population, is of itself sufficient to account for the rapid decay of soft limestones in the moist atmosphere of London; for, notwithstanding the effect of wind and diffusion, much of the carbon dioxide dissolves in the frequent rains and water-saturated fogs, and forms a solution in which the calcareous stone is soluble.

The amount of sulphurous acid produced by the combustion of gas during the year is also very considerable, although it is but trifling when compared with that evolved from the coal burned by householders and manufacturers.

At the commencement of the present century the gas industry was in its infancy, or little more than a hundred years have elapsed since Murdoch, the founder of the

industry in this country, first lighted his Cornish home with coal gas. At the present date, almost every town of importance in Europe, America and Australasia has its gas works, and those erected in Asia and Africa are neither few nor insignificant. In this country coal has been almost the sole source of gas up to the present time, but the use of oil and water gas has been steadily becoming more general for many years past, while petroleum spirit has also been largely adopted for enriching the gas obtained from ordinary gas coal. Formerly, cannel coal, which yields a gas of greater illuminating power than the bituminous coal, was almost universally used for enriching purposes, but the increasing scarcity and price of cannel induced gas manufacturers to introduce other enrichers, and when a carburetted water gas plant has been adopted, the gas manager seldom forsakes it.

The item, 1,648 million cubic feet of "oil gas," in last year's annual report of the London Gas Light and Coke Company, is an indication of the increasing production of gas other than coal gas, while the recent appointment of a Departmental Committee by the Home Office to enquire into the use and properties of water gas, is evidence that the supply of this description of gas has become sufficiently large to require Government attention. Carburetted water gas has been used for a long time in the United States of America, but it has not been satisfactorily proved that its use has caused more fatalities than would have occurred with coal gas. The notice, "Please do not blow out the gas," which is sometimes seen in American hotels, is quite as necessary where coal gas is supplied as with water gas; and that the notice is not altogether unnecessary in England is shown by the recent tragedy in Liverpool, where a Norwegian, apparently through ignorance, and not with suicidal intentions, blew out a gas flame from a burner passing about seven feet of gas per hour, and was found dead the next morning.

When petroleum spirit is used for carburetted coal gas, it is usual to allow the gas after purification to come into contact with a slow stream of the spirit; a portion of the spirit then vaporises, mixes with the coal gas, and thereby enriches it.

The process of coal gas purification usually adopted in the larger works is carried on in the following stages. When the gas is

driven off from the heated coal in the retorts it is, of course, at a high temperature, but it passes at once through the ascension pipes to the hydraulic main, where much of the tar and water vapour condenses. The gas next passes through the condensers, where it is cooled in order to condense out the remaining tar and other condensable matter; then it passes through washers and scrubbers, where it is washed with water and parts with most of its ammonia, and the remaining particles of tar, in addition to a considerable amount of sulphuretted hydrogen and carbonic acid. From the scrubbers the gas proceeds to the purifiers, where practically the whole of the carbonic acid and most of the sulphur compounds are removed. Finally, it is passed into the unsightly gas-holder, and is ready for distribution in the district.

The foregoing represents the most commonly adopted method of procedure, and it will be seen that the gas is subjected to a very rigorous cleansing before it is allowed to appear in the district. In the early days of gas-making, the carbonic acid was often allowed to remain in the gas, and greatly diminished its illuminating value; the sulphur compounds remained, and rendered the gas more objectionable for indoor use, and the valuable ammoniacal liquor was run to waste, while the value of the tar was by no means fully appreciated. At the present time, stringent regulations exist in most towns as to the purification and illuminating power of the gas.* Most of the sulphur is abstracted and used for making sulphuric acid, the ammoniacal liquor is utilised in the manufacture of sulphate of ammonia, and upon the tar the extensive aniline dye industry mainly depends.

Great as the improvement in the quality of the gas supplied to consumers has been, the success of the industry has probably been more dependent upon the advance which has been made in the methods of the utilisation of gas. Some years ago a lighting power equivalent to three and a half candles per cubic foot of gas was considered a satisfactory yield, then a great advance was made by the introduction of the regenerative burner giving an equivalent of ten candles per cubic foot, and now, with the aid of the incandescent mantle, fifteen candles per

* See "London Gas, its Supply and Quality," vol. xxiv., p. 293.

cubic foot is not an uncommon yield. More remarkable is the new burner for incandescent lighting which is about to be placed on the market by the Welsbach Company, and which they claim will give from 25 to 30 candles per cubic foot of gas.

It is a peculiarity of modern times that the demand for more artificial light has steadily increased, and although the lighting of both streets and dwellings has continually improved during the present century, yet the demand shows no indication of abatement. As a matter of fact, a gas consumer who adopts a burner which gives double the lighting value, but consumes only the same quantity of gas as the discarded burner, usually takes advantage of the increased light in preference to reducing the gas bill, and the ever-increasing brilliancy of shop lighting is evidence that effective lighting is an attraction to customers.

Many readers will probably remember the time when the popular opinion was that the electric light and cheap oil would push the gas industry almost out of existence in civilised towns, but time has shown that there is room in the market for gas as well as for its rivals, for notwithstanding the constantly growing length of electric lighting wires in all directions, and a huge consumption of oil, the output of gas all over the kingdom continues to increase. Owing, no doubt, to the introduction of the incandescent light, the penny-in-the-slot meter, and especially to popular gas-heating and cooking appliances, gas was never more largely used than at present, and whether it be manufactured from coal, oil, oil and steam, and steam, or other materials, it is more than probable that the gas industry will continue to flourish, in spite of the growth of its rival industries, for many generations to come. No review of the gas industry as it exists in the present year would be complete without mention of acetylene, the latest gaseous illuminant, which has attracted universal attention, and has already been adopted in some few places for public lighting. All important particulars relating to this gas have, however, been recorded in previous issues,* and no further reference to it is therefore necessary at present.

ART AND ARCHITECTURE IN THE CASTLE HOWARD MANUSCRIPTS.

EVERY ONE knows how many art treasures there are in the great houses of England, but it is only within the last few years, in consequence of the publications of the Historical Manuscripts Commission, that the wealth of literary and historical material in these same mansions has become known. One of the most recent and one of the most important of these publications is the volume in which are printed a large number of the manuscripts which have been preserved at Castle Howard, the home for many years of the Earls of Carlisle. Some of these give us glimpses of men famous in the art and architecture of England, of Reynolds and Vanbrugh; others describe the state, the character, and the construction of some of the most notable houses in England. It will, we think, be of interest and value to print some of these materials, for it is impossible for any

one but a historical student to push his way through this huge and badly-printed volume. In order of time we come first in contact with Sir John Vanbrugh, a man famous not only as an architect, but of much versatility, a play writer, and a close observer of all contemporary events. Most of the letters printed in this volume touch on social and political events, and it is a matter of regret that the editor has not thought fit to include more of Vanbrugh's which refer to the building of Blenheim and to his lawsuit with the Duke of Marlborough. A note informs us also that "other letters treat of architectural matters in reference to Castle Howard and other edifices." That letters on such subjects should be omitted by the Commission is highly characteristic of this country, in which anything relating to art is supposed to be of little or no interest; but we must protest against the non-publication of such letters, for these reports are intended to place within the reach of students of every kind the materials which would otherwise be inaccessible to them.

It was in June, 1722, that the death of the Duke of Marlborough took place, and Vanbrugh wrote a long letter to Lord Carlisle giving various particulars of his fortune. He concludes as follows:—

"Sure, if ever any such thing as erecting monuments in open places was right, it would be so in this case. But I fancy the Duchess will prevent him laying near her, though it would not make her very melancholy neither.

"The place I propose is in Blenheim Park, with some plain but magnificent and durable monument over him." (Page 41.)

A week later Vanbrugh writes again on the same subject, with some very sensible remarks on the folly of gorgeous funerals:—

"1722, July 19, London.—I believe my Lord Godolphin would have liked very well to have had the Duke of Marlborough buried in the Park, with a very good monument over him; but the Duke directs in his will that they should bury him in the chapel at Blenheim. Here is a pompous funeral preparing, but curbed and crippled by her Grace, who will govern it by her fancies, amongst which there is but one good one, and that is, that she'll pay for it. I don't know whether it won't cost her ten thousand pounds. What a noble monument would that have made, whereas this idle show will be gone in half an hour and forgot in two days. The other would have been a show, and a noble one, to many future ages." (Page 41.)

At a later period in this correspondence, in the time of the fifth Earl of Carlisle, who was a lover of art and of literature, we see something of Reynolds. He painted a portrait of Lord Carlisle. The latter, through the financial difficulties in which he was placed by the resistance he gave to Charles Fox, was for a long time pressed for money. But it does not seem as if Reynolds were an importunate creditor. George Selwyn, who knew him well, writes to his young friend, to whom he was a sound and sincere adviser, about this debt:—

"The debt to Sir Jos[hua] Reynolds does not weigh much on me; we know that it was contracted long ago, and as to appearances I think they are better saved by the pictures being in your own house than in his. He seems a good natured man. You know that *cette qualité je l'ai mise à l'épreuve*. He must be sure of his money, and cannot want it immediately; he knows also that your affairs are *dérangées pour le moment*. I hope that if he puts any false colours on your conduct towards him, that they will be like all his other colours, of a very short duration. But I think that he will not. Therefore, my dear Lord, do not represent to yourself things more disagreeable than they really are. You ask, if he had any orders to finish these pictures? None

that I know of, but perhaps that he took that for granted." (Page 206.)

Among the letters of the Early Georgian period are several from Sir Thomas Robinson, of Rokeby Park, who held several important offices during his lifetime. These documents contain descriptions of some noticeable country seats in 1731; more especially Houghton in Norfolk, the home of Sir Robert Walpole. Here is an extract from the letter in which he writes of this place:—

"I believe it is the best house in the world for its size, capable of the greatest reception for company, and the most convenient state apartments, very noble, especially the hall and saloon. The finishing of the inside is, I think, a pattern for all great houses that may hereafter be built; the vast quantity of mahogany, all the doors, window-shutters, best staircase, &c., being entirely of that wood; the finest chimneys of statuary and other fine marbles; the ceilings in the modern taste, by Italians, painted by Mr. Kent, and finely gilt; the furniture of the richest tapestry, &c. the pictures hung on Genoa velvet and damask; (this one article is the price of a good house, for in one drawing-room there are to the value of 3,000*l.*; in short, the whole expense of this place must be a prodigious sum, and, I think, all done in a fine taste. There is only one dining-room to be finished, which is to be lined with marble, and will be a noble work. The offices are also built of Mr. Chalmers's stone, and are well disposed and suitable to the house. In one wing are the kitchens and all necessary rooms belonging to a table, servants' halls, &c., and over head are several very good lodging rooms; in the other are the brewhouse and washhouse, &c., and a very magnificent hall for a chapel, and a large room which looks on the parterre, designed for a gallery, there being the same in the opposite wing for a greenhouse.

The enclosure of the Park contains 700 acres, very finely planted, and the ground laid out to the greatest advantage. The gardens are about forty acres, which are only fenced from the park by a *fossé*, and I think very prettily disposed. Sir Robert and Bridgeman showed me the large design for the plantations in the country, which is the present undertaking; they are to be plumps and avenues to go quite round the park pale, and to make straight and oblique lines of a mile or two in length, as the situation of the country admits of. This design will be about twelve miles in circumference, and nature has disposed of the country so as these plantations will have a very noble and fine effect; and at every angle there are to be obelisks, or some other building. In short, the outworks at Houghton will be 200 years hence what those at Castle Howard are now, for he has very little full-grown timber, and not a drop of water for ornament; but take all together, it is a seat so perfectly magnificent and agreeable, that I think nothing but envy itself can find fault because there is no more of the one, and I scarce missed the entire want of the other." (Page 85.)

After Houghton, Sir Thomas goes to Euston and Ickworth. How, in the days of a successor of the Lord Bristol who then owned the latter property, it became the home of many art treasures, is well known. When Robinson wrote of it the present mansion did not exist.

"I was two days at the Duke of Grafton's, at Euston. The house was built by his mother's father, and, though of so short a standing, is ready to fall, being so very slightly finished, and all the materials so very bad. The garden of about eighty acres is fenced on one side from the park by a brick wall in a *fossé*, as at Sir Robert's, and the slope from the terras in the garden so wide, that the wall is plante[d] with fruit trees, and so disposed that they have a sufficient quantity of sun to ripen their respective fruits. On the other side the fence, between the garden and the park, is a very pretty rivulet cut in a winding and irregular manner, with now and then a little lake, &c., and over it in one approach to the house is a wooden bridge built by Lord Burlington, with an arch that appears almost flat, and from hence you have a beautiful prospect of the water

* Vol. lxxiv., pp. 252 and 293.

which is indeed delightfully disposed. The park is about nine miles about. The Duke has hitherto done very little to it, but is now entering into a taste, but there has done so much for him, and his woods and lawns are disposed in so agreeable a manner, that a little art and expense will make it most charming. He has a wood out of the park something like Pretty-wood at Castle H[oward], which might make a noble thing.

In my way home, I spent a day with Lord Bristol at Ickworth, which is by much the finest park I ever yet saw, being about 1,200 acres, and above a cool of exceeding fine oaks, &c. Within the park, the disposition of the woods, lawns [and] meadows (where for a small expense he might have a quantity of water), and the rising hills covered with large old timber, are all truly magnificent and desirable. They live in a tenant's old house in the park, so very bad a habitation, that I am astonished how so large a family have so long made a shift in it.

The old mansion-house was pulled down about twenty years ago, and those materials and others sufficient to build a new house were led to another situation, and the new one determined to be built; and an ill run at play (as fame reports) stopped the design, and most of the wood, brick, and stone have been used in tenants' houses. His Lordship has been at very little expense, but nature has been much his friend that little assistance is wanting in art." Page 87.

In 1734 Sir Thomas describes another series of visits, one of them being to Wentworth, the seat of the FitzWilliams.

If in some things Lord Strafford's fell short of what I was told of it, I was very agreeably surprised finding this place improved in all respects since it was last here infinitely beyond my expectations. That may properly be called the house is about the same length in front as Lord Tilney's (260 ft.); that towards the garden is entirely finished, being only patch-work of the old house and partly a new building, and excepting a very fine library, little can be said in its praise, but when you come to the court, it amends will be sufficiently made to all lovers of architecture, and when finished 'twill be a stupendous fabric, infinitely superior to anything we have in England; the front of the house and offices (exclusive of the stables) being a line of 605 ft. built of the most beautiful hewn stone and the best masonry I ever saw; these offices on each side the house are entirely finished. The upright of the house will be in the same style as Lord Tilney's, by this portico will have eight columns in front.

The hall will be 64 ft. by 53 ft. deep, and 48 ft. high, a prodigious room; on each side of it are three rooms, all six 24 ft. high; two of them will be 36 ft. square, two 26 ft. in front and 38 ft. deep, and two 11 ft. in front and 36 ft. deep. This whole front will contain twenty-one windows, five of which are now covered in. The whole finishing will be entirely omitted to Lord Burlington, and I know of no subject's house in Europe [which] will have seven such magnificent rooms so finely proportioned as these will be. This part of the house will be built entirely new from the foundations, and very conveniently disposed to lay it to the old house; and as Lord Tilney's has hitherto been thought so fine a house, as some people imagined would never have been excelled, I am very glad for the honour of Berkshire to see a pile going forward here that will every respect infinitely exceed it. The outworks are also large, and my lord has a very fine command of wood and water; but none of the finishing strokes which give the beauty to the whole are yet completed.

As it is impossible in one place or country to have everything, I must now acquaint your Lordship, if the axle-trees of your coach are not very strong, you will find it difficult to get thro' the country, the roads being intolerable, by the vast number of ironstone pits, coal pits, and woods in the country. I have never yet been out, but I have met carts and waggon overthrown, for there have been such plentiful rains of late in this country, that the roads are almost as bad as in winter.

After saying so much of this place, I can't finish my letter without speaking something of the master and mistress of it, who really live as happily together, as easy to those with them, and with such hospitality to their neighbours and goodness to their children and servants as in any house I ever saw in. I never spent six days more agreeably, and

am sorry to be obliged to leave them so soon. When I reflect how soon your Lordship will be here, I beg pardon for taking up so much of your time; I desire my compliments to the ladies and Colonel Howard.

P.S.—The kitchen offices here are particularly worth seeing, and are very noble; and I would recommend the apartments for the poultry to Lady Irwin's observation, where she will find great variety of the feathered species, all magnificently lodged, and well attended on." Page 136.

If we come nearer London, and take a later period, we have an interesting account of the Duke of Queensbury's villa at Richmond. He was one of the most prominent figures in the society of his day. George Selwyn, writing in February, 1782, says that he is "laying out immense sums upon his house at Richmond. It will be an expensive villa to him with all its circumstances." In 1786 we again hear of this house. This time, however, Selwyn gives a description of part of it.

"The Duke [of Queensberry] dines with me when he is here, a little after four, and when we have drunk our wine we resort to his great hall, *bien éclairé, bien chauffé*, to drink our coffee, and hear Quintettes. The hall is hung around with the Vandike pictures (as they are called), and they have a good effect. But I wish that there had been another room or gallery for them, that the hall might have been without any other ornament but its own proportions. The rest of the pictures are hanging up in the Gilt Room, and some in a room on the left hand as you go to that apartment. The judges hang in the semi-circular passage, which makes one think that, instead of going into a nobleman's house, you are in Sergeant's Inn.

There is, and will be, a variety of opinions how these portraits should be placed, and with what correspondence. I have my own, about that and many other things, which I shall keep to myself."—P. 646.

Richmond of the present day, so respectable and so monotonous as regards its houses and their inhabitants, can scarcely be recognised in this little sketch, in which we see two men of society and of political influence spending their evenings in what was then, perhaps, the most fashionable spot near London.

Of this characteristic of the place we have a more vivid glimpse in a letter written by Selwyn in 1790. We give it because it brings back a state of society in connexion with Richmond which must add to the interest of the place in the present day.

"For Richmond news, *les voici*. Snow had his concert at the Castle the night before last, and when it was over a string of his harpsicord burst, for the poor man was arrested. Mr. and Mrs. Darrell, on the Hill, are cousins to the Darrells of the Vale. They live in the house that was built for the Duke of Ancaster. They are very good kind of people; they have an *assemblée* and a bread and butter ball once a week, on a Friday. It begins soon after seven, and ends soon after eleven; French and English, old and young.

The Duke is here; he dines with me every day, and seems more and more delighted with Richmond. We went together last night, and sat an hour at Lady Di's with Mr. and Mrs. Boverie. Lord Robert was there, who does not want a relish for rural amusements. Peg Jeffries *en est peu édifiée*, she keeps at home as if there was a plague in one part of the town, not knowing how free she herself is from infection." p. 692.

The fact is that Selwyn communicated the news of Richmond to his country friends very much as one might now write from Switzerland or Nice to friends in Cumberland or Yorkshire. Fashionable society then gathered on the hill above the Thames as it does at the end of the nineteenth century on the shores of the Italian lakes and of the Mediterranean.

NOTES.

The Temple
of Apollo
at Phigalia.

DR. SAUER, whose name is familiar to English students of archaeology from his able work on the attachment marks of the pediments of the Parthenon, has lately turned his attention to the metopes of the Temple of Apollo at Phigalia. These metopes are, unfortunately, in a very mutilated condition, but Dr. Sauer has succeeded, he thinks, in establishing the following points. The metopes were decorated with sculpture at the ends only, not at the sides (this, in fact, would seem to have been rather the rule than the exception). They were twelve in number, and stood not outside the exterior colonnade, as is the case with the Parthenon, but on the interior porticos of the *prodomos* and *opisthodomos*. Those decorating the south side are mutilated beyond recognition. The six on the north side fall into two groups, three dealing with Zeus, three with Apollo. The subjects represented are Zeus as an infant watched over by two nymphs, one playing on the crotala, the other on cymbals; the story of Cronos and Rhea, a very rare subject in ancient art; and Zeus and Hera. The Apollo subjects are less clearly made out, but on one of them Orpheus is represented. It is to be regretted that the papers in which Dr. Sauer deals with this subject appear in two different periodicals. He begins in the *Berichte of the Sächsische Gesellschaft d. Wissenschaften* at Leipzig, and ends in the *Athenian Mittheilungen* xxi., 333.

A SOCIETY has been formed, under the title of "The London Topographical Society," the

object of which is the publication of a complete set of London maps, views, and plans in facsimile, so that every period and every change of importance may receive illustration in the issues of the Society. The state of localities and districts at various periods will also be illustrated by the reproduction of parish maps, tithe maps, surveying plans, &c. A uniform size of paper will be adopted, large maps being divided and small ones printed with large margins, and every one dated, so that all may be arranged in portfolios in chronological order. The Topographical Society which was formed in London in 1880 has been merged in this new society, and its publications acquired; viz.: reproductions of Van den Wyngaerde's View of London, Hoefnagel's Plan of London, and Visscher's View of London. As new publications for the present year the London Topographical Society propose Porter's View of London (1660), Norden's Map of London (1593) and Norden's Map of Westminster (1593). Among the committee are Lord Welby, Mr. Edwin Freshfield, Mr. Laurence Gomme, Mr. Hilton Price, Sir Walter Besant, Mr. H. B. Wheatley, and others. The Hon. Secretary is Mr. T. Fairman Ordish, and the offices of the Society are at Warwick House, 8 Warwick-court, Grays Inn. Such a scheme ought to be of the greatest interest to residents in London, and indeed to Englishmen generally, and we hope the Society will meet with such support as will enable it to carry through its intentions, and provide a complete and connected illustration of the topographical history of the capital.

Relics of Old Paris.

THE excavations in progress for some months back, on the left bank of the Seine, for the prolongation of the Orleans railway to the Quai d'Orsay, have been tolerably fertile in antiquarian finds. At the entry of the Rue des Ecoles one of the piers has been discovered of the ancient Porte Saint-Victor, which formed part of the fortification wall of Philippe Auguste, and a portion of the wall itself has also been discovered, besides a specimen of an ancient cannon of primitive form. Towards Rue Lagrange, a little further on, a subterranean vaulted passage has been brought to light, formerly connected with the old Hôtel Dieu; and, near Rue de la Harpe, some remains of sculpture, pottery, and coins. Most of these objects have been placed in the Carnavalet Museum.

Westminster Building Accident.

WE learn from the architect to the London County Council that the sketch plan which we gave of the portion of Abbey Mansions which fell, in our last week's issue, is not correct as to the position of the pier, which was ultimately built at right angles to and not parallel with the external wall of the building, following the line of the 18 in. cross wall in the basement. We are not responsible for the error; we applied to the coroner for an inspection of the plan of the building, and the set of working drawings from which we made our sketch was brought to our representative by the assessor, and we were therefore entitled to conclude that it was what we had asked for. The difference, however, is only a matter of detail; in either case it is a pier of a certain size standing alone, without adequate support in proportion to the height to which it was carried, and that is the main point. We may observe, in reference to the inquest, that we believe this is the first occasion on which a coroner sitting in inquiry on a building fatality has been assisted by a professional assessor. It is a precedent which may well be followed in future cases of the same kind.

The Site of the Cripple Gate Fire.

AFTER some six months of negotiations, we now hear that there will be practically no street improvements whatever on the area of the Cripple Gate site. At the instance of the local Ward Committee, the Corporation had, though somewhat late, taken steps in respect to a proposed re-arrangement of the thoroughfares on the area affected; but owing to the County Council having declined to contribute to the cost of these improvements (which were estimated approximately at 600,000*l.*), the Corporation, at its recent meeting at the Guildhall, finally determined to drop the matter. We do not propose to examine the reasons why the County Council refused to participate in the improvement scheme, but we certainly consider that it is rather a disgrace to a metropolis like London to have about four acres of property burnt down without one of the main causes of the conflagration, that is, the narrowness of the thoroughfares, being remedied. As a matter of fact, we believe that neither the Ward Committee, the Corporation, nor the County Council really approached the subject seriously, and that influence was even brought to bear on the former bodies by those primarily interested in having the *status quo* maintained for their business

premises, with the view of obtaining a "do-nothing" report. Unfortunately, also, the Building Act itself gives no powers for making any material improvement in the construction of the buildings on the area. As far as regulations are concerned, Cripple Gate might be practically built over as it stood, as was the case with St. Mary Axe, after the great fire of 1893. Fortunately, however, the district has a popular and energetic District Surveyor, whose advice receives due consideration from most of those affected, and under his influence there will probably be an improvement in the class of building in the locality, but that is all.

Lifts at the Law Courts.

It appears that the Chief Commissioner of Works is really, after many years' delay, considering whether he should not place lifts in the Courts of Justice. These have long been a necessity: no public building of the same size and importance in a European capital would be without them, and we cannot see why there should be any further delay in the matter. They are needed, and they should be constructed. But it shows how behind the age our public officials frequently are, when it is only by Parliamentary action, and other outside pressure, that necessary works such as these can even be taken into consideration. Perhaps, while the minds of the Board of Works officials are directed to the Law Courts, they will also give attention to the warming and lighting of the offices, which is about as bad as it can be.

Guide Posts on Highways.

THE present time—just the beginning of summer—when strangers begin to spread themselves over England, appears suitable to call the attention of County and Rural District Councils to the need for a still larger supply of guide posts on highways within their jurisdiction. The highway authorities differ much on this point. In some counties highways are well supplied, in others the wayfarer is often left without directions at spots where they are much needed. There should be more system in this matter. Direction posts in the country are nearly as necessary as street names in towns. Therefore, every County and Rural District Council should make it a general rule to place guide posts wherever roads meet or branch off. Indeed, we would go further and say that this should not be left to the discretion of these authorities; they should be obliged to do so by a section of the Highways Acts, which it is time were consolidated into one statute.

Health Exhibition Dublin.

WE have received the programme of a Health Exhibition which is to be held in Dublin from August 18 to August 27, in the buildings and grounds of the University, in connexion with the Hygienic Congress to be held in Dublin at the same time. The exhibits will be classed under the following heads:—science; public hygiene; domestic hygiene; water supply; sewage treatment and disposal; drainage and plumbing; heating lighting and ventilating appliances; personal hygiene; electrical installations and appliances; disinfection; locomotion; and miscellaneous. No important exhibition of this kind has been held in Dublin for fourteen years, during which time a great deal of progress has been made in sanitary

science and practice, and the Exhibition Committee earnestly invite exhibitors to put forward only the best modern appliances, so as to make the exhibition representative of the state of sanitary science and practice at the present time. Applications for space should be made as early as possible before July 15, to Mr. G. M. Ross, Hon. Secretary, Health Exhibition Committee, 61 Dawson-street, Dublin.

Sewage- Purification.

WE have received a small pamphlet on "The Present Position of the Sewage-Purification Problem" from Mr. H. Gilbert Whyatt A.M.Inst.C.E., the Deputy Borough Engineer of Salford. The matter it contains was delivered as a lecture before the Lancashire and Cheshire Branch of the Sanitary Inspectors' Association on February 12, 1898, and it can be recommended as a clear, concise, and accurate survey of the recently-ascertained principles of sewage-purification. More might with advantage have been said about the filter designed by Col. Ducat, as it contains features which do not appear in any others; the features referred to (of which the author makes no mention) are the chamber for warming the air supplied to the filter in winter, and the open drain-pipes forming the sides of the filter and laid sloping inwards so that the sewage does not escape, although air is freely admitted. The lecture was also an appeal against the "agnostic immobility" of the Local Government Board with regard to bacterial systems of sewage-purification, but Mr. Whyatt will doubtless be the first to acknowledge that the appointment of Commissioners by the L.G.B. for the purpose of investigating these very systems, although *post hoc*, is not *propter hoc*.

Electric Railway Motors.

THE paper read by Professor Carus-Wilson last week to the Institution of Electrical Engineers on the design of electric railway motors for rapid acceleration was a particularly able contribution to electro-dynamics. It seems probable that this science will in the near future assume the same relation to the theory of the electric motor that the science of thermo-dynamics already bears to the steam-engine. The method of treatment adopted by the author was very similar to that which he has already given in his recent Cantor Lectures at the Society of Arts. The novelty of his methods rather took away from the interest of the discussion, as speakers had not had time to thoroughly weigh the somewhat radical innovations that the author is introducing into the theory of the subject, and his excellent book was only published a week or two ago. As Professor Carus-Wilson has lived for several years in Canada, and naturally is familiar with the everyday working of electric railways, he rather assumed more knowledge on the part of his audience than perhaps was justified. He was taken to task by some of the speakers for his nomenclature, for neglecting air friction, for not saying what effect roller bearings would have on the friction, &c. The objections rather show the soundness of his paper, as he had to be criticised on side issues. Professor Perry regretted that so few experimental data on the subject were published, and rather inferred that the author ought

* Printed for the author, from whom it may be obtained.

to have given actual results to illustrate and verify his solutions. The author, however, as solved the main problem in a very satisfactory manner, and recent experimental results on an English railway agree very closely with his solution.

Institution of Civil Engineers.
The annual Conversation of the Institution of Civil Engineers took place on the evenings of Thursday and Friday last week, and, as usual on such occasions, the capacity of the building in Great George-street was tested to its utmost limits. The guests were received by the President, Mr. W. H. Preece, and Miss Preece, and were treated to various kinds of scientific recreation, thoughtfully filleted with excellent music. During each evening Professor Turner exhibited a number of views illustrating the last solar eclipse. Captain Abney explained Dr. Joly's process of photography in natural colours; and short lectures were given from time to time by Mr. J. Gavey on wireless telegraphy. A large collection of engineering models and scientific apparatus was on view in the library and reading-rooms, while other parts of the building were given up to the phonograph, cooking by electricity, and such matters. By far the most portentous exhibit as far as apparatus is concerned was Mr. A. S. E. Ackermann's surface tension boat, a little paper vessel which is propelled by means of spirit of wine being allowed to leak from the stern, the action of the spirit being to reduce the surface tension of the water behind the boat. Altogether the conversation was a great success, and the guests must all have had very enjoyable evenings.

Oxford-mansions, Oxford-street.
This block of residential flats is offered for sale by tender. It contains a total floor space of about 54,700 ft. superficial, and has four frontages of 100 ft. each. The block was built for Mr. Cripps, after the designs and plans of Mr. Augustus E. Hughes, in 1880-1, upon the site of Oxford Market (pulled down in 1880), which was built in 1720-1 for Edward Harley, second Earl of Oxford and Mortimer, but was not opened until 1732, as Allen says in his "London;" on the vane were the figures "1721." In his edition of 1754 of Stow, Strype mentions that the market is "not much resorted to at present," and, so far as our recollection serves, it was but little frequented. Harley had acquired the property on marrying, in 1713, Henrietta, only child of John Holles, Duke of Newcastle; their only daughter and heir, Margaret, brought it in marriage—1734—to William, second Duke of Portland and Marquis of Titchfield.

Christ Church, Spitalfields.
It is proposed to erect an open-air pulpit in the graveyard, and a tablet within the church, as a memorial to the late Dr. Billing, Bishop of Bedford, and formerly rector, during ten years, of the parish. Similar pulpits have been recently erected at Trinity Church, Marylebone, in memory of Prebendary Cadman (1892), and at St. Mary Matelton, Whitechapel, as a memorial to Dean Champneys, who was rector for twenty-three years. In the latter instance the church, designed by the late E. C. Aytton-Lee, was burnt on August 26, 1880, and rebuilt by him. The Billing memorial recalls

the memory of the famous pulpit-cross which stood in the churchyard (since Spital-square) of the Priory Hospital, founded in 1197 by Walter Brune and his wife Rohesia, which they dedicated to Christ and the Virgin Mary. The district's old name was Lolesworth, the dedication of the priory survives in the name of the parish for which was built, in 1714-29, at a cost of 60,000*l.*, the church by Hawksmoor; the fabric was decorated and repaired in 1866, at a cost of nearly 7,000*l.*, by the late Ewan Christian. The pulpit-cross, rebuilt in 1594, was pulled down during the Civil War. The Spital sermons, which the Bluecoat boys used to attend there, were after the Restoration revived at St. Bride's, Fleet-street; in 1797 they were transferred to Christ Church, Newgate-street.

Art Metal Exhibition.
The Art Metal Exhibition, opened this week at the Royal Aquarium, appears to contain some very good work, and we shall give an article and some illustrations in our next issue. It is a great pity that it should be placed amid such incongruous and uninviting surroundings; it would have been much more likely to be a success in some better chosen locality.

ARCHITECTS' DUTIES: A FRENCH OFFICIAL STATEMENT.

The annual calendar, or *Annuaire*, of the "Société Centrale des Architectes Français," for the present year, contains a report as to the professional duties of an architect towards himself and his professional brethren, towards his clients, and towards the contractors, which, as a formal profession of faith on the subject, is of some interest. It is signed by M. Guadet, by whom it was apparently drawn up under instructions from the Société, and counter-signed by M. Charles Garnier, as President of the Société Centrale, which thus officially adopts the views expressed.

The following is the text of the document:—

"LES DEVOIRS PROFESSIONNELS DE L'ARCHITECTE ENVERS LUI-MÊME, SES CONFRÈRES, SES CLIENTS, SES ENTREPRENEURS."

La Société Centrale des Architectes français, Considérant qu'il est nécessaire de préciser les obligations morales qui ont toujours été la règle de conduite et l'honneur des architectes véritablement dignes de ce nom :

Qu'il est nécessaire, en effet, que le public, les clients et les administrations puissent avoir connaissance des garanties qu'on est en droit d'attendre d'architectes exerçant honorablement leur profession :

Déclare que les principes qui régissent la conduite des architectes dans leurs relations avec leurs confrères, leurs clients et les entrepreneurs ou le personnel du bâtiment sont les suivants :

I.—Devoirs de l'Architecte envers Lui-Même et envers ses Confrères.

1. L'architecte est défini, par le Dictionnaire de l'Académie française, en ces termes :

"L'artiste qui compose les édifices, en détermine les proportions, les distributions, les décorations, les fait exécuter sous ses ordres et en règle les dépenses."

Par conséquent, l'architecte est à la fois un artiste et un praticien. Sa fonction est de concevoir et d'étudier la composition d'un édifice, d'en diriger et surveiller l'exécution, de vérifier et régler les comptes des dépenses y relatives.

2. Il exerce une profession libérale et non commerciale. Cette profession est incompatible avec celle d'entrepreneur, industriel, ou fournisseur de matières ou objets employés dans la construction.

Il est rétribué uniquement par des honoraires, à l'exclusion de tout autre source de bénéfices, à l'occasion de ses travaux ou de l'exercice de son mandat.

3. Si un architecte a pris un brevet pour un produit concernant l'industrie du bâtiment, il ne l'exploite pas personnellement, mais il le vend à un industriel, en lui cédant tout ses droits de propriété pour l'exploitation.

4. L'architecte, n'étant ni commerçant, ni agent d'affaires, s'interdit toute opération qui donnerait lieu à des remises ou commissions.

Il s'abstient de faire, dans un but personnel, des annonces, réclames ou offres de services par voie de journaux, affiches, enseignes, prospectus ou tous

autres moyens de publicité en usage dans les professions commerciales.

5. Il s'interdit de rechercher des travaux ou de la clientèle au moyen de concessions, commissions, remises sur ses honoraires ou autres avantages qu'il ferait à des intermédiaires, tels que gérants, hommes d'affaires ou mandataires quelconques de propriétaires, et en général tous agissements qui puissent être secrets vis-à-vis d'un client soit actuel, soit éventuel.

6. Vis-à-vis de ses confrères, l'architecte s'interdit le plagiat, ainsi que la méconnaissance des règles délicates que la conscience impose aux artistes dignes de ce nom dans leurs rapports entre eux.

Il ne recherche pas la situation ou la clientèle acquise à un confrère. S'il est cependant appelé à recueillir cette situation ou cette clientèle, par suite du décès, de la retraite volontaire ou de la révocation d'un confrère par qui de droit, le nouvel architecte se considère comme le gardien de l'honneur et des intérêts de la confrérie.

7. Il reconnaît la qualité de confrère et en donne le titre à tout architecte exerçant honorablement la profession.

Il donne autant que possible la priorité à ses confrères pour les fixations de rendez-vous, les convocations, les réceptions, &c. Lorsqu'il y a lieu à réunion entre plusieurs architectes, les réunions ont lieu au cabinet du plus âgé.

8. Lorsque l'architecte emploie chez lui, comme dessinateurs ou commis, des jeunes gens qui font ainsi un stage d'instruction professionnelle, il leur donne le concours de son expérience et les traite avec les égards voulus par la confraternité.

II.—Devoirs de l'Architecte envers ses Clients.

9. L'architecte consacre à son client :

Le concours de tout son savoir et de son expérience dans l'étude des projets qu'il lui a demandés, dans la direction et la surveillance de ses travaux, ainsi que dans les avis ou conseils à lui donner ;

Tout son dévouement à la défense des intérêts qu'il lui a confiés.

10. Toutefois, l'architecte ne se prête pas à des opérations, même exigées par le client, qui seraient de nature à léser les droits des tiers.

Il ne se prête pas davantage à des opérations qui lui paraissent de nature à le compromettre, ou à compromettre des tiers, ou à entraîner des accidents.

Dans ces cas, il avertit son client de l'impossibilité qui lui apparaît de donner suite à ses demandes.

11. Il avertit également son client lorsque celui-ci, par des modifications aux travaux prévus, s'expose à une augmentation de dépenses.

12. Il se rémunère par son client, et ainsi, non seulement il ne reçoit aucune rémunération sous quelque forme que ce soit de la part d'entrepreneurs, fournisseurs, vendeurs ou acheteurs de terrains ou de propriétés bâties, ayant contracté ou pouvant contracter avec son client ; mais encore lorsque la rémunération de son travail doit rester, en fin de compte à la charge de tiers, les honoraires qui lui sont dus de ce chef sont soldés par son client, sauf à ce dernier à s'en faire rembourser par qui de droit.

13. Il remet à son client une expédition des plans, cahier de charges et marchés ayant servi à la passation du contrat ; il reste en possession de ses minutes, ainsi que de toutes les études préparatoires et des détails d'exécution. Il remet également à son client les mémoires des entrepreneurs qu'il a vérifiés et réglés.

14. Pour les travaux d'entretien, administration, vacations, &c., l'architecte produit, ordinairement, une note annuelle d'honoraires ; pour les travaux neufs ou travaux de grosses réparations, il reçoit, sur ses honoraires, des acomptes proportionnels aux sommes dépensées.

15. L'architecte se récuse s'il est nommé expert dans une affaire où l'un de ses clients est en cause. Il en est de même s'il a déjà émis un avis au sujet de l'affaire en litige.

Lorsqu'il est désigné comme expert par son client, par exemple dans une question d'assurance, d'enregistrement, &c., il n'est plus le mandataire de son client ; il n'est plus qu'expert.

Quand il opère comme arbitre, ses obligations sont les mêmes.

III.—Devoirs de l'Architecte envers les Entrepreneurs et le Personnel du Bâtiment.

16. L'architecte emploie son autorité morale en vue de rendre aux ouvriers les travaux de leur profession le moins pénibles possible, et d'assurer la bonne harmonie, la cordialité et l'honorabilité dans les rapports entre toutes les personnes occupées sur ses travaux.

17. Vis-à-vis des entrepreneurs ou des fournisseurs, l'architecte s'interdit de recevoir aucune remise, commission ou don, soit en argent, soit en nature, que ces entrepreneurs ou fournisseurs soient d'ailleurs employés ou non dans ses travaux.

18. L'architecte s'interdit également d'insérer dans les cahiers de charges et marchés des entrepreneurs aucune clause astreignant ceux-ci à des dépenses envers lui, telles que remboursements de frais de déplacements, vacations, &c., ou à l'occasion générale de frais généraux ou particuliers, à l'exception toutefois des frais de calques, autographes, expéditions



de cahiers de charges mis à la charge des entrepreneurs, et ce, à la condition expresse que cette clause figure dans le cahier de charges ou autre document connu et signé du client.

10. Il délire à l'entrepreneur des propositions d'acomptes ou de soldes, d'après les conditions du marché, ou, en l'absence de marchés, d'après l'état d'avancement des travaux.

Dans les travaux en règlement, il donne, sans déplacement de pièces, communication à l'entrepreneur de ses mémoires vérifiés et réglés; il vérifie et règle ensuite ses réclamations, s'il en est produit.

A moins d'une mission spéciale du client, il ne se charge pas des paiements.

20. Lorsqu'un architecte a pour client un entrepreneur ou une société d'entrepreneurs, il est, dans ce cas encore, rémunéré uniquement par des honoraires. Il ne subit jamais l'alca de gains ou de pertes qui est l'essence de l'entreprise, en contradiction avec l'exercice de la profession libérale de l'architecte.

21. L'architecte qui se fait entrepreneur ou commis d'entrepreneur, mètreur, vérificateur, perd la qualité d'architecte.

Il ne la perd pas en se faisant commis d'architecte.

Le Rapporteur, J. GUADÉ.

Vu :
Le Président de la Société centrale
des Architectes français, membre de l'Institut,
CH. GARNIER.

A note to the above document records that it was unanimously adopted by the congress of architects held at Bordeaux in 1895.

SILCHESTER.

ON Wednesday last, June 1, an exhibition of the objects of interest found during the past year on the site of the Roman city of Silchester, in Hampshire, was opened at the Society of Antiquaries, Burlington House, and will remain open until June 15. The portion of the site excavated during the past year is marked on the large plan of the city as *Insulae xvii.* and *xviii.*, lying in the south-west angle of the city, near the south gate. Although no mosaic pavements or any objects of much architectural interest or detail have been found, the plans of several houses of some size have been recovered—some of the "corridor" type, others of the "courtyard" type, and one of a type not hitherto found. In *Insula xvii.* two hypocausts were discovered, not apparently directly connected with either house and presumed to have formed distinct buildings, for what exact purpose is not known. In *Insula xviii.* were found two wells, with the lining formed of tubs similar to one illustrated in these columns last year,* but in better preservation and of larger

See *Builder*, June 5, 1897.

size. Each of these tubs measures rather over 6 ft. in height, and they were sunk in the ground to a depth of about 15 ft., and were supported by a rough wooden framework, part of which is also among the exhibits.

The houses found in some cases bear traces of having been rebuilt at a later period, causing some confusion in the lines of the foundations; but little of the boundary walling exists. In many cases it was probably only a wooden fence. One of the buildings found in *Insula xviii.* had a courtyard towards the street, in which were six rough circular foundations placed a little distance apart, three on either side. These are thought to have been the foundations of querns, and fragments of two of the querns have been discovered. The method of working is shown by a careful diagram by Mr. George Fox, F.S.A., exhibited on the wall.

The only strictly architectural details found are portions of plinths or pedestals with moulded edges, having simple, but excellent, sections. The chief objects of interest in the present exhibition are chiefly of decorative work. Many fragments of brooches, pins, small instruments, and pottery have been found, and if generally not so interesting a collection as on some former occasions, a few are of somewhat exceptional interest. Several portions of bowls of Samian ware are shown, one of which we illustrate. Of another type is the large pot, also illustrated, dark grey in colour, ornamented with broad bands painted black, and roughly incised ornament introduced between them.

Among the examples of work in bronze are two brooches, both of which we illustrate. The larger one is about 2 in. in diameter, circular, the background of the ornament being of a deep blue enamel. In the centre is a small oblong opening, and at the back are remains of the fastening. The ornament takes the form of a cross, the spaces between having a conventional leaf. The smaller brooch has also a blue enamel background, the ornament in this case being of a much simpler kind, although curious. This brooch is about an inch in diameter. The very curious bronze object, marked No. 4 on our illustrations, is slightly over 3 in. in height, and its use has not yet, we believe, been decided. The lower portion is octagonal on plan, and somewhat resembles a candle extinguisher. The upper part is finished with a well modelled eagle's head, while from the front projects a swan's head and neck. A hole has been made in two sides, though whether other ornaments fitted in here or not is doubtful.

It is intended during the present year to complete the exploration of the south-west

angle of the city. Work, we understand, has already been begun, and a mosaic pavement of some interest unearthed, and it is hoped that funds, which are urgently needed, will be forthcoming to help towards the completion of these very interesting excavations.

We have to thank the Society of Antiquaries for kindly allowing us to have the drawings made which illustrate these notes.

THE ARCHITECTURAL ASSOCIATION: ANNUAL DINNER.

THE annual dinner of the Architectural Association was held on Thursday last week, in the Caledonian Salon, Holborn Restaurant. The chair was occupied by the President, Mr. Hampden W. Pratt, who was supported by Dr. W. Garnett and Messrs. W. D. Caroe, F. R. Farrow, A. S. Flower, H. T. Hare, F. H. A. Hardcastle, W. J. Locke, H. Lavegrove, Beresford Pite, F. W. Pomeroy, G. H. Fellowes-Prynne, E. Fellowes-Prynne, E. A. Runtz, H. Tanner, and others.

The loyal toast having been honoured, The Chairman proposed the toast of "The Royal Institute of British Architects." The Institute was regarded in certain circles outside its own ranks as being at the head of the profession, and that was the right place for it to occupy; but, unfortunately, there were certain eminent architects who were outside its ranks, which was a calamity, not only for the Institute, but for the profession; and, while that was so, architects could not speak with that united voice which was so desirable. He thought he was interpreting the feelings of all in saying that they would like to see the Institute the one representative body of the architectural profession. He had never been able to understand the position held by another architectural society, and if the time had not already come for that body to dissolve and throw in its lot with the Institute, he hoped that it soon would. What were the views of architects themselves as to the Institute? Many architects considered that the Institute might be governed a good deal better than it is, and that it required much alteration in the constitution of its Council. It was a sign of the times that the Associates, who had so large a voice in the affairs of the Institute compared with what they had a few years ago, should seek to use the powers they possessed to improve the Institute. There was no doubt, he thought, that it would be for the good of the Institute if there were a certain amount of reform in the constitution of the Council.

Within the ranks of the Institute there were men who considered that it was able to exercise a large amount of influence for the good of the profession, and this opinion was largely held by the members of the allied societies, who looked up to the Institute in a very striking manner. For the last few years the Institute had been allied much more closely with the Association than it used to be, and it was to the advantage of both bodies that there should be this close alliance. As most of them knew, for several years past the Association had been represented each year on the Council of the Institute, and the advantage of this to both bodies, especially to the Association in regard to its educational work, must be obvious. The Institute had materially assisted the Association by its yearly grant of £100 for the last seven years, and the Association the more readily accepted that help because they considered that the Institute reaped much of the advantage in ultimately receiving into its ranks young men who had been trained by the Association well enough to pass the examinations of the Institute. The Association, by its systematic course of study, had been able to do more for the Institute and the profession than it was possible for the Institute to do alone. There was much difference of opinion as to the examinations, and however much they might disagree with the way those examinations were conducted, they must acknowledge that benefits and advantages resulted from them. Both bodies were working hand-in-hand and yet independently, and they were animated by one desire, viz.: to raise the tone of the profession and to advance the art of architecture. The President of the Institute was, unfortunately, absent that evening, owing to his indifferent health, but with the toast he would couple the name of Mr. W. D. Caröe, a member of the Council of the Institute.

Mr. W. D. Caröe, in response, regretted the absence of Professor Aitchison, and said that the Institute realised that its life blood ran in the veins of the Association. It was a truism that youth was the hope of old age, and he certainly thought that the Association was the hope of the Institute. He was fully aware of the large and increasing part that the various allied societies in the country now took in the work of the Institute, but, perhaps, a more cordial feeling existed between the Institute and the Association owing, among other reasons, to their close contact in work. As to the Association, he thought, they must look for an improvement of the Institute. What was lacking in the profession was enthusiasm, and what the Institute mainly wanted was the enthusiasm and the fresh ideas of youth. He heartily agreed with Mr. Pratt that there should be such a reform in the constitution of the Council of the Institute, that the younger men should have more opportunities than they possess now. He had often thought that it would be an excellent alteration for the Institute Council to be made a rotary one, i.e., for some of its members to retire after a few years' service, and so give place to others. Every architect who had visited the Academy this year must have been struck with a model of a church, and it gave him, as a past-president of the Association, great pleasure to know that the model was the work of a member of the Association who had been trained in the Association classes. It was on work of that kind that the future of the Institute depended, and he hoped that equally good results would come from all the work of the Association classes.

Dr. Garnett, in proposing the toast of the evening, "The Architectural Association," said that the Association was carrying out most important, most valuable, and most efficient educational work. In the first place it was dealing with a view to the Examinations of the Institute; and, better than that, it was carrying on classes in design and water-colour drawing, and in association with another institution, it was providing practical classes for members of the Association to become acquainted with the properties and limitations of the materials with which they had to do. He hoped that those classes would continue to grow, and that the young members of the Association would realise the value of learning to use the tools as well as pencils. In addition to this, the Association was also carrying on a very useful and important educational work in its fortnightly meetings for mutual improvement, which was the best of all improvements. At such meetings papers were often provided by eminent experts, who gave information which

could not be obtained from any other source. The Association was likewise doing a very good work in helping to establish a bond of union between the members, young and old, and he could not think of any means by which members of any profession could make themselves more useful than by joining together in an association of that kind. The Association was especially helpful to young architects who came to London from the provinces, and altogether it was thoroughly deserving of support.

The Chairman, in response, said that Dr. Garnett had shown by his remarks that he had taken hold of the vital points of the work of the Association. No name so well expressed what their society was than that one word—"Association." From the outset, it had endeavoured to work for the mutual good of the members, and with the desire to advance their noble art. It was very pleasing that some of their members had been associated with them from the first, and that so many eminent architects gave students the benefit of their advice and criticism in the School of Design. The bond of union between young and old members was certainly the life of the Association. They were endeavouring to draw that bond of union closer, in order that students might see the advantage of joining such a body, for as members they gained not only systematic education, but friendship with one another. As to the fortnightly meetings of the Association, it was quite true that at those meetings papers of great value were read, and the discussions which followed were of considerable advantage to both young and old students, and it was rather regrettable that more older members did not go to the meetings and take part in them. The enthusiasm which Mr. Caröe had referred to was not wanting in the Association, and he hoped it would never be wanting. He thought that one advantage of the short term of office of President of the Association was that a President, if he fulfilled his duties, concentrated his attention on the work of the Association, and was able in that way to throw much more enthusiasm into his work. He thought that it was well to restrict the term of office of President to one year in most cases, for in that way they could get a greater variety of men to serve them in that capacity. In past years they had had many brilliant Presidents—men who occupied very high positions in the profession—and they all, he believed, attributed much of their success to the work of the Association in which they were engaged. In regard to the Jubilee of the Association which was celebrated last year, it had been suggested that they should seek better premises in order to commemorate the event. They had not been able to do much in that direction so far, and at present they were seeking a site; but the matter had not been forgotten. The Association was maintaining its financial position, and he thought that the result of the year's work would show a better balance-sheet than for many years past. That result would be an inducement to them to go forward with the premises question. He retired from the position of President thankful for all the kindness and help which had been accorded him.

Mr. Beresford Pite, in giving the toast of "The Lecturers and Instructors," said that their lecturers and instructors were those friends who filled up the gaps in the professional education of the young architect. Architects were educated on the old patriarchal system; they were brought up in families, and were bound hand and foot by articles of indenture, and pursued their office education among drawing boards and specifications. If it were not for the lecturers and instructors, the Association students would go up for the Institute examinations to be hopelessly plucked. Thanks to a far-seeing past-President, Mr. Leonard Stokes, the Association's scheme of education came into existence, and ever since they had been depending upon their lecturers and instructors. He did not think that the Committee, at the outset, contemplated obtaining such an excellent body of instructors, lecturers, and Visitors as had been drawn to the Association. Before the inauguration of their scheme of education, they saw that the Institute had established the Examinations; the Association provided the examinees, but there were no lecturers and instructors. That was all changed now, and he believed that the time was not far distant when those lecturers would have a place—a proper place—on the Board of Examiners of the Institute. Their scheme

would not be properly established until the instructors were in touch with the examiners. What the profession owed to the instructors could scarcely be estimated when they thought, for instance, of the number of flourishing architects who had passed through the hands of Mr. Farrow, their lecturer on the History of Architecture and Construction. There was one necessary class which had not yet been established, which was suggested to him sometime ago by a cynical friend, who said that a student might have his head full of technical fact and his fingers trained to technical skill, but he would not necessarily be successful in life unless, in addition, he had "cheek," which was the quality necessary to success in life. That friend suggested that a paternal government should appoint professors of "pure cheek" at the Universities and elsewhere, and he (the speaker) did not doubt that the Association might be able to suggest some occupants for these chairs.

Professor F. E. Hulme, lecturer on plane and solid geometry, in the course of his reply, said that he lived near Kew Gardens, where a royal palace had just been opened to the public. He was greatly afraid that that building, which was so full of interest, would degenerate into one more museum at Kew. The building was one of great historical interest, and no mean architectural value, and he hoped it would not be filled with objects which, however interesting, would be out of place there. The rooms were fine and spacious, and it would be a pity to devote them to wall and floor cases, and he thought that the building should be preserved intact as far as possible. The rooms, in his opinion, should be left very much as they are at present, but he was afraid that the custodians of the place would look upon the building merely as another museum.

Mr. F. R. Farrow also briefly replied, and remarked that he looked upon his work for the Association as a slight recompense for what the Association had done for him. He was glad to hear there was some chance of better accommodation being provided in the future than was afforded at Great Marlborough-street. He hoped that the committee would remember that sound-proof rooms would be necessary in any new building they might provide.

Mr. A. H. Hart then proposed the toast of "The Guests," coupled with the names of Mr. H. T. Hare and Mr. W. J. Locke.

Mr. Hare, in responding, said that some sixteen or seventeen years ago he was a member of the Association, but, unfortunately, he allowed his membership to lapse, though he had always followed with interest the reports of the meetings of the Association. At the time he was a member, their organisation was very different from what it is to-day, and it did not present the same advantages. He hoped that when next he attended their annual dinner it would be as a member and not as a visitor.

Mr. Locke having also briefly and felicitously responded.

Mr. A. Conder gave the "Committee and Officers," coupled with the names of Mr. F. G. F. Hooper and the hon. secretaries. They were losing the services on the Committee of Mr. Hooper and Mr. Goldsmith, who were retiring after three years' excellent service on behalf of the Association.

Mr. Hooper said that although they were retiring from the Committee, they would do their utmost, in an unofficial capacity, to further the interests of the Association, which they all had so much at heart.

Mr. G. B. Carvill also replied on behalf of himself and Mr. Howley Sim, hon. secretaries. He remarked that their labours were much lessened by the manner in which he and Mr. Sim were assisted by every branch of the Association.

Mr. Banister F. Fletcher then proposed the last toast, "The President-elect." In Mr. Prynn they had a President-elect who in all respects was an admirable one. He had been a member of the Association for many years; he had been a Visitor to the classes, and he had taken a considerable amount of interest in all the work of the Association. They believed that Mr. Prynn would guide the Association with success and with honour.

Mr. Fellowes-Prynn, in reply, said he could not but feel a difficulty in following those who had preceded him as President. It would be invidious to pick out names from such a list of excellent Presidents, but taking those with whom he had been associated on the Committee, there was their genial friend,

Mr. Mountford, who was their President for two years; then there were their admirable chairman, Mr. Carde, and their orator, Mr. Beresford Pite, and last, but not least, their truly business President, Mr. Pratt. His difficulty was that he had to follow such able men—men who had worked so sincerely and so successfully for the good of the Association. But he was on his mettle, for he felt it was no small honour to be elected as their President. There was in every way an honourable and an invaluable Association. As architects, the one thing above all others they must feel was the want of more *esprit de corps*, and he thought the Association had done much to supply the want. What was wanted was the loyalty of the younger members to those who, by their abilities, were acknowledged leaders in the art they all loved so well; and the help to the younger members of the profession of those who were leaders. Thorough good fellowship was needed amongst architects. Artists were always students, and architects should feel that studentship did not stop with the Examinations of the Institute. He could not but feel that in the Association they had the nucleus of brotherhood in art, and he wished that feeling properly existed in the Institute. He did not think it did, for in the Institute there was a cold feeling which did away with the feeling of fellowship which ought to exist among all true artists. He hoped that, as the ranks of the Institute were gradually filled by members of the Association, the feeling of brotherhood in art would exist, not only in the Association but in the Institute itself.

The proceedings then terminated. The following members of the Association assisted in the musical entertainment during the evening: Messrs. S. Constanduros, G. B. Carvill, F. D. Clapham, C. D. Imhof, and J. H. Wilson.

SKETCHES OF LONDON STREET ARCHITECTURE.—XXV.

THE fronts shown here, forming Nos. 6 and 7, Bark-place, W., form two of a new terrace of houses, of which Messrs. Rolfe & Matthews are the architects. They serve to illustrate the type of house architecture now being carried out in some of the new West-end streets.

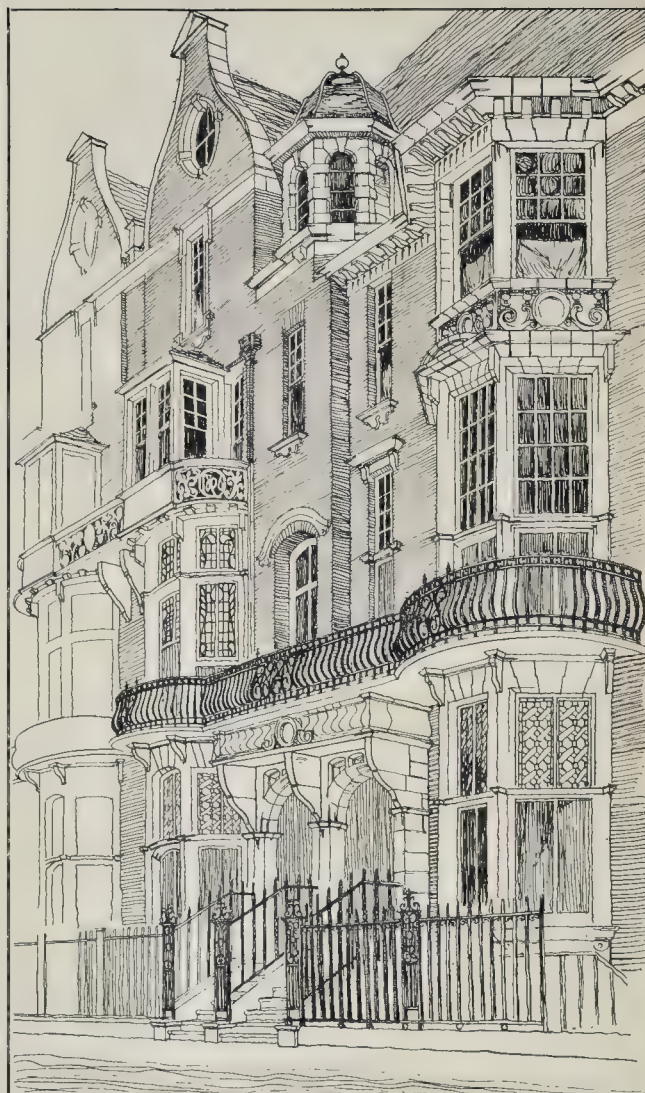
THE INSTITUTE OF BUILDERS: ANNUAL DINNER.

THE annual dinner of the Incorporated Institute of Builders was held on Thursday evening, May 26, at the Trocadero Restaurant. The President, Mr. Henry Holloway, took the chair, and amongst those present were Mr. Thos. Blashill (Architect of the London County Council), Lieutenant-Colonel Trollope, the Master of the Tylers' and Bricklayers' Company, the Master of the Joiners' Company, Messrs. Frank May, J.P., John Slater, M.A., Joseph Bell, J.P., G. Kett, J.P., J. Randall, T. F. Rider, B. J. Greenwood (President, Central Association of Master Builders of London), J. Stevenson Jones (President, National Association of Master Builders of Great Britain), Geo. Burt, J. H. Colls, J. Bowen, J.P., F. J. Dove, T. P. Whittaker, M.P., Howell J. Williams, L.C.C., W. Shepherd, S. Young, H. H. Bartlett, and others.

The usual loyal toasts having been duly honoured, Mr. Greenwood proposed the "Army and Navy," remarking that as master builders they knew something of warfare—a different kind of warfare, all the more obnoxious because there was no martial glory to be won. Discretion was said to be the better part of valour, and master builders of London had exercised the very height of discretion, but a time would come when something more would have to be done.

The toast was coupled with the name of Lieutenant-Colonel Trollope, who, in responding, said there was one point in which builders might well take an example from the authorities of the Navy, who did not expect to find able-bodied seamen ready made, and got boys for training at the earliest possible age. The builders of London seemed to think that complete tradesmen grew on the roadside, and took not the slightest trouble to make them. The great cause of trouble was that there was not a sufficient number of men. It was the builders' own fault, because they would not train apprentices.

Mr. Jones then proposed the toast of the



Sketches of London Street Architecture.—No. XXV. Houses Nos. 6 and 7, Bark-place, W. Messrs. Rolfe & Matthews, Architects.

evening, "Success to the Institute of Builders and the President." The Institute was one of the greatest institutions they had in connexion with their profession, and they hoped that in the future its usefulness would be even greater than in the past. In Mr. Holloway they had a President who had done great service to the building trades, and had filled some of the highest positions in their trade associations.

The Chairman, in reply, said two years ago, when he happened to be President of the Association of Master Builders, they had rather a disturbed time, but after many patient conferences they arrived at certain rules and regulations which, on paper, some of them considered delightful, and an example to all future ages as to the settlement of strifes and difficulties. Although on paper those regulations seemed all one could desire, in practice they had not yielded the results that had been hoped for. As builders, the members of the association, he was bound to say, accepted those rules and acted up to them in a proper spirit, but unfortunately as soon as the trade societies got an advantage they ignored every part of the agreement which had been made to settle these disputes, and, as they all knew, there had since been no end of troubles and difficulties.

He thought that all they could do at present was to be loyal to each other and stick together, and a time would come when they would have to institute a definite settlement by which these turmoils would be brought to an end. With regard to the Institute, Mr. Jones had intimated that they had been able by that combination to gain some advantage for the trade which they represented. They had been fortunate in their selection of presidents in the past, and his immediate predecessor, Mr. Shepherd, had done yeoman service in connexion with the Building Acts, the question of workmen's compensation, the settlement of the conditions of contract, and the questions at issue with the London County Council. The conditions of contract were at present in a very unsatisfactory condition. The Royal Institute of British Architects had inserted from time to time conditions which they as builders had explained were not fair and equitable to both parties, and they would be delighted if an arrangement could be come to with that august body to end the constant strife arising between builders and architects. In a dozen cases his firm had had these conditions put before them, and had courteously declined to sign them, and they found in every case that the archi ec

ave way. The architects would be acting in the interests of their own dignity by putting an end to that kind of thing. It was unpleasant for the builder to have to raise the question, and it must be unpleasant for the architect to have to give way, and modify conditions which his Institute called upon him to enforce. He would be delighted if something could be done during his year of office to settle this question, which had now been pending for eight years. As an Institute they had some things to congratulate themselves upon. Trade was prosperous, and was likely to continue prosperous. The House of Commons was spending money in the most glorious way. The Government had voted an enormous sum to be spent in building operations, and the London County Council had also large schemes on hand, so that there was likely to be plenty of building to be done. That brought him to a point Colonel Trollope had touched upon, and which he would like to emphasise. The very fact of this enormous amount of trade being before them ought to make them alive to the necessity of trying to increase the number of skilled mechanics. The trouble in London was not that they could not get men, but that they could not get men skilled in the various trades. There were plenty of "duffers" about, they wanted thoroughly equipped workmen, but they would not get them until, as Colonel Trollope said, they manufactured skilled workmen in the proper way. There was another question they might have to look at in the future—to know who were builders and who were not. They had with them Mr. John later, who had been sitting with the corner at that extraordinary inquiry about the jerry building at Westminster, and he was sure Mr. later's impression would be the same as theirs, that it was nearly time they began to know who were builders and who were not. He believed the very gentlemen entertaining them in that place posed as builders and decorators and contractors. They heard of drapers and butchers taking up the building trade. They were careful as to who got into the Institute, and he could say that every member understood his work, and if a job were entrusted to him it would be done thoroughly. If they could have architects who would do their work and not speculate themselves, and architects who understood their work, they would not have accidents like the unfortunate one at Westminster a few weeks ago. He hoped they as builders would have a feeling of respect for their trade, and be anxious to uphold its honour. There was no more interesting trade in existence than that of the builder. Their work did not end with the day in which it was taken in hand. It lived for generations, and one of the personal ambitions he had before him was to erect such buildings that the children who came after him would be proud to look upon them, and to remember that their father had a hand in their erection. Let them cultivate that spirit, and do work of which posterity would be proud, and with which their and their offspring would feel proud that their names were connected.

The next toast was "The Architects and Surveyors," which was proposed by Mr. H. H. Bartlett, who said he was glad the toast was in the plural. They did not like the architect who wanted to be his own surveyor, or the surveyor who wanted to be an architect. The two professions had each its own work, and they could not very well mix with advantage to the architect, the surveyor, the client, or the builder. Nowadays the architect needed a wide knowledge of many scientific questions, some of which were looked upon as of but little importance only a few years ago. He thought they might congratulate themselves that they had architects who were equal to the times they had fallen upon. London was becoming one of the most beautiful cities in the world. If they looked down the river towards the City from Westminster Bridge, the vista was one which could scarcely be equalled in Europe. The architects he had had the good fortune to meet were most agreeable, fair, and painstaking in their work. As to surveyors, their position between the architect and the builder was such that necessarily the utmost confidence must be felt in them by both sides. As a body they deserved the highest consideration. If he might venture a hint to architects, he would ask them to remember that time was not what it was a few years ago, yet a building was expected to be done even more quickly. That was impossible in the present circumstances. Men worked shorter hours, and often

only half worked and half played. Crowding men on the work did not pay, and he would ask architects to remember the changed conditions and to allow more time. Another thing would be to help in the constant difficulties arising with plasterers by, as far as possible, making other things take the place of plaster. This could be done, and would greatly assist the progress of the work. In conclusion, he coupled with the toast the name of Mr. Blashill for the architects, and Mr. S. Young for the surveyors.

Mr. Thomas Blashill, in responding, said that architects had the greatest confidence in and respect for builders. If any architect had not such confidence it was his own fault, for architects had so much influence in the selection of the builder, that lack of confidence would show that the architect had neglected to get into touch with honourable men. His sympathy was with the builders, and went beyond them to the workers, and he hoped the relations between masters and men would shortly improve. He entirely agreed with what had been said as to the necessity of creating the workmen of the future by a proper system of apprenticeship. As had been said, there had for some time been differences between the architects and the builders. He had long been impatient that the matter should drag on so long; he was satisfied, considering how ably advised the master builders were, that a dozen persons from each side could meet round a table, settle the whole matter, and have time for a good dinner afterwards. There was a gentleman they heard a great deal of now, who was called an arbitrator. It was almost the extinction of the arbitrator to put him in the building agreement. The very fact that there was a possible appeal to an arbitrator seemed to drive the parties into settling matters for themselves on fair and reasonable terms. He had never in his life had occasion to appeal to an arbitrator.

Mr. S. Young also responded, and said that the quantity surveyors, like the builders, sometimes found all sorts of people taking up their business. There were cases, as they all knew, where the responsibility was cast on the builder of satisfying himself in three days as to the correctness of quantities that a skilled man could hardly go through in a month—with a condition that no error could be afterwards admitted. On the second page they would find items which it would puzzle any man to understand, but on the last page a very clear and simple item, in the shape of a charge about twice as high as any skilled surveyor would make. It was to the credit of the builders that such quantities as these were generally returned. Surveyors, as Mr. Bartlett had said, had but the one desire to act fairly and honestly in the preparation of their quantities. "Full" quantities would be a fraud on the client, and "short" quantities would quickly lead to the downfall of the surveyor; but the surveyor who took out quantities with due skill and diligence gave satisfaction all round. The surveyor's lot was not a happy one. On the one hand the architect imagined they could take out quantities in a fortnight which would reasonably take five weeks, and on the other there was the builder calling every day to know about the statement of extras and omissions. Thus the surveyor became a past master in the art of temporising and excuses.

The last toast was that of the "Visitors," to which Mr. Whittaker, M.P., responded.

Correspondence.

To the Editor of THE BUILDER.

OFFICIAL CONTROL OF BUILDINGS.

SIR,—The Superintending Architect, in his evidence at the recent inquest on the Westminster accident, expressed the opinion that there ought to be more official supervision of buildings, and the jury adopted the idea, and in your last article you are not unfavourable to it.

Is there not some danger that, if increased supervision were provided compulsorily, the persons who speculate in commercial buildings might more frequently follow the lead of those who speculate in dwelling houses, and dispense with all professional superintendence? At present few warehouses, manufactories, printing offices, &c., in London are built without an architect. The larger spans, heavier weights, and greater height seem to have deterred those

who put up commercial buildings from dispensing with an architect; but if the Building Act of the future is to provide complete supervision, this will no longer be the custom, and as a result the gain to the public will be of doubtful extent.

Should a future Building Act place the construction of other parts of a building than those now supervised under the District Surveyor, the wise course will be to give him a general control such as he has over public buildings now—not to devise a series of rules for internal construction. R.

WALTHAM ABBEY.

SIR,—I regret that, through absence from Town, I should have been unable to answer the letters sooner which appeared in your issue of the 21st ult., relating to this building.

It is not my intention to enter into a long controversy on this subject, nor do I imagine that you, Sir, would care to devote much of your valuable space to a discussion of what will, I suppose, always continue to be a vexed question; but there are some points in the letters above mentioned which seem to call for some notice from me.

As to the "single instance" which is brought forward by Mr. Lyman as a conclusive proof of the incorrectness of the theory that the design of Waltham Abbey can be as early as 1059-1062, namely, the fact that the nave arcade is in pairs of arches, surely, as this arrangement is found at the Abbaye-aux-Hommes at Caen, and in other French churches of the same date, it must have been known to Harold; and as to the general unity of design which exists throughout the nave, I have always been careful to notice this, as an interesting feature, in everything I have written on the subject, and I referred to it in the letter which appeared in your issue of May 7.

Mr. Bond alludes to the break in the design of this building, as if it were a fact which might be neglected. I maintain that it is not so, and I am convinced that any one who will take the trouble to study this junction of dates carefully and dispassionately, as I tried to do when taking the measurements, will come to the conclusion which was gradually forced upon me, viz., that it presents phenomena which must be taken into account before a safe conclusion can be arrived at: I do not say that in itself it proves conclusively that the five western bays were built by Harold, but I do say that it proves either that these bays were built by Harold, or that the church was entirely rebuilt between 1062 and the earlier years of the twelfth century.

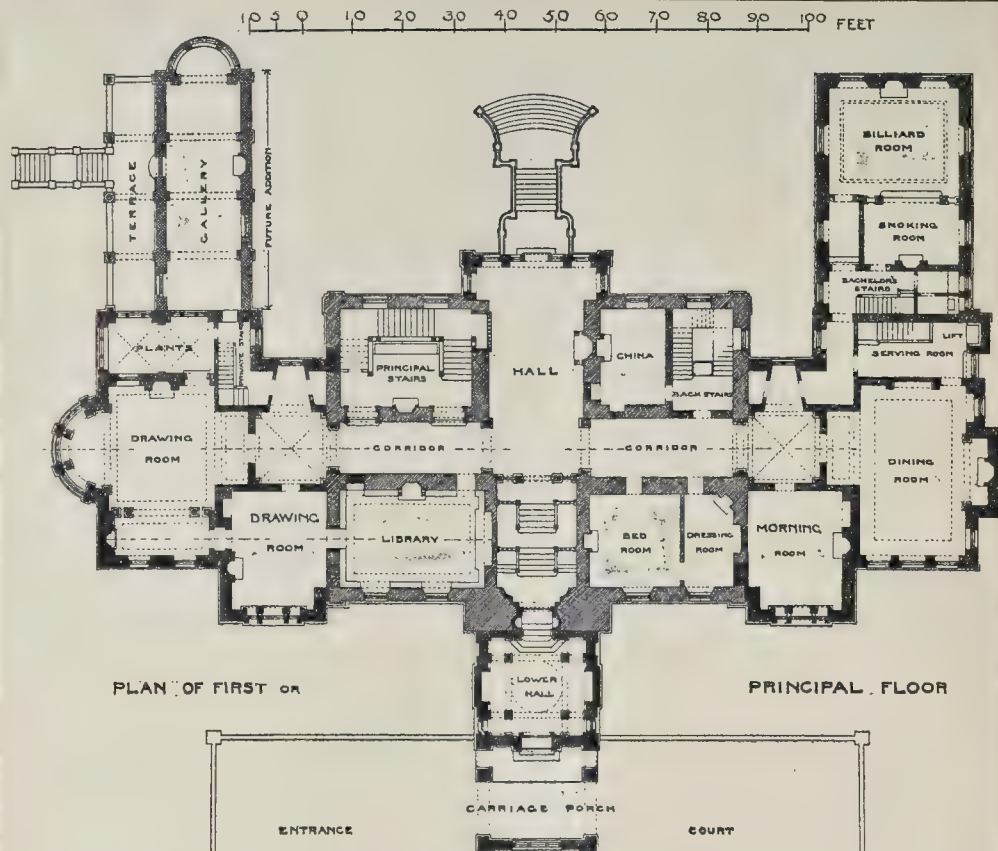
I quite agree with Mr. Bond, that too much importance may be attached to small breaks in design, but this is no ordinary break, such as one finds in almost every building of large size; it is associated with the very remarkable settlement which I described in my last letter, and with the several peculiarities which exist in the construction of the second bay from the east end on the south side of the church, and these peculiarities, as it seems to me, can only be explained on the assumption that this bay was built after the settlement took place, whereas it is manifest that the third bay was built before that date.

As I have on former occasions enumerated all the many differences which exist between the two parts of the church, I will now only call attention to a few of them—for instance, the chevrons on the main arches are different, both in section and in treatment; the capitals and bases are different; the columns of the clear-story are very dissimilar, those in the western work being built up in courses, while in the eastern bays they are monolithic; they also differ greatly on plan; and there is the great fact that the eastern bays are unquestionably associated with the well-developed running mouldings of the arch at the east end of the south aisle, and of the easternmost window of the south aisle.

These are all matters of detail; a distinct difference of design occurs in connexion with the triforium. In the western part of the church this stage was lighted by means of circular windows placed high up in the aisle walls, and these windows are omitted in the eastern bays.

I do not understand why Mr. Lyman should try to convince me that the conception, design, and execution of Waltham Abbey are Norman from base to summit, seeing that in my last letter I stated that there could be no doubt that such was the case; I apprehend that the whole difficulty arises from this fact, for if we found any distinctly Saxon details in the building there would be an end to the controversy, or perhaps I might say it would never have begun, for historical evidence proves that Harold did erect an abbey on this spot which was a very magnificent building, and was looked upon by his contemporaries as something almost, if not quite, unique.

Mr. Ferguson appears to me to have grasped the points of the case far more clearly than any of your other correspondents, and his suggestion as to the possible reconstruction of the arcade walls only is, I think, injurious; but he bases his argument on the theory that the great difference between the thickness of the arcade walls and of the outer walls of Waltham Abbey indicates that they do not belong to the same date, and yet in the list of large Saxon



Jardine Hall, Dumfries. Plan as altered and enlarged. (The portions shaded in black show the new work.)

churches which he quotes from Mr. Micklethwaite's paper on the subject he cites Carlisle Cathedral as an admittedly Saxon building, although precisely the same difference existed there between the corresponding walls.

However, apart from this, it seems to me to be historically quite as unlikely that the nave arcade should have been reconstructed as that the whole church should have been rebuilt immediately after the Conquest. Mr. Lynam does not appear to think that the historical side of the argument is worth very much, and yet apprehend that to Professor Freeman this view of the case appeared to be almost conclusive. Consequently, it seems necessary in discussing the subject to give some consideration to it.

The piece of walling which Mr. Ferguson draws attention to, as being of Saxon character, does no doubt possess an indication of herring-bone work, but it is not strongly marked throughout, and as it is merely the inside face of the west wall of the original south transept it is not a very important feature; it is, in fact, nothing more than one might reasonably expect to find in a building upon which Saxon wallers are almost quite certain to have been employed.

To conclude, may I say that if it is so utterly impossible that Waltham Abbey, as we know it, could have been designed by Harold, as some of your correspondents try to prove, it would seem to be practically impossible that the controversy about its date could ever have originated. Any one who knows anything about either Mr. Burges or Professor Freeman must be aware that they were not men who were likely to believe in an archaeological absurdity, and I do not think the question is quite so easy to settle as it certainly must be if the theory held by these two men was so foolish, that "it might almost as well be asked whether the building is 'Greek or Saxon.'" But again I repeat that no one says it is Saxon any more than we speak of the British Museum as being English.

May 30, 1898.

J. ARTHUR REEVE.

CYLINDER FOUNDATIONS.

SIR.—Your issue for May 28 contains a paper by Mr. A. T. Walmisley on "Riverside Foundations," in which he says: "Cylinder foundations were first

used by the late Sir William Cubitt at Rochester." This was, in effect, subsequent to the use of the pioneer cylinders at the Royal Terrace Pier at Gravesend, in 1842-43, which were visited by Dr. Potts, the patentee of the atmospheric process, before the enrolment of his patent, subsequently attempted to be used for the pier foundations of Rochester Bridge, but found inapplicable from the quantity of "detritus" in the river bed from the foundations of the old bridge, the system only being adapted for semi-fluid sand strata.

Detailed papers and drawings of each of these works and their respective dates may be found in the minutes of proceedings of the Institution of Civil Engineers.

Cylinders of pottery for founding massive buildings in India are of great antiquity and are described in the above journals.

J. B. REDMAN.

LEWISHAM LIBRARY COMPETITION.

SIR.—In October last year designs for the Branch Libraries in the above competition were sent in.

At Christmas the Vestry had advanced so far that Mr. Mountford was appointed to adjudicate upon the drawings.

Since that time the majority of the designs have been returned; but up to the present no award has been made—a condition of things which is unsatisfactory to the competitors as it is creditable to the Vestry.

Surely seven months is long enough for even a Vestry to make up its mind. NEMO.

BOOKS RECEIVED.

HISTORY OF LONDON STREET IMPROVEMENTS, 1855-1897. By Percy J. Edwards. (Printed for the London County Council.)

AN ADDRESS TO STUDENTS OF THE BIRMINGHAM SCHOOL OF ART. By William Morris. (Longmans & Co.)

FALL OF A WEST-END MANSION.—A mansion in course of erection in Devonshire-street, Portland-place, collapsed on Thursday morning, burying several men beneath the ruins.

Illustrations.

JARDINE HALL.

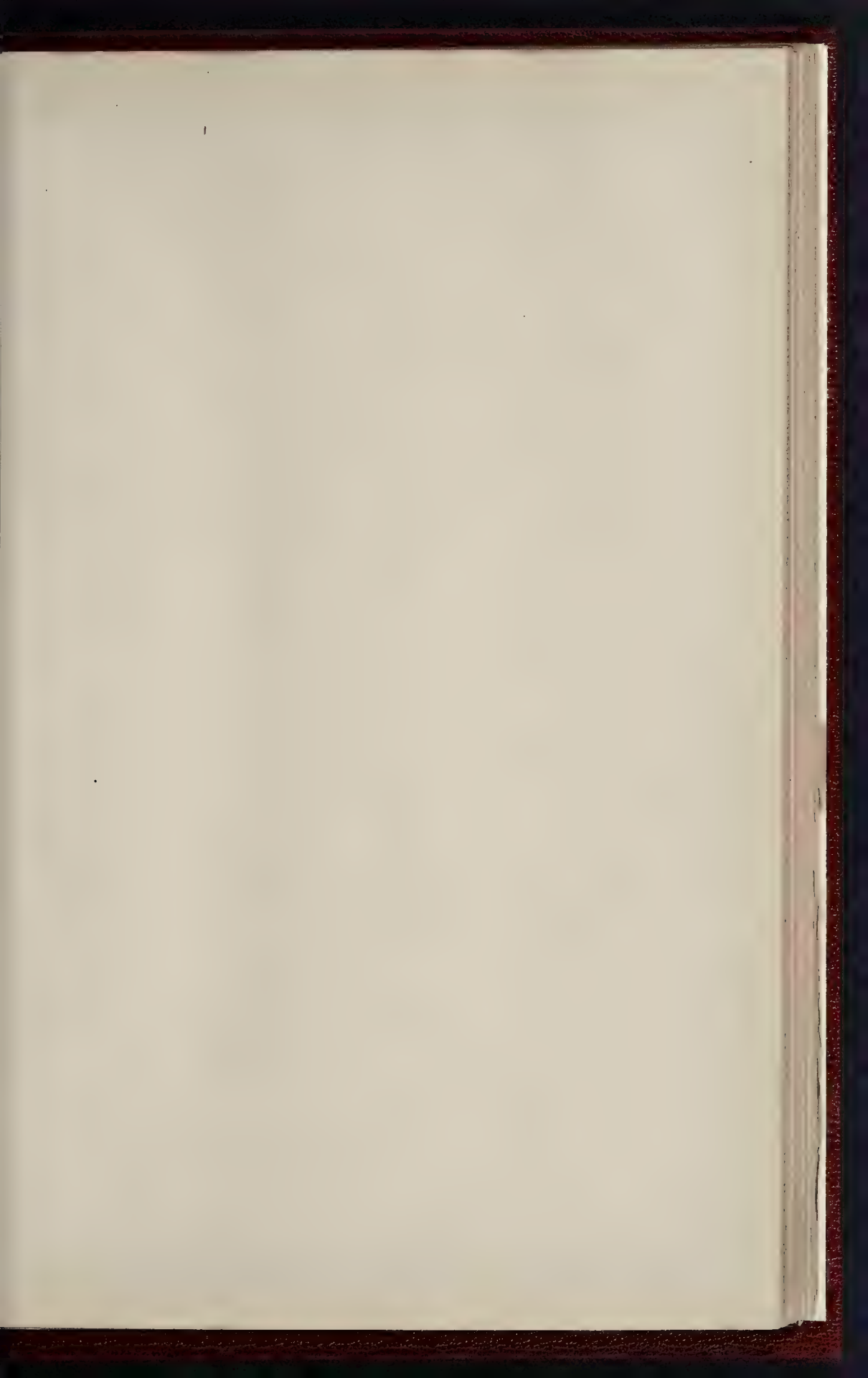
WE have devoted our lithographic plates this week to a complete set of illustrations of the new work at Jardine Hall, Dumfries, carried out by Mr. E. J. May, the drawings of which form one of the most important exhibits in the architectural room at the Royal Academy this year.

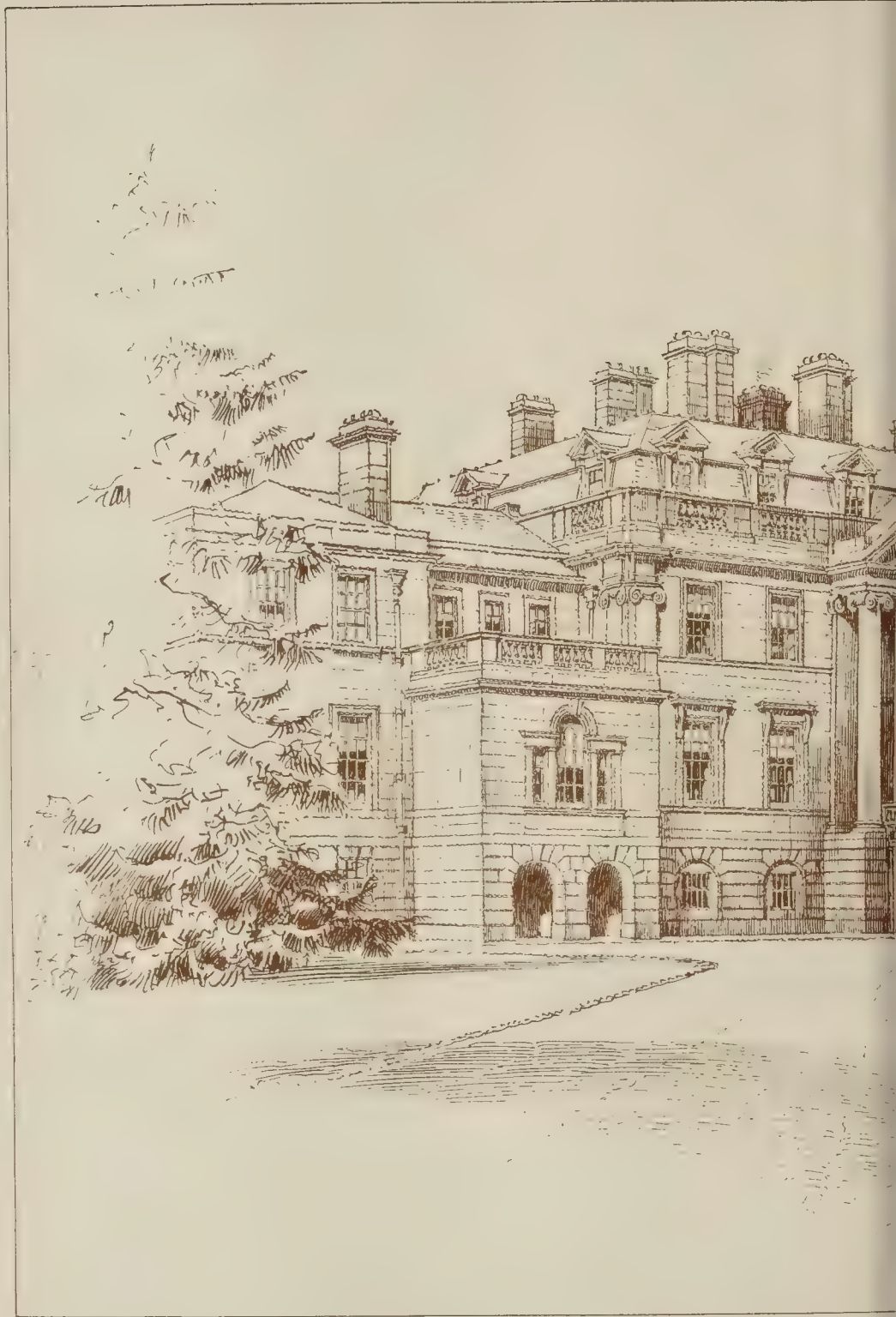
In the *Builder* for May 12, 1894, we gave the elevation and plan of the alterations (also a Royal Academy exhibit), together with small drawings on the same sheet showing the elevation and plan before the alterations. The remodelled plan we give again in this issue, as an explanation of the drawings.

As an example of the transformation of an old house in accordance with modern requirements, and on a somewhat sumptuous scale, while retaining the bulk of the original building, this is a very successful and interesting piece of work, and is worth the attention of young architects who may be called upon to take in hand a similar project.

We are indebted to Mr. May for the following description of the house and of the work done:—

Jardine Hall, as it existed in 1892, before the alterations now illustrated were made, dates from 1814, and had nothing in it of any architectural note. The recent works, including large additions to the stabling and a new laundry, were completed in 1897, and consist of wings containing the principal rooms, a new entrance, an additional story to the main old part, the entire re-arrangement internally of the old basement and principal floors, and new offices. The matter of kitchen and office accommodation has wonderfully changed since 1814. It was then, apparently, enough to provide a few rooms distributed about the basement without any connection; the cook's



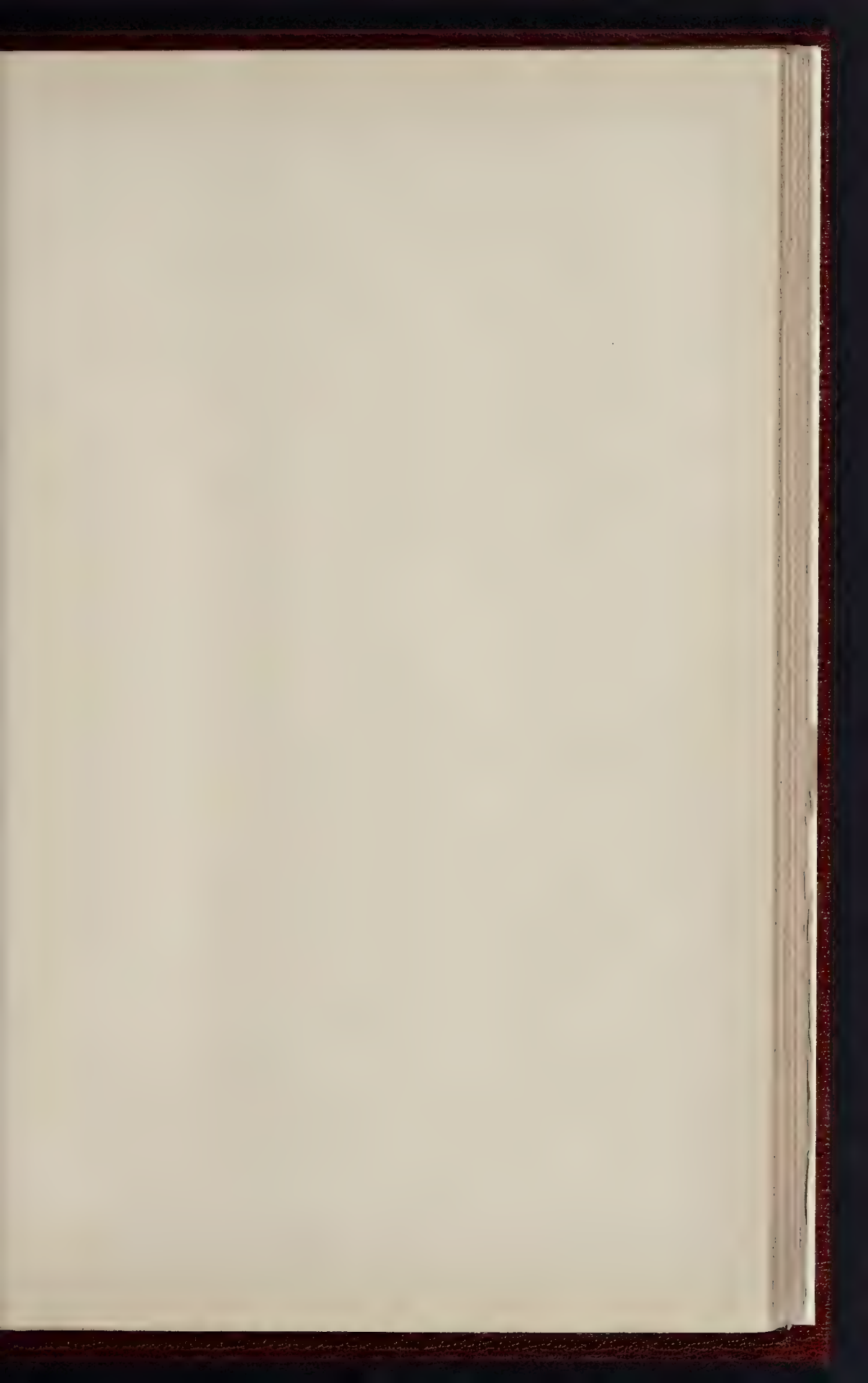


JARDINE HALL, DUMFRIES AS ENLARGED



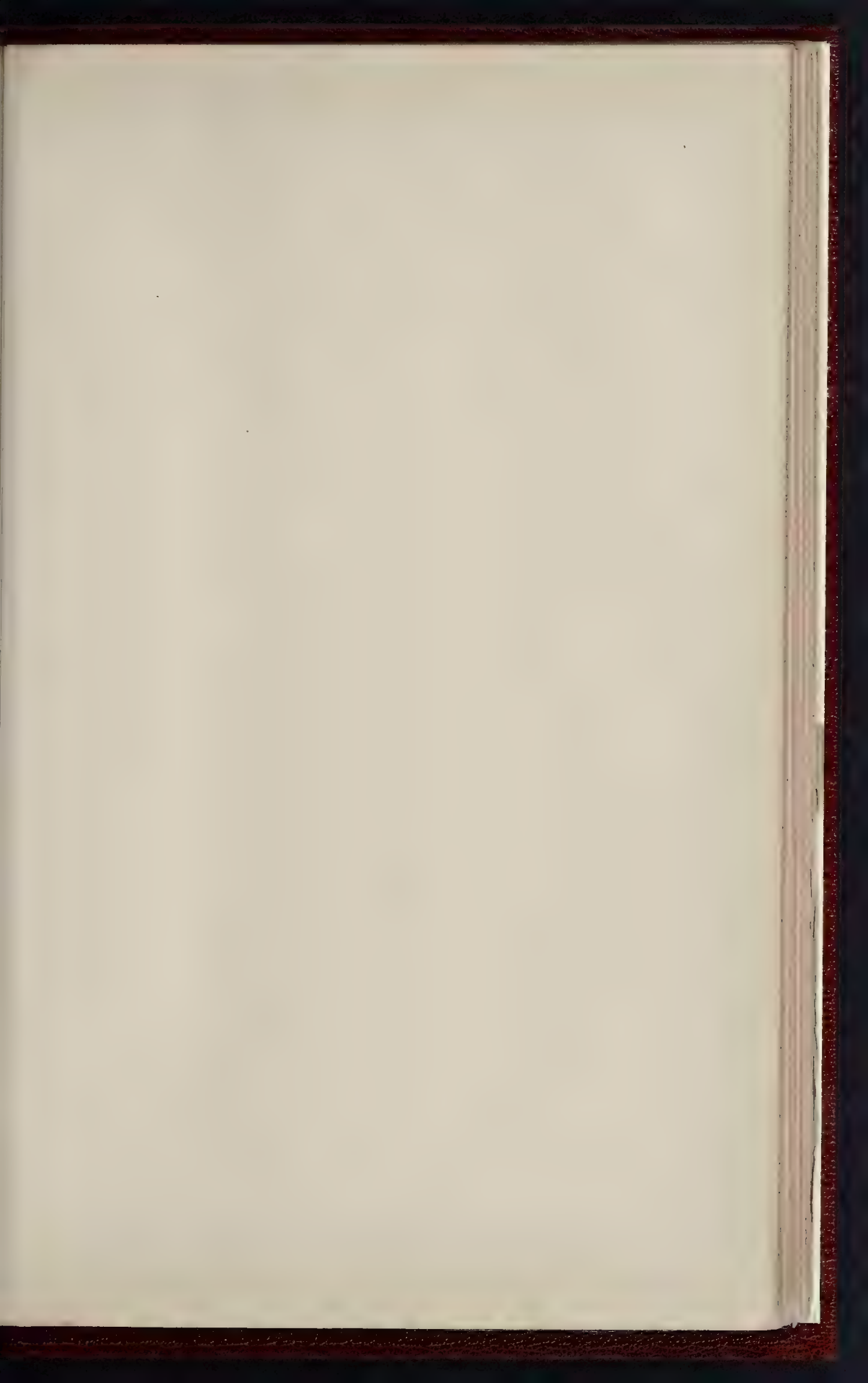
Jardine Hall N.B.
as altered. Entrance Front
E. J. May Architect

INK-PHOTO SPRAGUE & CO. 4 & 5 EAST HARDING STREET SEATTLE, WASH.









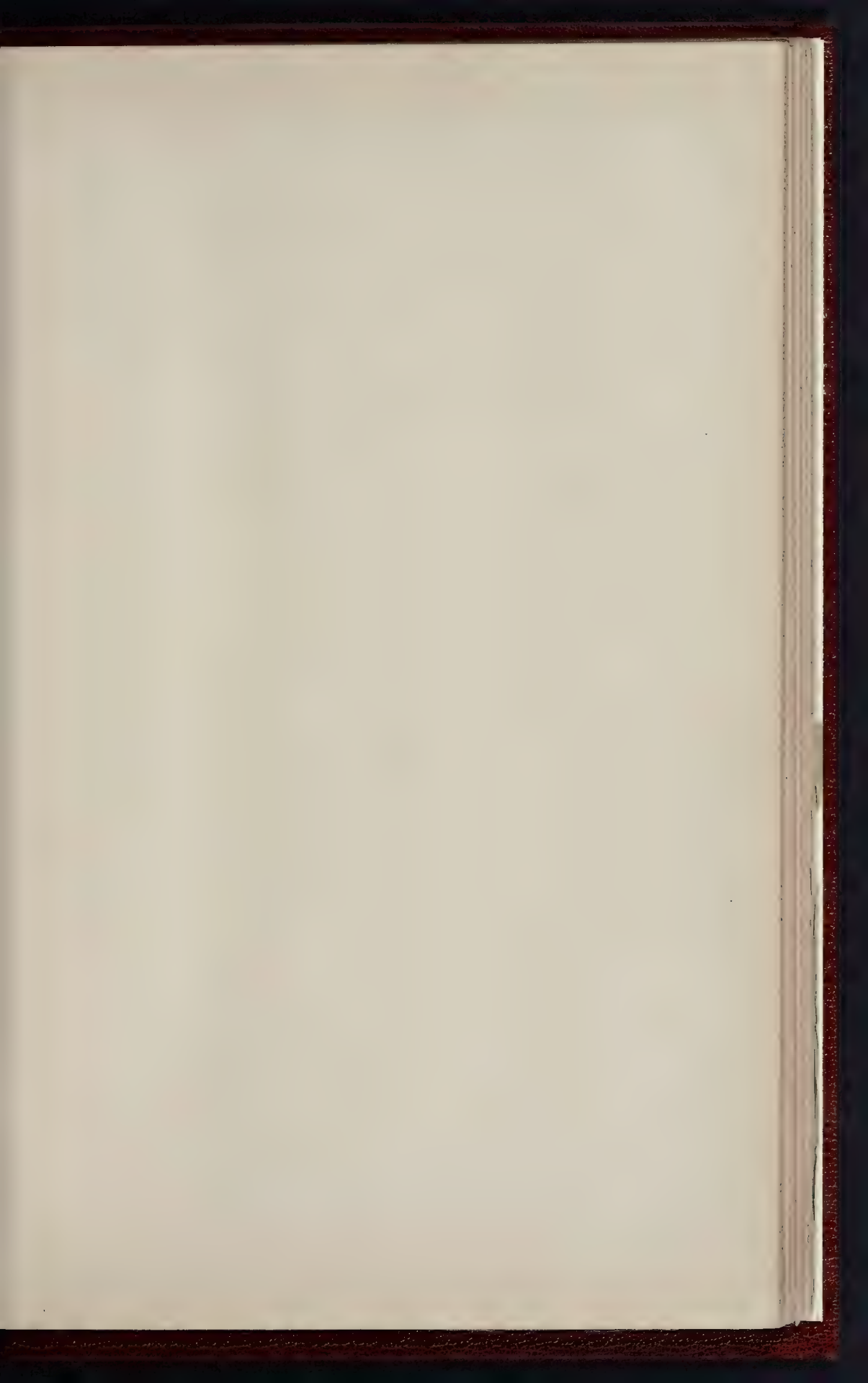


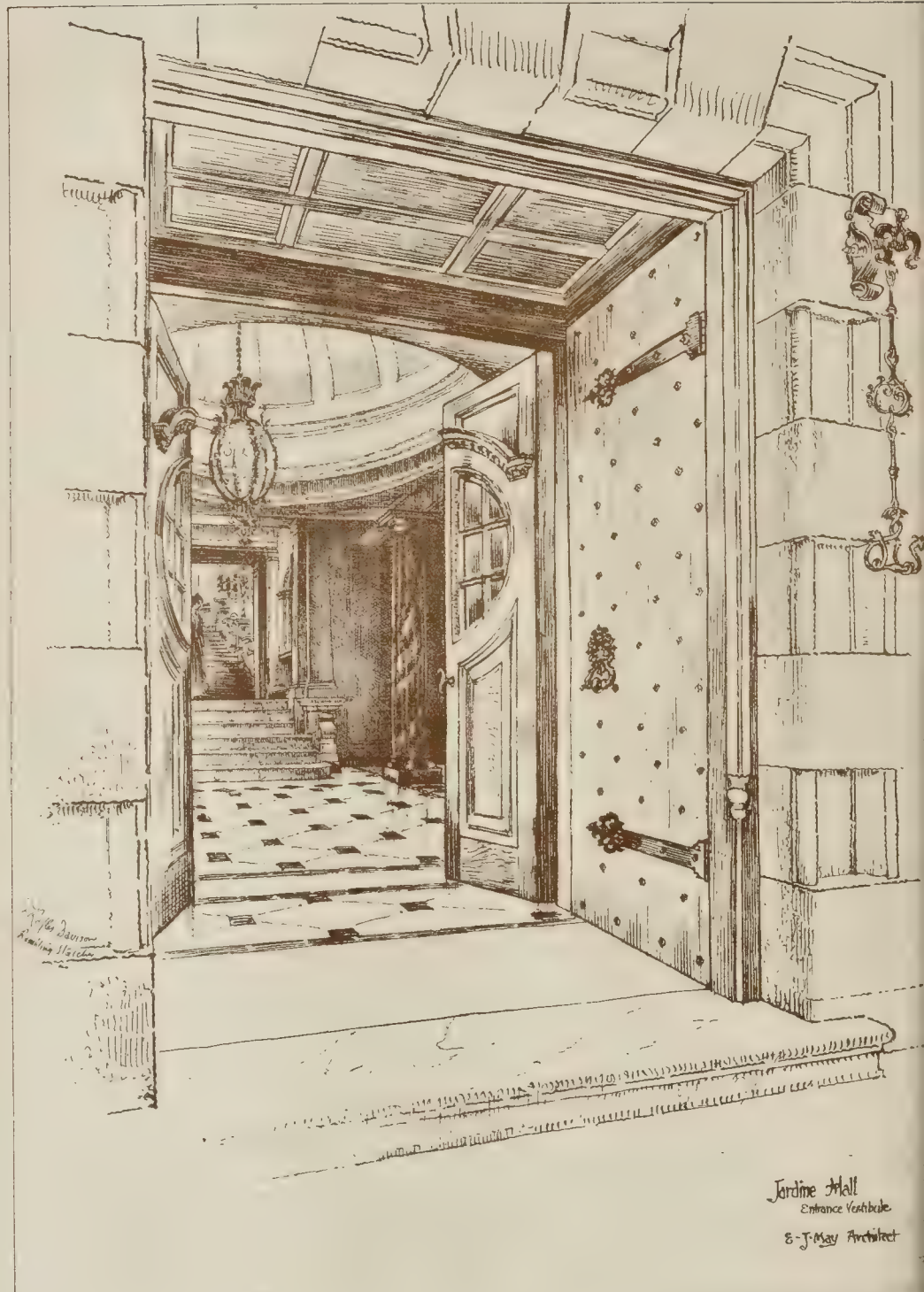
Jardine Hall
Principal Staircase.

E. J. May Architect



Jardine Hall
Entrance Stairs
J. J. May Architect

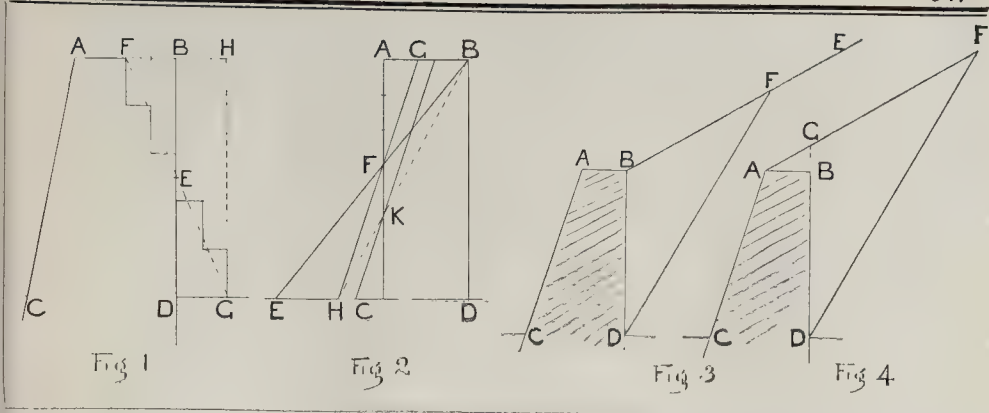




Jardine Hall
Entrance Vestibule
E. J. May Architect



Jardine Hall N.B.
Porte Cachère
E. J. May Architect



domain consisting of a kitchen, a small scullery, and two cupboards, with one ladder at the other end of the building; across the main dining-room having to go across the main corridor. Had it not been for the excellent opportunity the "basement" of this classic type of house offers, the great demand on space that the servants' departments now make would have seriously encroached on the grounds.

The stone used is the well-known red corn-cobble from the quarry on the estate. The woodwork of the lower hall and entrance staircase, with its wall panelling, and the woodwork of the dining-room and corridors is all oak. The principal stairs are in mahogany, which is known to have been seasoning thirty years, and has, probably, been more; and by leaving it unpainted it is now going a deep brown. Mr. Black, the joiner, of Carlisle, deserves great credit for this and all the woodwork. The house is completely supplied with electric light and warmed by hot water. The clerk of works during the latter part of the work was Mr. D. Campbell, of Glasgow.

The work has been carried out on the Scotch system, with a separate contract with each tradesman. The masonry was done by Messrs. J. Halliday & Sons, of Dumfries; the plumbing, sanitary work, and heating by Messrs. P. Drummond & Son, of Moffat; the painting and decorating by Mr. J. Laidlaw, of Lockerbie; and the marble paving, steps, and columns in the Lower Hall by Messrs. Galbraith & Winton, of Glasgow. Specially designed door furniture and locks and hinges, iron grilles, &c., were executed by Mr. Thomas Easley. The lamps up entrance stairs, and in carriage porch, and the bell pull, &c., are by Messrs. Barkenstein & Krall. The locks were supplied by Mr. James Gibbons, of Wolverhampton.

COMPETITIONS.

GLASGOW INTERNATIONAL EXHIBITION, 1901.—At a meeting of the Building Committee of the Glasgow International Exhibition, held on the 26th ult., it was resolved to recommend to the Executive Council that the following professional members of the Building Committee, together with the Convenor and Vice-Convenor, be appointed a Sub-Committee to examine the competitive plans when received and report:—Messrs. J. J. Burnet, A.R.S.A., William Leiper, R.S.A., A. B. McDonald, C.E., W. F. Salmon, James Thomson, and Robert Whithorn.

LORD MAYOR'S ROOMS, TOWN HALL, LEEDS.—The Corporate Property Committee of the Leeds Corporation had before them recently the designs of "White Rose" for the redecorating and refurnishing of the Lord Mayor's Rooms at the Town Hall, to which the first premium was awarded as the best designs. Messrs. Marsh, Jones, & Cribb, of Leeds, were the successful competitors, and the committee propose to use their designs as the basis for the work, which it is expected will cost about £500.—*Leeds Mercury.*

STREET IMPROVEMENTS, LIVERPOOL.—It is proposed to widen and improve Park-road, Liverpool, between North Hill-street and Ellis-place, Oldhall-street, and Leeds-street, Vauxhall-road, from Freemason-row to Marybone, Vernon-street, &c.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XXII.

THE strength of a retaining wall may be considerably increased, without increasing the amount of brickwork and masonry which it contains, by forming the back in a series of offsets instead of building it vertical or straight. The method of arranging the offsets is a very simple one, as shown in our diagram, fig. 1. Suppose ABCD to represent the wall of the necessary thickness to support a given body of earth calculated for a vertical back BD; then, if we bisect BD in E, and draw from AB, through E, any line, FEG; from G draw the vertical line GH; then divide FH into an even number of parts, one less than the number of offsets we propose to use, and BD into the actual number of offsets; then, through the points at which we have divided the lines FH and BD, draw vertical and horizontal lines, meeting, we shall have the contour of the back of the wall arranged in offsets.

The reason for the greater strength with the same amount of material of a retaining wall built with offsets at the back is a threefold one. First, the centre of gravity of the wall is placed further back from the point C, about which the overturning moment occurs. Second, the pressure of the earth is more vertical. Third, the frictional resistance is increased by the fact that the offsets in rising have to lift a considerable portion of the earth. This last point, of course, to be completely effective, demands that the wall shall be strongly constructed, so that the weight of the earth is not sufficient to break the offsets, nor to destroy the coherence of the whole.

In our diagrams of retaining walls, illustrating the points we have considered, we have drawn the external face of the wall with a slightly battered face, and retaining walls are usually built with a battered face, inasmuch as strength for strength the wall with a battered face contains less masonry than a wall with a vertical face. It is an easy matter to change the proposed section of a retaining wall from a vertical face to a battered face, giving the same amount of strength. Thus, if we suppose in fig. 2, ABCD to be the section of a retaining wall of the required strength, with vertical faces front and back, then if we multiply CD by 1.225 and set off DE equal to this product, and join EB, then the triangle BED has the same resistance to overturning as the rectangle ABCD. From this triangle we can arrange our wall with any amount of batter we please. Let us suppose AC is crossed by BE at the point F, and assuming we wish our wall to batter one in three, we should divide AF into three equal parts, and from A set off AG equal to one of them, then join GF and produce this line to meet E in H, then GH clearly batters one in three, but it contains a little more strength than the triangle BED or rectangle ABCD. To arrive at the precise section, we join BH, cutting AC in K, then through K draw a line parallel to GH, which is the face of the wall equal in stability to one with the triangular section BED, or rectangular section ABCD.

In our investigations hitherto, we have assumed

that the earth is level with the top of the retaining wall, but as the earth is capable of forming a bank at some natural slope or angle of repose, the earth is frequently carried up above the level of the retaining wall and sloping back from it in a bank. Such walls are called surcharged walls, and, of course, have a certain amount of increased weight to carry. Now let us suppose, as in fig. 3, that ABCD is a surcharged retaining wall with the earth sloping in a bank BE, from D we draw DF, the slope of maximum pressure meeting DE at the point F. Then the triangle BDF represents the weight of earth, the action of which is tending to overturn the wall by horizontal pressure. If, as in fig. 4, the bank of earth covers the top of the wall, then the weight of earth in the triangle GAB must not be included as exercising an overturning force on the wall, but only the weight of that in the triangle GDE.

In the case of a surcharged wall the point of application of the pressure resultant is not necessarily at one-third of the height of the wall from the base, but is at the point where a line drawn through the centre of gravity of the sustained earth parallel to the slope of maximum pressure meets the back surface of the wall. It is, therefore, usually above the point, which is one-third of the height of the wall from the base.

The theoretical investigations of the strength of retaining walls have usually assumed that the earth at the back of the wall is quiescent and of a determinate angle of repose; but in practice it frequently happens that the angle of repose of the earth is altered by additional moisture, or is disturbed or compressed by weights upon it or by vibration from passing traffic or other causes. These necessarily are indeterminate in their character, and in practical work retaining walls are often built by what we may term rule of thumb, which is on the safe side, but undoubtedly in many cases is superabundant in strength. In this practice the thickness of a wall of dressed stone or coursed stone in good size blocks may be $\frac{3}{5}$ of its height, that of a rubble wall in mortar or a brick wall $\frac{4}{5}$ of its vertical height, and that of a dry rubble wall $\frac{5}{5}$ of its height.

Especially should it be borne in mind that in the construction of wharf walls a considerable increase beyond the theoretical thickness is desirable, notwithstanding that pressure of the water in front helps to sustain them. The earth behind the walls is necessarily often heavily loaded when barges or other vessels are being discharged, and this, of course, adds largely to the pressure on the back of the wall. Then, again, the earth at the back of the wall is frequently saturated with water, and the water often gets under the wall, and by its upward pressure virtually reduces the weight and consequently the stability of the wall. Then, again, when the water does get beneath the wall it becomes partly liable to slide on the wet and soft earth on which it should be resting.

PROPOSED NEW SCHOOL, WEST HARTLEPOOL.—It is proposed to erect a new Board school at West Hartlepool, in the Lister-street district. The cost will probably be about £13,000. Mr. E. Percy Hinde, who designed the recently-erected Brougham school, has been chosen as the architect, and the building will be practically a duplicate of the other one.

OBITUARY.

SIR ROBERT RAWLINSON.—We regret to announce the death of Sir Robert Rawlinson, K.C.B., which occurred on Tuesday afternoon at his residence, 11, The Boltons, South Kensington. Born in Bristol on February 28, 1810, he was the son of a mason and builder carrying on business at Chorley, in Lancashire, and himself began life as a working stonemason. One of his first engagements was with Jesse Hartley, the engineer of the Liverpool Docks, whose office he entered at the age of 21 as a measurer of masonry. But in 1836 he was in the service of Robert Stephenson, acting as assistant resident engineer on the section of the London and North-Western main line at Blisworth. In 1840 he returned to Liverpool as Assistant Surveyor to the Corporation. Sanitary science, as now understood, may be said to be a creation of the last six or seven decades, and in its development and practical application Mr. Rawlinson took a foremost part. On the passing of the Public Health Act of 1848, he was one of the first inspectors appointed, and in this capacity he visited and inspected numbers of towns all over the country. During the Crimean war Mr. Rawlinson was one of the Sanitary Commission sent out to examine into the causes of, and to find remedies for, the unhealthy state of camp and hospital. In 1863 the Home Secretary despatched Mr. Rawlinson and Mr. Farnell to Lancashire to inquire into the feasibility of the Government starting works of "utility, profit, and ornament" in order to provide employment at a fair wage for the starving cotton-workers. After visiting and inspecting over ninety of the principal places, Mr. Rawlinson reported that, in his opinion, a million and a half sterling might be expended in permanent improvements of a beneficial character, such as main sewerage, drainage, forming and completing streets, making new water-reservoirs, and laying out parks and recreation grounds; and in consequence of his statements the Commissioners of the Treasury were authorised to advance out of the Consolidated Fund a sum not exceeding 1,200,000*l.* at 3½ per cent., on the security of the local rates, to facilitate the execution of the public works suggested. Under Mr. Rawlinson's direction success attended the experiment; the men were employed at a wage not less than 12s. a week. In recognition of the services he rendered Mr. Rawlinson was made a C.B. On the constitution of the Local Government Board he became Chief Engineering Inspector, and in 1888, upon retiring from the post which he had held for sixteen years, he was promoted to be K.C.B., having already been knighted in 1883. In addition to his official duties he acted as Chairman of the Royal Commission on the Pollution of Rivers in 1866. He became an Associate Member of the Institution of Civil Engineers in 1848 and President in 1894. We take the foregoing information mainly from the *Times*. We may add, however, that Sir Robert Rawlinson took a great interest in architecture, and in his younger days was a great friend and associate of Elmes, the architect of St. George's Hall, with whom he had an interesting correspondence on the subject of the architectural treatment of the hall, which was subsequently printed.

MR. JAS. R. VEALL.—Mr. James Read Veall, architect, Wolverhampton, died at his residence, Broadwood, Staffs., on the 17th ult., in his seventy-fourth year. Mr. Veall was articled to the late Mr. Wm. Adams, of Wisbech. He went about fifty years ago to Wolverhampton as assistant to the late Mr. Edward Banks, and started in practice on his own account in 1851, carrying out a number of residences, one of the most important of which, St. Cuthbert's, Albion, for the late Mr. Frederic Walton, being illustrated in our pages in the early sixties. The Agricultural Hall, at Wolverhampton, was erected by him, and also the Willenhall Literary Institute, the latter of which we illustrated at the time. Mr. Veall was for some years employed by the Guardians of the Wolverhampton Union, and for some years past the firm of J. R. Veall & Son have been architects to the Guardians of the Cannock Union. The Gas Company's offices in Darlington-street was one of his later works. He erected large warehouses and extensive stabling at Wordsley, and several other buildings of a similar class; also the Church of St. Michael and All Angels, Caldmore, Walsall, and a large number of church schools in the neighbourhood of Wolverhampton. One of his latest buildings was the Victoria Nursing Institute, erected in commemoration of the Queen's Jubilee, which was won in competition in conjunction with his second son, Mr. Ashton Veall, whom he took into partnership about ten years ago. Mr. Veall was, up to the time of his death, one of the Diocesan Surveyors for Lichfield Diocese, for the Archdeaconry of Stafford, and practically carried out the duties to within two or three months of his death.

A NEW SLATE QUARRY COMPANY.—An announcement will be found in our advertising columns of a new company, under the title of the "United Quarries Company," formed to develop the slate quarries in the Nantlle district of Carnarvon. This appears to be an important project, if the worked slate beds in the district acquired prove to be of the high quality anticipated.

GENERAL BUILDING NEWS.

CHURCH, HYSON GREEN, NOTTINGHAM.—On the 19th ult. the new church of St. Stephen's, Robert's Mill-road, Hyson Green, was consecrated. The new church is constructed of Bath stone, and dark red-coloured bricks from Loughborough and Sileby. The internal dimensions are—Length, 110 ft.; breadth, 52 ft., consisting of a nave 24 ft. wide and a chancel. Accommodation is afforded for about 700. There are porches at the west end and on the north and south sides, and also separate entrances for the clergy. The nave is flanked on both the north and south sides by aisles, each 14 ft. wide. The height of the church to the top of the nave roof, which is of open timber, is 45 ft. Owing to the nature of the site, it has been found impossible to have an east window, but the chancel is amply lighted by large traceried windows on both sides. There is a large window at the west end, and others in the aisles and clerestories. The west end has a deeply-recessed porch and large semi-circular windows, divided by a turret, and crowned by a square bell-chamber. A wooden fleche, enriched with panels and tracery, springs from the centre of the nave roof. The church is roofed entirely with red tiles. The building work has been carried out by Messrs. Norris & Sons, of Ascot, from designs prepared by Messrs. Christian, Caroe, & Purday, of London.

PROPOSED CHURCH, SANDYLANDS, MORECAMBE.—A new church is being erected at Cross Cop, Sandylands. Messrs. Paley & Austin, of Lancaster, are the architects. The church consists on plan of a nave of six bays, 76 ft. 6 in. long by 21 ft. wide, and 25 ft. 6 in. high to wall plate inside, with north and south aisles 15 ft. 6 in. wide, and 20 ft. wide; choir and clergy vestries on north side of chancel. At the junction of the nave and chancel with transept there will be a tower and spire, supported by four piers and arches. The height of the tower will be 58 ft. to top of parapet, with a spire. The church is designed in the early Perpendicular style, and will be built of Hathershaw stone throughout, the inside and outside facing being of broken-coursed walling. The roof will be of oak, open timbered, covered with Yorkshire flag slates. The seats and fittings are to be of oak. The portions of the church which are not to be built at present are the north aisle and vestries, south transept, and the chancel east of the tower; also the south porch and the upper portion of tower and spire. The tower will be temporarily roofed over with a pyramidal roof, the turret staircase being temporarily finished with a bell turret of oak and lead. There will be a temporary chancel formed under the tower crossing. The contract for the whole of the work has been let to Mr. John Edmondson, of Morecambe.

ST. SILAS'S NEW CHURCH, BLACKBURN.—This church, which has been erected in Preston New-road, was opened recently. The church will cost about 10,000*l.* when completed. The building, which is in the Perpendicular style, is of stone, and will give accommodation for 600 worshippers. The building is 160 ft. long and 84 ft. wide at the chancel end. The exterior walls are of local stone, with Yorkshire stone dressings, while for the interior walls Runcorn stone is utilised. The piers and pinnacles, with niches, and the chancel walls are of oak, which, with the communion rail, have been carved by Mr. Mills, of Lancaster. The pulpit and font are of Runcorn stone. The carving of the pulpit was done by Mr. Bridgeman, of Lichfield, and that of the font by Mr. Edward Lewis, of Blackburn. Electricity is the illuminant. The architects are Messrs. Paley & Austin, Lancaster, and the contractors were Messrs. Graham & Sons, Huddersfield.

RESTORATION OF SWINTON PARISH CHURCH, YORKSHIRE.—The foundation stone has just been laid in connexion with the restoration of Swinton Parish Church, which was destroyed by fire—with the exception of the tower—last March. The contract for the present restoration was let to Mr. G. H. Smith, builder, Mexboro', for 5,000*l.* The former church accommodated 312 persons. In the new building provision will be effected for 654 persons. The architect is Mr. Isle Hubbard, of Rotherham. The church will be in the Early English style, consisting of nave, north and south aisles, chancel, vestries, and side chapel, with an organ chamber over the vestry. The chancel will be laid in mosaic, with marble terrazzo. The seats will be of oak, and the rest of the woodwork will be of Kauri pine. The church will be built of stone, with a roof of red tiles.

NEW CHURCH, WATERLOO, LIVERPOOL.—The foundation stone of a new church to be erected in Crosby-road, Waterloo, was laid on the 24th ult. The west end of the church will face Crosby-road North. There will be seating accommodation for 800 people. The nave will be 100 ft. long and 30 ft. wide. The aisles will be 74 ft. in length, the transepts 22 ft. square, whilst the chancel will be 42 ft. in width. The interior and exterior walls will be faced with red Accrington bricks and stone dressings. The roof will be 32 ft. to the wall plate, 52 ft. to the top of the ridge, and covered with Tiberlithwaite slates. The architects are Messrs. Grayson & Ould, and the contractors Messrs. Roberts and Robinson, Liverpool.

CHURCH RENOVATION, ST. HELENS.—A meeting of the wardens and sidesmen of the parish church,

St. Helens, was held recently, when it was decided to proceed with the work of introducing the electric light and beautifying the interior of the church, thus completing the restoration of the building, which was begun several years ago. Messrs. Willink & Thicknesse, of Liverpool, have been instructed to prepare plans and designs.

CHURCH AND SCHOOLS, SWSWORTH, LINCOLNSHIRE.—Plans for a new church and schools at SWSWORTH have been prepared by Messrs Eyre & Southall.

WESLEYAN CHURCH, SEAFORTH.—On the 20th ult. the foundation stone of a Catholic church, to be called the Church of Our Lady, Star of the Sea, was laid at Seaforth. The church is to be erected on a site at the corner of Church-road and Crescent-road. The architects are Messrs. Sinnott, Sinnott, & Powell, Liverpool, the contractor being Mr. W. Winnard, of Wallgate, Wigan.

WESLEYAN CHURCH, COVENTRY.—A Wesleyan church is to be erected in Coventry at the corner of Stoney Stanton-road and Eagle-street. The existing church will be converted into Sunday schools when the larger erection is completed. The new church will have a frontage to the Stoney Stanton-road of 70 ft., and to Eagle-street of 77 ft. The main entrance will face the Stoney Stanton-road, and the tower, which with the present church the tower will be situated. Seating accommodation is to be provided for rather more than 700 adults on the ground floor and gallery. A choir and organ space is provided on the ground floor, and also vestry accommodation, three of these apartments being included. The building will be constructed of red brick with Hollington stone dressings, with green slates for the roofs. The tower, which with the church is 20 ft. high, is to be also of red brick with stone dressings, and the spire will be made of stone. The internal woodwork will be of pitch pine, and the roof, which is to be open boarded, will be unvarnished. The heating apparatus is on the low pressure hot-water system, with radiators, the heating chamber being placed under one of the vestries, in the basement. The cost of the church is 2,000*l.* Messrs. Harrison & Hatfield are the architects, and Mr. C. Garlick, jun., is the contractor.

BAPTIST CHURCH, NORTHAMPTON.—A new Baptist church is to be built at Northampton on a site in Adnitt-road, exactly opposite Allen-road. The school will be on an adjoining site, with a frontage in Len-road. A number of architects were invited to prepare plans, which were adjudicated upon by a London assessor, who selected the designs sent in by Messrs. Mosley & Anderson, of Northampton. The main building consists of nave, with transepts, and with an aisle on either side. The aisles have lean-to roofs. The nave is lighted, not only with the windows in front, but from the windows in the half-timbered clerestory. There is an entrance vestibule in front. The rostrum is the opposite end. The baptistry is immediately in front of the rostrum. Behind, separated from the church proper by an internal passage, are the vestries. The tender of Mr. A. P. Chown for 1,475*l.* has been accepted. The church will accommodate about 450 worshippers.

BIBLE CHRISTIAN CHURCH, BRIGHTON.—The new Bible Christian Church, Stanford-avenue, Brighton, was opened on the 18th ult. The building consists of a nave and two wide transepts, and an apsidal end. The external walling is of stock bricks with dressings of red bricks and Sussex stone; the roofs are covered with slates, and are surmounted at the crossing of the transept roofs with a ventilating turret. The church is placed over a schoolroom. In the rear are vestries, which are approached by a private staircase, and have also an entrance from the church to the schoolroom, which forms a second exit from the church, this staircase being fireproof. The schoolroom proper will seat about 300, but there are four class-rooms divided off by patent swivel partitions, which can be thrown back, thus adding space for another sixty. There is an infants' room will hold some fifty children; and there is also a young women's class-room, accommodating about thirty, and a kitchen and boiler, sink, &c. The heating is by hot-water pipes to the schoolroom and class-room, and by radiators to the church. The buildings are lighted with electric light throughout. Mr. E. J. Hamilton, Brighton, was the architect, and Messrs. Saunders & Sons the contractors.

PRIMITIVE METHODIST CHURCH, MORLEY.—A new Primitive Methodist Church and Sunday school at the Birks, Morley, have just been opened. The premises have been built at a cost of 1,600*l.*, from designs prepared by Mr. T. A. Buttery, Morley, and accommodation is provided in the church for 250 adults, and in the schoolroom underneath for 300 scholars.

REOPENING OF HULL BETHEL CHAPEL.—The Bethel Chapel (Methodist New Connexion), Charlotte-street, Hull, has just been reopened. The work of renovation has been carried out under the superintendence of Mr. Percy T. Runtun, the various contractors being Messrs. George Houlton, R. Finch, Russell, and Healey. Mr. Woods has fitted the electric light. The work, which includes the building of a new organ, is to cost from 1,000*l.* to 1,200*l.*

NEW FREE CHURCH, CRAIGMILLAR PARK, EDINBURGH.—The memorial stone has just been laid of the new Craigmillar Park Free Church, a site for which has been secured at the end of East Sutherland-

road, Edinburgh. The plans have been prepared by Messrs. Sydney Mitchell & Wilson, architects, Edinburgh. The church is cruciform on plan, and consists of a nave, aisles, transepts, and a semi-octagonal apse. The nave, with spire, is at the north-west corner, and is the main entrance is placed. The vestibule between the doorway and the church is spacious. Over it is placed a western gallery. The nave is divided into three bays by circular columns, with moulded capitals. The clerestory windows, of which there is one over each bay, are of three lights. The aisles are used entirely as passages, and contain no seats. The apse is separated from the church by a stone arch, and it is lighted by three windows with tracery heads. A panelled dado is carried round the apse, and its floor, which is raised three steps, is laid with encaustic tiles. On the north side of the apse, and opening into both it and the north transept, by means of stone arches, is the organ chamber. The roof of the apse is treated as a semi-dome, and is lined with wood and decorated with moulded ribs of the same material. The roof of the nave and transepts is open timbered. Behind the church the usual accommodation in the way of vestry, session-house, ladies' room, &c., is provided. The hall is a complete octagon, with a row of low, mullioned windows on each of its sides. The tower is square in plan, and is designed without buttresses. The church is seated for over 700, and the hall for nearly 300.

WELSH BAPTIST CHURCH, ANGLESEY.—This building has been erected at Llanelgell as a memorial to the Rev. Christmas Evans. The approximate cost of the building was 2,000l. The designs were furnished by Mr. Evan Evans, Carnarvon, and the works carried out by Messrs. R. & J. Williams, Upper Bangor.

WELSH BAPTIST CHURCH, NEW SKELTON, MIDDLESBROUGH.—The foundation stones of a new iron church, to be erected for the Primitive Methodist Connexion at New Skelton, were laid recently. The plans were prepared by Mr. W. Wardman, architect, Redcar.

CUNNINGHAME FREE CHURCH, GLASGOW.—On the 28th ult. the memorial stone was laid of the new Cuninghame Free Church, which is being erected at the corner of Govan and Thistle Streets. The new buildings will accommodate 870, but there are three suites of halls and rooms to accommodate as many as the church. The buildings are to cost 7,000l. The plans are by Messrs. H. & D. Barclay, architects; and the contractors are: J. Adam & Co., masons; A. Niven & Son, Wrights; J. MacFeat, plumber; Jas. Merchant, slater; J. Drummond, plasterer; and Trench, Sons, & Cross, gasfitters; with Mr. Charles Wilton as clerk of works.

WESLEYAN CHURCH, CHURCH GRESELEY, DERBYSHIRE.—The new Wesleyan church at Church Greseley was opened on the 27th ult. Mr. Robert C. Clarke, of Nottingham, was the architect. It is a structure of red pressed bricks, with buff terracotta dressing, and will provide accommodation for 400. The contractor who has carried out the work is Mr. Charles Venning, Swadlowcliffe.

CUNNINGHAM NEW SCHOOL, SOUTHPORT.—The new schools which have been erected on the site of the old Christ Church Schools, Southport, have just been opened. The basement contains chamber for heating apparatus and tea boilers, also a scullery, with hoist up to the top floor, and store-rooms. The ground floor school contains a central hall, 54 ft. long by 22 ft. wide, with a row of windows on each side, 22 ft. by 22 ft.; and an infants' room (with gallery), 21 ft. by 20 ft.; also a hat and cloak room, with lavatory. There is accommodation on this floor for 250 scholars. When the sliding doors are moved aside, and the revolving shutters raised, a hall is provided, with seat room for about 600 persons. A recreation ground has been provided on this level. The First Floor School is reached from the ground floor by two iron staircases. It is arranged with a central hall, 45 ft. long by 24 ft. wide, and with an average height of 25 ft. On each side are two class-rooms. There is accommodation on this floor for 300 scholars. Separate hat and cloak rooms, with lavatories, are provided for the upper school-rooms. There are also a teachers' room on this floor. The Parochial Hall: The central hall and class-rooms are formed by a system of sliding doors and revolving shutters. These can all be removed in the course of a few minutes, so as to form a large hall, 50 ft. by 40 ft., and capable of holding over 800 people. Sunday School: Each of the six large class-rooms can be subdivided, so as to form twelve class-rooms for Sunday school purposes. On the second floor is a room for manual instruction, 40 ft. long by 22 feet wide, capable of accommodating fifty or sixty scholars. Opened out of the three store-rooms. On the same floor is an open playground, 44 ft. by 22 ft., with all necessary offices. Also the head-master's room, with store-room and lavatory. All the rooms and landings throughout are heated with hot-water pipes and radiators, on the low pressure system. Fresh air is obtained through a hopper arrangement, the bottom part of each window, and the foul air is taken away by flues in the walls and 9 in. diameter pipes in the ceiling, all connected with a large air pump extractor fixed in the roof. The halls, class-rooms, vestibule, and staircases are lit with the electric light; gas light is also provided in case of need. The staircases, and the school, school proper, and are constructed entirely of iron. The

landings are constructed of steel joists and concrete. There are eight entrance doors into the principal parts of the school building, and these are all made to open outwards. The school buildings have been erected from the designs of Mr. Goodwin S. Packer, Southport.

WILLS' MEMORIAL SCHOOL, WADEBRIDGE, CORNWALL.—The foundation stone of a Methodist school, to be erected as a memorial to the late Mr. S. Wills, was laid recently. The building adjoins the Wesley Chapel in the Egloskylle-road, and will be attached to the present school-room by means of a covered way. It is intended to accommodate 350 children. The plans were prepared by Messrs. Kerley & Ellis, of Exmouth, and the building is being erected by Mr. T. Williams, of Wadebridge.

WESLEYAN SCHOOLS, ACCRINGTON.—Memorial stones were laid recently of a new Wesleyan primary and Sunday school at Spring Hill, Accrington. The building is estimated to cost 4,500l. The architect is Mr. H. Ross, of Accrington.

ADDITIONS TO TURRIFF PUBLIC SCHOOL, N.B.—A commencement will shortly be made with additions to the Turriff Public School. The west wing is to be extended to the same length as the east wing, and on the ground floor two cloak rooms, 25 ft. by 15 ft., are to be provided. The present rooms under the centre floor are to be converted into a hall of 55 ft. by 21 ft. At the back of the hall a staircase will run up to the first floor. On the ground floor two infant rooms will be fitted up to accommodate 182 pupils. In each of the standard rooms about eighty pupils are accommodated, while the additional two class-rooms will give about thirty-two places more in each room. On the first floor board room and retiring rooms for the teachers are to be provided. The plans for the reconstructed building have been prepared by Messrs. James Dundee & Co., architects, Turriff. The estimated cost of the alterations and additions is 2,480l.

NATIONAL SCHOOL, LLANGEDWYN, DENBIGHSHIRE.—The new National Schoolroom which has been erected at Llangedwyn was opened on the 24th ult. The architect was Mr. D. Williams, and the work was carried out by Mr. R. A. Jones, Llangefyllin. The building is of Ramon pressed bricks, with freestone dressings.

SCHOOL, NEATH.—At Melicerythan, recently, the foundation stone of new schools was laid on a site on the Eaglesbush estate. The contract price of the new buildings is 5,400l. Accommodation is to be provided for 618 scholars. The architect is Mr. E. Rees, and the builder is Mr. A. George.

NEW WING, WEST KENT GENERAL HOSPITAL, MAIDSTONE.—A new wing of the West Kent General Hospital, added thereto by public subscription in commemoration of the Diamond Jubilee of her Majesty the Queen, has just been opened. The entrance to the new buildings is from the Queen Anne-road, by a large porch leading to the waiting hall—a room 39 ft. by 22 ft., with an extension at right angles 35 ft. by 12 ft. Opening from the waiting hall are the three consulting-rooms, for the physician, surgeon, and dental surgeon, and on the opposite side is a dispensary, with a room for stores opening from it. A corridor leading from one end of the hall communicates with that connecting the children's ward and nurses' home with the main block. A porter's room, with scullery attached, has been included in the scheme. The old waiting hall has been utilised for a board room and a room to be used as a library, museum, and for the use of the medical staff. The chapel, 30 ft. by 18 ft., is approached from the landing adjoining the women's ward. The buildings—the design of Mr. H. Bensted—have been built by Mr. T. Elmore.

VICTORIA HOSPITAL FOR INCURABLES, DUNDEE.—Plans for this building, prepared by Mr. J. Murray Robertson, architect, have just been approved by the Works Committee of the Town Council.

MANSE, NAIRN, N.B.—Competitive plans for a parish church manse, Nairn, were invited from three architects in the north, and at a recent meeting the plan by Mr. John Mackintosh, Inverness, was adopted.

FORESTERS' HALL, RYDE, ISLE OF WIGHT.—The new Foresters' Hall in Warwick-street, Ryde, built by Mr. Isaac Barton from the designs of Mr. John I. Barton, at a cost of some 2,000l., has just been opened. The building is of red brick, with Bath stone dressings. On the south side is a square of 20 ft. The roof is tiled. The large hall is 85 ft. long, 36 ft. wide, and 26 ft. high, and has a gallery at the end. There is also a kitchen and scullery, heating chamber, and other offices.

PARISH HALL, WANSTEAD SLIP, ESSEX.—The foundation stone has just been laid of a Parish Hall at Wanstead Slip, the site is in Janson-road, close to the church. The building is being erected from the plans of Mr. T. Warren by Messrs. Holloway, of Battersea. It will contain two halls, one on the ground floor and another on the first floor, besides other rooms.

AN OLD INN AT ALNWICK.—Plans were passed by the Alnwick Magistrates recently for the rebuilding of "Ye Old Plough Inn," in Bondgate Without, Alnwick. The building will consist of three stories. The plans were prepared by Mr. Hope, architect, of Newcastle-on-Tyne.

WORKING MEN'S CLUB, KIRKMICHAEL, N.B.—The foundation stone has just been laid of this building. The architect of the club is Mr. J. S. Baxter,

Dalrymple, and the accommodation consists of recreation room, kitchen, parlour, and bowl house on the ground floor; a hall to accommodate 300, and two ante-rooms on the second floor; with a lower and turret for a clock. The building will be of Ballochmyle stone throughout.

INSURANCE OFFICE, BIRMINGHAM.—The Norwich Union Fire and Life Assurance Societies have just entered into possession of the building at the corner of Congreve-street and Edmund-street, which was erected for the Birmingham Liberal Club, and which will now serve as the company's head office for the Midlands. King Edward's Girls' High School, pending the erection of a building in New-street, occupied a portion of the premises; and a short time ago the Norwich Office purchased the building for 40,000l., and placed it in the hands of the original architects, Messrs. Gossins, Peacock, & Bewley, and the original builders, Messrs. W. & J. Webb, for adaptation to commercial purposes. The ground floor contains the public department of the office. A new Gothic doorway, with stone mouldings in the style of the other arched work of the exterior, has been constructed in Congreve-street. The Fire Department on the left of this entrance, and with a frontage to Edmund-street, has been formed out of the old reading-room of the club, the inner partition wall having been arched and a counter placed along the line of arches. The counter on the right bounds the Life Department, formerly the old entrance-hall and lounge. A small portion of the fire office has been partitioned off by a screen of oak and leaded cathedral glass to form a private office, and similar devices have been adopted in other parts of the building where division has been necessary. The large dining-room has been divided by oak-and-glass screens. Strong-rooms and store-rooms have been constructed in the basement, and the upper rooms have been fitted up as offices. The staircase has been slightly altered, and the old Congreve-street entrance will serve for the let-off portion.

PRESBYTERIAN CHURCH, NEWCASTLE.—The Erskine Presbyterian Church, Ryehill, Newcastle, was opened on the 25th ult. The new church has been erected on the site of the old Erskine church, from the designs of Messrs. Badenoch & Bruce, and has accommodation for 500.

PROPOSED LUNATIC ASYLUM, RADCLIFFE, NOTTINGHAM.—Colonel W. B. Slake, R.E., held an inquiry on the 25th ult. at the Shire Hall into the application of the Nottingham County Council for sanction to borrow 110,000l. for the purpose of erecting a lunatic asylum at Radcliffe. Mr. E. P. Hooley, the County Surveyor, is the architect for the new asylum.

SWIMMING BATH, HARROGATE.—A new swimming bath at Harrogate is being erected on the Dragon Estate on Skipton-road. The architects of the building were Messrs. H. E. & A. Brown, of Harrogate. The estimated cost of the buildings, land, and furnishings is 5,500l. The dimensions of the swimming bath are 75 ft. by 30 ft.: it is formed of glazed brick walls, white tiled bottom, with black tiled partitions. There are forty-two dressing-boxes, over which is a gallery on three sides of the building. The gallery, which is intended specially for spectators, will accommodate upwards of 250. In the front portion of the building, on the right of the entrance, is a billiard-room for two tables. On the left, a refreshment room, with a bar, is arranged. A ticket-office is fixed in the front entrance. Over the entrance a board-room is provided for the directors, and living-rooms, &c., for the caretaker, and store-rooms. The contractors for the new baths, &c., are:—Mason and bricklayer, Mr. S. Nettleton, Billon; joiner, Mr. J. W. Rudd; engineering, Mr. J. Robinson; plumbing, Mr. Chris. Allen; painting, Messrs. Jessop & Cosgrove; and plastering, Messrs. Fortune & Calverley.

COURT-HOUSE, CASTLEFORD, YORKSHIRE.—The new Court-house for Castleford has just been opened. In designing the building, the West Riding Surveyor (Mr. Vickers Edwards) has adopted the Elizabethan style. Entering a lobby by the main door in front, a turn to the right brings the visitor into the charge-room. Opening into the charge-room is the inspector's office. A corridor extends the entire length of the basement, and into this corridor, to the rear, opens a range of five prisoners' cells. From the corridor direct access is obtained by a back staircase, to the dock in the magistrates' court above. From the lobby a stone staircase leads to the upper story of the building. On the landing to the right are the magistrates' clerks' rooms and a short corridor, into which the witnesses' room opens. At the end of the corridor folding-doors give admission to the magistrates' court. At the rear is a gallery for the general public, affording sitting accommodation for about a hundred people. The magistrates' room is on a level with the court. The whole of the work has been carried out by Messrs. Denholm & Co., of Wakefield, Mr. France was clerk of works, and the cost has been about 7,000l.

CLUB, LEEDS.—The foundation-stone of the new club-house in St. Peter's-square, Leeds, in connexion with the Good Shepherd's Mission Church of the Parish Church, was laid on the 28th ult. On the ground-floor there will be a billiard-room and reading-room, comprising the recreation club, and above, similar rooms will form the men's club. At the south end of the block will be the bagatelle and

reading rooms of the boys' club. The building is designed by Mr. H. Chorley, of the firm of Messrs. Chorley, Connon, & Chorley, architects, Leeds. The contractors are Messrs. J. T. Wright, J. Tomlinson & Son, E. Tattersall, J. P. Mountain & Son, F. Woodhead, and Teale & Somers.

IMPROVEMENTS AND ADDITIONS TO LINCOLN CORN EXCHANGE.—Various works of improvement are being carried out on these buildings, from plans prepared by Messrs. W. Watkins & Son. The contract is being carried out by Messrs. Wright & Sons.

BANK, ELSWICK.—A new bank is in course of erection at the corner of Beech Grove-road and Elswick-road. The contractors (Messrs. J. & W. Lowry) are building the premises from plans by Mr. J. W. Dyson.

BUILDING IN GLASGOW.—There were ninety-nine cases brought before Lord Dean of Guild Graham and the members of Glasgow Dean of Guild Court on the 26th ult., the applications for linings representing 273,000l. of new property. One of these was for the erection of a building in the centre of the city 92 ft. in height, and the other for a building 110 ft. in height. Mr. John Whyte, the Master of Works, objected to both plans, maintaining that their great height would be very dangerous in the event of an outbreak of fire, as the pressure from the mains would not raise water higher than 73 ft. The plans for the lesser building were passed, but consideration of the other plans was continued for a fortnight.—*Glasgow Herald.*

CITY-SQUARE IMPROVEMENTS, LEEDS.—The new lavatories for men and women were opened to the public on the 28th ult. The whole of the fittings have been prepared from special designs, and have been carried out in glazed fireclay and earthenware by Messrs. Doulton, Twyford, and the Farnley Company. The walls and arches are lined with cream-coloured glazed bricks, with a dado of coloured glazed bricks. The faience work in the arches, &c., carrying the deck lights, has been carried out by Mr. Whitehead. The mosaic floors have been laid by Messrs. De Grelle Houdret & Co. The joiners' work is executed in teak, and varnished. The whole of the lavatories are lighted by electricity. The ventilation is carried out by Blackman's electric fans, and is designed to change the whole volume of the air four times every hour. The women's lavatories are designed with private dressing-rooms, &c., which are fitted up with every modern convenience. This is the first attempt to provide first-class accommodation in these lavatories for the public. The granite work in connexion with the City-square improvements has been carried out by Mr. James McIntosh, of Aberdeen. The whole of the works have been designed and carried out under the superintendence of Mr. William Bakewell, Architect for the Corporate Property Committee, Leeds. Mr. Henry Whiteley has acted as clerk of the works.

SANITARY AND ENGINEERING NEWS.

CRICH WATER SUPPLY, DERBYSHIRE.—A few months ago the Belper Rural District Council invited competitive schemes for supplying the parish of Crich with water—a district containing about 3,000 population. Ten schemes were submitted, engineers from London, Brighton, Birmingham, and Yorkshire competing. The Council decided that the scheme submitted by Mr. Harry W. Taylor, of Newcastle-upon-Tyne, was the most suitable, and this was accordingly adopted. Mr. Taylor has been engaged as engineer for the execution of the work.

PUBLIC IMPROVEMENTS, NOTTINGHAM.—Col. W. R. Slacke, R.E., held an inquiry on behalf of the Local Government Board at the Guildhall, Nottingham, on the 24th ult., into the application of the City Council for sanction to borrow 51,500l. for works of sewerage, 5,040l. for purposes of public baths, 3,000l. for the provision of a depot at Bulwell, and 800l. for purposes of street improvement. On behalf of the Council there attended the Town Clerk (Sir S. G. Johnson), the City Engineer (Mr. Arthur Brown), the deputy city engineer (Mr. F. B. Lewis), and others.

LANGPORT, SOMERSET.—The Rural District Council have accepted a tender from Messrs. Alfred Wills & Sons, of Bath, for the construction of a reservoir and other works for supplying water to Westport, Hambridge, and Barrington. The scheme has been designed by Messrs. Bailey-Denton, Son, & Lawford, of Westminster.

PONTOON FOR STETTIN, GERMANY.—What is claimed to be the largest pontoon in the world has just been launched from the shipbuilding yard of Messrs. Swan & Hunter, Limited, Wallsend. The pontoon, which has been built to the order of the Vulcan Shipping Company, Stettin, to which port it will be towed, is 510 ft. long, 110 ft. wide, and 42 ft. 6 in. high, and its lifting power is put down at 11,000 tons. This weight can, however, be increased by tower auxiliaries similar to those introduced in the case of the large pontoon recently built by Messrs. Swan & Hunter for the Spanish Government. The sub-contractors for the machinery are the Wallsend Slipway and Engineering Company, Limited, who are responsible to the builders for a complete installation of machinery suitable for working the dock. The engines and the pumps were made by Messrs. Gwynne & Co., of Holborn, the valves by Messrs. Blakeborough, of

Brighouse, and the boilers by Messrs. Riley Bros. of Stockton. During its construction, in addition to the supervision of the designers, Messrs. Clark & Standfield, Westminster, the dock has been under the personal supervision of Mr. Otto Haack, one of the assistant managers of the Vulcan Company.

MUNICIPAL WORKS, BIRMINGHAM.—Mr. G. W. Willcocks, one of the Inspectors of the Local Government Board, conducted an inquiry at the Council House, on the 17th inst., relative to an application by the Corporation for power to borrow moneys amounting altogether to 38,000l. for the purpose of carrying out various municipal works—27,200l. for street improvements, 4,610l. for sewerage, 2,500l. for the purchase of the leasehold interest in certain land for market purposes, 600l. for payment to the Great Western Railway Company in respect of the widening of Musgrave-road and Bacchus-road bridges, 600l. for the diversion and covering in of the Spark Brook near Golden Hillock-road, 500l. for the provision of additional stabling at Harborne Wharf, and 2,000l. for purposes in connexion with the laying out of Harborne Recreation Ground. There was no opposition to the various proposals.

STREET IMPROVEMENTS, &C., ILFORD.—Mr. H. P. Boulnois, M.Inst.C.E., Local Government Board Inspector, recently held an inquiry into the application of the Ilford Urban Council for sanction to borrow 12,350l. for works of public street improvement and surface water drainage; 1,385l. for private street improvements; and 700l. for the provision of a new drainage in connexion with the Broadway.—Mr. H. Shaw, C.E., Surveyor, said that last year new streets to the extent of 13 miles 1,002 yards were laid out.—There was no opposition to the application.—The Inspector afterwards visited the various roads.

THE RECONSTRUCTION OF REGENT BRIDGE, ABERDEEN.—A meeting of the Works Committee of the Aberdeen Harbour Board was held on the 10th inst. to consider the report of Mr. Nicol, Harbour Engineer, on the reconstruction of Regent Bridge. Mr. Nicol's estimate brings the total cost of the whole works up to 49,700l. The committee approved of the plans.

WATER SUPPLY, TATSFIELD, SURREY.—The Rural District Council of Godstone have instructed Messrs. Bailey-Denton, Son, & Lawford, of Westminster, to report as to the best means of providing an efficient water supply for the parish of Tatsfield.

STAINED GLASS AND DECORATION.

WINDOWS, BURGHWALLS CHURCH, YORKSHIRE.—Two new stained-glass windows, recently placed in Burghwalls Church, have just been dedicated. One window is in commemoration of the Queen's Jubilee. The windows were supplied by Messrs. J. Powell & Sons, London.

ROOD SCREEN, &C., DOWN AMPNEY CHURCH, GLOUCESTERSHIRE.—A rood screen has been placed in Holy Trinity Church, Down Ampney, and other additions internally have been made to the church. The rood screen and the other additions are from the design of the architect, Mr. Chas. E. Ponting, F.S.A., of Marlborough. The screen has been erected immediately beneath the chancel arch, and now marks the line of demarcation between the nave and chancel. It consists of three bays on either side of the doorway. These are carved above, and have their lower panels filled with tracery. Each bay has an ogee head with carved crockets, terminating with *fleur-de-lis*, and surrounded by a pierced tracery. From moulded caps springs the traceried groining which runs the whole length of the screen, both on the eastern and western sides. Between the bays are ornamented springers, finishing with sculptured heads. Above the groining an inverted cresting marks the commencement of the main cornice, and upon the latter there are carved symbolical ornaments, interspersed by carved angels in devotional attitudes, surmounted by a pierced cresting through which run buttressed pinnacles supported by angels holding shields whereon are carved emblems of the Passion. Above the whole rises a rood cross. On the eastern side of the screen much carved work is introduced. The screen is made entirely of oak. The reredos is fixed upon a re-table of Hopton wood marble, the mensa of the altar also being of the same material. The reredos proper is composed of oak. The central panel consists of a representation of our Lord crucified, with the Blessed Virgin and St. John standing at the foot of the cross, all in high relief. In niches at the sides are a quartette of angels, and in the roundels, the whole surmounted by a carved canopy. The north side of the reredos is occupied by carved figures of the four great Virgins of the Latin Church, viz., St. Cecilia, who is shown with the organ as her emblem; St. Agnes, with the lamb; St. Agatha holds the shears; and St. Lucia bears aloft a lamp and carries a palm. In the south compartment are the four Latin Fathers, Jerome being habited in the hair and robes of a cardinal, bearing a Church in his hand; St. Ambrose wears the episcopal robes as Bishop of Milan, with mitre and crozier, and holds a knotted scourge; St. Augustine is also habited as a Bishop, and carries a book; and St. Gregory is in pontifical robes with a dove hovering above his head. The supports of the reredos are composed of gesso panels of gold orna-

ments. The whole of the sanctuary has been paved with marble. The church has been seated throughout in oak, as also have the side chapels. The south chapel has been enclosed with screens, the altar foot pace laid with marbles and the old tombs restored. The whole of the work has been carried out from the designs and under the direction of the architect by Messrs. Harry Hems & Sons, Exeter.

MOSAIC PAVEMENT, ST. CUTHBERT'S CHURCH, DARLINGTON.—The marble mosaic pavement which has been placed in the sanctuary of St. Cuthbert's Church was dedicated a few days ago. The pavement was designed by Mr. J. P. Pritchett, architect, the idea being taken from the "Divine Commedia" of Dante. A white marble slab let into the floor bears an inscription.

WINDOWS, ST. ANNE'S, EDGEMORE IN ROSSENDALE, LANCASHIRE.—Three stained-glass windows have just been unveiled in this church, in the chancel. They are from the firm of Messrs. Heaton, Butler, & Bayne, London.

DECORATION, &C., OF SCARBOROUGH UNITARIAN CHURCH.—This church has just been reopened, after having been closed for some weeks. The church has been cleaned and painted, a new organ erected, and the electric light installed. In addition to this, some fresco decorations have been painted upon the end wall, each recess or niche containing a figure in outline and colours upon a dull gold background. The figures are illustrative of the cardinal virtues, Faith, Love, Hope, Peace, &c., and each is surrounded by suitable ornaments. The work has been executed by Messrs. Powell Brothers, Leeds, under the supervision of Mr. Connon, architect, of Leeds.

WINDOW, GERMAN CHURCH, BRADFORD.—A stained-glass window has been presented to the German Church at Bradford by Mr. Delius. The subject is from the picture by Holmann, "Where two or three are gathered together in My name," &c. Messrs. Powell Bros., of Leeds, executed the work.

FOREIGN.

FRANCE.—M. Eugène Guillaume, the sculptor, has been elected a member of the Académie Française, in place of the late Duc d'Aumale. M. Guillaume, who was a pupil of Pradier, is in his seventy-sixth year. He won the Grand Prix de Rome in 1845. His most remarkable works are "Les Gracques," and an exceptionally fine bust of Pradier, which gained him the Medal of Honour in the Salon of 1867. He is the author also of some important works on the history and criticism of art.—The Medal of Honour for painting in the Paris Salon has been awarded to M. Henner; that for sculpture to M. Gardet. The architectural medal is not yet awarded. The "Conseil Supérieur des Beaux-Arts" has, in the architectural section, awarded a travelling studentship to M. André, who has exhibited the drawings of Kom-Ombos and Sirot at the Salon.—The Department of Commerce has given to M. Macombe the concession for the construction of the electric railway to the 1000 Exhibition, to be made on the left bank of the Seine, in the shape of three travelling platforms of different speeds.—M. Carolus-Duran and M. Rodin have been awarded gold medals at the Vienna International Exhibition.—M. Benjamin-Constant is just completing the ceiling painting at the new Opera Comique. The principal foyer will be decorated by M. Maignan, and the vestibule to it by M. Joseph Besset. The smaller foyers by M. Toudouze, Raphaël Collin, and Gervex: the two principal staircases by MM. François Flameng and Olivier Merson. Two large statues by M. Falguière and M. Mercier will find place on the principal staircase. In the small vestibule preceding the Salle d'Attente will be placed the "Pensée" of M. Gustave Michel. In the house itself, above the curtain, two symbolical figures by M. Marqueste will support the armorial bearings of the Republic. The decorative features of the boxes and the balcony will be by MM. Coutan and Lombard. The six large Caryatides at the entrance have been executed by MM. Allar, G. Michel, and Peynot. MM. Guibert and Puech have executed two figures in the niches. The mosaics, the doors and the staircase balustrades have been carried out after the designs of the architect, M. Bernier.—At Fresnes-le-Rungis, on the 10th inst., new municipal buildings, courts, Mairie, and a large hall for public fêtes, are to be inaugurated.—M. Redont, architect, of Paris, has obtained the premium offered by the municipality of Reims for the best design for the transformation and embellishment of the squares and public gardens of that town.—The Salle des Mariages the Hôtel de Ville of Bordeaux has been entirely restored and modified.—M. Falguière has been commissioned to model the statue of Alphonse Daudet which is to be erected at Nîmes.

AUSTRIA.—A school-house and gymnasium are to be erected at Eberding as a jubilee memorial.—The plans and estimates for the new asylum at Klausenberg have been submitted to the building committee.—At an extraordinary sitting of the Council of Oederberg it was resolved to build a bridge over the Oder, at the Zollstrasse, as a memorial of the Imperial Jubilee. A bridge-building committee has been formed to expedite the undertaking. The cost will probably be 50,000 or 60,000 florins.—The new water-supply of Zwickau is to be carried out by

Herr Adolf Niklas, engineer, Tölplitz, at a cost of 78,500 florins.—A regimental barracks, a hospital for women, a set of law-courts, a grammar school, a high school, a post office, a telegraph office, a custom-house, central offices for Government officials, and convict-prison, are all to be erected in Teschen during the course of next year.—Public baths are about to be erected immediately in the town of Aussig at a cost of 40,000 florins.—New buildings for the high school at Kuttenberg are about to be erected. They will be fitted with all modern improvements, and will cost 186,715 florins.—The Austrian Society of Engineers and Architects (Der Oesterreichische Ingenieur und Architektenverein) of Vienna will celebrate its jubilee this year. At the end of November a special "festival meeting" will be held: the occasion will be celebrated by the foundation of a benevolent fund for indigent members, their widows and orphans.—A technical exhibition is to be held at Bozen between September 1 and October 15 of this year to celebrate the Imperial Jubilee. The following are the classes into which the exhibits will be divided:—I. Art Industries: woodwork (carpentry, turning, wood-carving, ecclesiastical art, cabinet, &c.), metal-work (gold and silver filigree, artistic locksmiths' work, ironwork, copper work, and cutlery), stonework (carving, &c.), textile work, glass and ceramic work, paper, leather, and horn work (bookbinding, &c.), paperhanging and decorating work; graphic work (photography, lithography, printing, and engraving); II. Domestic Industries; III. Agriculture.—The second premium has been awarded to the Floridsdorf School competition, on which we commented some weeks ago, has been published. Out of thirty-nine designs sent in, it appears that none have been thought worthy of the first premium. The second premium has been allotted to Messrs. Wilhelm & Schneider, architects, of Berlin.

GERMANY.—One of the objects of the Prussian Academy of Public Works is to advise the various local authorities in technical and architectural questions. The report on the development of Berlin, published a week or two since, is one of the most important papers which it has issued of recent years. Certain principles are laid down both for street improvements and for future extensions of the suburbs, and advice is given to private individuals concerned, to the Government or Municipal Authorities, as the case may be, to consult together and even to compromise their various interests, instead of individually fighting for their special purposes irrespective of the general advantage. This report, therefore, is worth the attention of our municipal officials.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. C. C. Lindsay, Civil Engineer, has removed from 167, St. Vincent-street, Glasgow, to 217, West George-street, in the same city.—Messrs. Geo. Trollope & Sons, builders and contractors, announce that in consequence of the Commissioners of Works having acquired and pulled down No. 15, Parliament-street, which has been occupied by their firm since 1777, they have opened new offices at 14, Mount-street, Grosvenor-square, and at 5, Victoria-street, Westminster. The new offices will be in direct telegraphic communication with Messrs. Trollope's other offices.

THE CRIPPLEGATE FIRE AREA.—The Improvement and Finance Committee of the City Corporation on Thursday last week, presented their report on the desirability of taking steps to effect improvements in the area devastated by fire in Cripplegate. They recommended that no further action should be taken in the matter, as the London County Council regarded the improvement as a local one, and declined to contribute unless the freeholders would surrender the land and the leaseholders gave up their trade interests in the part of the site necessary for the construction of the main street through the area. Mr. Henry Clarke regretted that the opportunity of relieving the congested state of Newgate-street was to be lost, but the London County Council stood in the way, and on them must be the responsibility. Sooner or later the improvement would have to be made. An amendment to refer the report back for further consideration was negatived, and the report was adopted.

OPEN SPACES.—The Hon. E. Chandos Leigh, C. Chairman of the London Playing Fields Committee, makes an appeal for subscriptions towards a sum of 9,800l. for purchasing the freehold of Prince George's Ground, in the Grosvenor Park, extending over about 25 acres, lies near the Raynes Park station, at Merton, Surrey, and is at present leased to the Committee for football and cricket.—On Saturday, 14th ult., Charles-square, Hoxton, was opened to the public, having been acquired at a cost of 100,000l. The needs of this thickly-populated quarter will be met further by a scheme in respect of the churchyard of St. John, Hoxton, under a faculty to be applied for this month, for removal of the tombstones and monuments, and for dealing with the ground in terms of the Open Spaces Acts, 1877-90. The church, dedicated to St. John the Baptist, was built after the Georgian style in 1835-6.—At a recent meeting of the Metro-

politan Public Gardens Association it was announced that the Home Secretary had refused to grant a license to build over the disused burial-ground, commonly known as the "Cross-Bones," in Southwark; so it is hoped that this area, of about 13,000 square feet, and latterly used as a building-yard, will shortly be laid out as a public garden. It stands at the corner of Red Lion and Union streets, and appertained to St. Saviour's, being used for the inmates of the licensed stew in Bankside, abolished temp. Henry VIII.—We understand that it is proposed to sell to the Twickenham District Council the Peel Estate, Marble Hill, about 66½ acres, with a wooded frontage of 2,000 ft. to the river. The house has been untenanted for some years, the last occupant being, we believe, the widow of General Peel. The property was offered for sale by auction in June, 1888, and withdrawn after a bid of 52,000l. The house, designed by Lords Burlington and Ashurst, was built for Henrietta Howard, afterwards Countess of Suffolk, George II. contributing from 10,000l. to 12,000l. of the cost, and was the home of another royal favourite Mrs. Fitzherbert, who, it appears, removed thither from the Terrace, Richmond Hill. In our "Note" of May 5, 1888, we adverted to the design and construction of the house, for whose interior mahogany wood was largely used, the main staircase and the flooring of some of the rooms being made of it. The name of "Jeanie Deans's Walk" has been given to the avenue of elms between the back of the house and the Thames, but this is clearly a mistake, for Sir Walter Scott lays the scene of the interview with Queen Caroline in Richmond Park, which the Duke of Argyll and Jeanie Deans entered on passing through a postern in the high brick wall built for Charles I., and since removed. George II. and his consort occasionally occupied the White Lodge in the Park.

CHURCHYARD CROSS, CARDIFF.—A churchyard cross has just been dedicated at St. John's, Cardiff. The architect chosen when the work was decided upon was Mr. C. B. Fowler, of Cardiff, who has been employed all through the church restoration. It was decided to utilise a stump of the ancient cross, but upon examination it was found that a large foundation had covered by earth, and this also was restored. The shaft has been added to, and an ornamental head provided. The shaft and head are of Portland stone, and the carving was carried out by Mr. W. Clarke, of Llandaff. The design of the head represents the Crucifixion on one side and the Ascension on the other side, surmounted by a canopy and crocketed pinnacles.

THE NEW OLYMPIC THEATRE.—A company, under the name of the New Italian Opera Syndicate, is about to be formed for giving lyrical performances, at popular prices, in this house, of which the unexpired lease for fifty-two years from last Christmas at a rent of 2,350l. 2s. 6d. has been secured, together with the leases of Nos. 16-17, Craven-buildings, and an adjoining plot of land for an equal term, at a ground-rent of 162l. 10s. Some interior alterations and other works will be carried out by the Syndicate's architect, Mr. Bertie Crew. The lease of the theatre has been valued by Mr. Crew at 52,000l., and at 50,000l. by Mr. Edward Clark, the architect. In March, 1893, a company was formed for converting the New Olympic Theatre into a music-hall (opened on August 7 of that year); it had been built after the plans and designs of Messrs. Crew & Sprague by Messrs. Holliday & Greenwood, who made a lease of it in 1877, and was opened on December 4, 1890, by Messrs. George Veale & Co.'s tender of 2,350l. was accepted for certain alterations, redecoration, &c., of the music-hall, but by an order of Mr. Justice Stirling in *Wilmot v. Olympic Music-hall* and others, the sale by auction of the property was fixed for June 30 of the following year. In our issue of December 13, 1890, we gave a description of the decorations, fittings, and other features of the new and enlarged house; it extends round from Craven-buildings to Maypole-alley, replacing the theatre that was built in 1849 on the site of the old Olympic Pavilion, which Philip Ashley had erected after his own designs, for a circus in 1805-6, using the timber and spars of a French man-of-war, *Le Ville de Paris*, given to him by George III., wherein William IV. had served as a midshipman; Ellison conducted it under the name of the Little Drury-lane Theatre. The present theatre, occupying with Craven-buildings the site of Craven-house, covers about 14,000 ft. superficial, has a capacity for more than 3,000, a stage 54 ft. deep, and a proscenium 34 ft. wide; from the stage to the roof above is 65 ft.

LIVERPOOL SCHOOL OF ARCHITECTURE AND APPLIED ARTS.—At a meeting of the Board of the University College, Liverpool, Mr. J. Herbert McNair, of Glasgow, was appointed to take the classes in design in succession to Mr. Anning Bell.

OPEN SPACE, WOLVERHAMPTON.—On the 23rd inst. the burial-ground which surrounds St. George's Church, Wolverhampton, was opened as an open space. The Baths Committee undertook the laying out, according to design prepared by the Borough Surveyor (Mr. J. W. Bradley, C.E.). The cost of the undertaking has been 1,000l., and the contractor engaged was Mr. H. Holloway. Nearly 700 trees and shrubs of various kinds have been planted, over 300 gravestones have been removed, walks and

* F. W. Bushill, architect: See plan, interior, and section in the *Builder*, Dec. 22-9, 1899.

flower-beds have been made, wrought-iron seats fixed here and there, and two new entrances placed, one in Cleveland-street and another in Bilston-street.

ELECTRIC LIGHT, DARWEN.—A Local Government Board inquiry was held at Darwen on the 25th ult. into an application by the Corporation for powers to borrow 30,000l. for electric lighting, and other sums for other purposes.

GRIMSBY MASTER BUILDERS' ASSOCIATION.—A meeting of the employers, convened by the Grimsby Master Builders' Association, was held at the Masonic Hall recently, to consider the best steps to be taken for the mutual protection of employers by the Workmen's Compensation Act, 1897. Mr. J. H. Thompson presided. The Chairman said the provisions of the Act had been discussed in the meetings of the Association, but they had thought it best to call a public meeting of employers, for them to devise the best means to cover extra risk thrown upon them by the Act.—Mr. Tonge, the solicitor and secretary to the Association, said that before the passing of the Act of 1897, unless there was any personal negligence on the part of the employer, there was little liability attached to him, but the alterations to that by the new Act were drastic. Now pure misadventure and accident were no longer a defence, while formerly it was. The employer was now liable in respect of the negligence of any person, whether in the employer's service or not. Formerly it was limited to the negligence of the foreman. The workman's knowledge of a defect was no longer a defence; formerly it was. Contributory negligence could no longer be pleaded, unless it amounted to serious misconduct. The defence of common employment was completely gone. There was no contracting out except for equal or agreed benefits. Formerly contracting out on any agreed basis was permissible. There was now liability for sub-contractors; formerly there was none. There was liability in respect of workmen engaged in manual labour or otherwise. It was formerly restricted to persons engaged in manual labour only, but now a clerk or an errand boy might obtain compensation. There was also a difference with regard to procedure, and in the time of notice for the bringing of an action, while arbitration substituted. The Act applied to employment on a railway, in a factory, mine, or engineering works, in buildings which exceeded 30 ft. in height, and buildings which were being constructed or repaired by means of scaffolding, or being demolished, or any large machinery driven by steam, water, or other mechanical power that was being used for the construction, repair, or demolition thereof. All under the old Factory Act came under this new Act. The statute was the most sweeping and far-reaching for the benefit of workmen ever passed by the House of Commons, and cast upon employers grave responsibilities. He looked upon the most serious part as that of the employer having to compensate in case of total disablement, and they might have to contribute to a workman for the rest of his life, so that that might exceed the maximum in case of death, which was 3000l. It was an Act, and could not be avoided, and it was for them, therefore, to see how they could best reduce the risk. The Chairman said he should think most of the employers were insuring against the risk at common law; he was doing so. Mr. Marrows said the Master Builders' Association had been considering the question of how they could insure against the risk, and had suggested one or two methods. Among these were the looking out of two or three of the likeliest insurance companies, the forming of a mutual insurance company for the town, and the formation of a limited liability insurance company by shares. The difficulties in the way of the mutual company were that they would not know when their liabilities were at an end, and if a limited liability company were formed to cover death it would be necessary to deposit with the Accountant-General the sum of 20,000l. before any capital was formed. Mr. G. L. Alward and Mr. C. F. Carter both suggested the formation of a mutual insurance company. On the suggestion of Mr. Carter, the Chairman took a vote from the persons present of the number of persons who had been killed in their employ, and it was shown that there had only been two such fatalities, and these occurred twenty years ago. Mr. Carter moved that a committee be selected to consider the advisability of forming a mutual insurance society to cover the risk of employers under the Workmen's Compensation Act, 1897. Mr. Alward seconded the resolution, which was carried, and a committee, including the Mayor and Alderman Doughty, M.P., was appointed.

CHURCH-ROW, HAMPSHIRE.—It appears that the movement for preserving the threatened houses in Church-row has met with ill success. At any rate we notice that the site is being cleared of the houses on the north side, next east from No. 5, and the ground is, we understand, to be occupied by a block of residential flats.

ARBITRATION CASE.—Mr. Arthur Cates, Chairman of the Tribunal of Appeal, acted as arbitrator on the 27th ult., in a claim for 15,000l. for a piece of land with a frontage of 1,513 square feet in Great Smith-street, required by the Vestry of Westminster

for their scheme of widening that street. The arbitrator reserved his award.

LEEDS BUILDING BY-LAWS.—The building Clauses Committee of the Leeds Corporation are still busy framing the new building by-laws. They have decided to call in two of the best experts in the iron and engineering trades to advise them concerning the modern structural requirements of an engineering shop. The present by-laws only permit the erection of chimneys built of stone or brick. Iron chimneys will probably be allowed under the new by-laws.—*Leeds Mercury.*

ANNUAL OUTING, CLERKS OF WORKS' ASSOCIATION.—The annual outing of the Clerks of Works' Association of Great Britain will take place on Saturday, July 10, Portsmouth being the place selected.

THE GALLIERA MUSEUM, PARIS.—With reference to the remarks in our note of last week on this building, we are informed that it was under the orders of M. Giniain the architect, and not under those of the Paris Council, that the building was spoiled by the insertion of barred windows in the open arcade in front. The blocking up of the side entrances and the disuse of the side porticoes is said to have been rendered necessary from the fact that these porticoes became a refuge of bad characters. It seems much to be regretted that this exceptional a building should have been spoiled in this way.

CAPITAL AND LABOUR.

PLUMBERS' STRIKE IN THE HARTLEPOOLS.—The agitation for an increase of wages by the operative plumbers of the Hartlepoons has resulted in a strike, the men to the number of over 100 having left work. The men are demanding an increase of 1d. per hour, their present rate of pay being 7½d. an hour. The masters are resisting the demand on the ground that they are at present paying the full wages of the district, whilst the men, on the other hand, declare that both at Stockton and Middlesbrough the wages are 9d. per hour.

SUNDERLAND BRICKLAYERS' WAGES.—The Sunderland bricklayers, and those employed in the district, have given notice to the secretary of the Master Builders' Association for an advance of wages of 1d. per hour. The present rate of pay is 9d. per hour. They have requested that the advance should take effect from July 25 next.

WAGES IN THE BUILDING TRADE, LOOE, CORNWALL.—A meeting of the builders and their employees, Looe, has been held in the Drill Hall, the object being to take into consideration notices given by the employees, first, for an increase of ¼d. per hour, and second, to leave work at 1 p.m. on Saturdays. After discussion, it was agreed that in consideration of the present depressed state of trade in the district, a rise of wages at such short notice was not justifiable. But in order to meet the demands of the workmen in as reasonable a way as possible, it was agreed that the men should leave work at 1 p.m.; that to make up for the shorter number of hours an increase of ¼d. per hour be conceded; and that the altered terms commence from Saturday, June 25. It was also further agreed that after that day all Bank holidays should be observed as holidays by the workmen.

SETTLEMENT OF THE LEIGH JOINERS' STRIKE.—After lasting three weeks, the joiners' strike at Leigh, Lancashire, which has affected about 120 men, terminated at a conference in Leigh of the representatives of the masters and men. The terms of the settlement are that the wages shall be increased from 8½d. to 9d. per hour, the hours reduced from 51 per week to 48½, that two apprentices be allowed for four men, four for eight, and six for sixteen, and no payment made for walking time within a distance of one and a half miles.

WAGES IN THE NEWCASTLE BUILDING TRADE.—Some time since the members of the Newcastle, Gosforth, and District Operative Stonemasons' Society sent in an application to the Master Builders' Association, to expire on June 4, for an advance of 1d. per hour in wages, bringing the minimum rate up to 10d. per hour. The employers offered an extra ¼d. per hour conditionally on the men returning to the nine-hour day. This was refused, and, as the result of further negotiations, the master builders have conceded the full advance asked for on condition that the wallers and setters return to the nine-hour day—the banker hands still to retain the eight hours. This offer the men have accepted, for the reason, as they say, that the joiners and bricklayers had not, as they had anticipated, gone in for a reduction of hours.

ADVANCE OF CARPENTERS' WAGES AT WREXHAM.—The operative carpenters and joiners of Wrexham recently asked for an advance in the standard rate of wages, and the request, it is stated, has now been generally granted. The men have received an increase of 3d. per hour from twenty-four of the largest firms.

THREATENED STRIKE OF LEEDS PLUMBERS.—Some months ago the operative plumbers of Leeds intimated to their employers that they required an advance of wages to the extent of a penny per hour, together with alterations in the working rules. They have been receiving 8d., and they want 9d. In the interval the masters have endeavoured to effect a compromise by offering 8½d. per hour, but so far have failed in their object. The men insist on 9d.,

and for the further consideration of the matter a meeting of the local branch of the Master Plumbers' Association was held on the 27th ult., Mr. John Skirrow, President, in the chair. The result was the confirmation of the decision to offer an advance of a halfpenny per hour. Since it seems, is the only town in the county in which the plumber is paid 9d. per hour, and that being so, the Leeds employers feel that, if they conceded 9d., whilst adjacent towns, such as York, Bradford, Halifax, Huddersfield, and Dewsbury, were continuing to pay less, they would be subject to unfair competition, inasmuch as a considerable proportion of the work now undertaken by Leeds shops is beyond the city boundaries. The representatives of the men, on hearing the masters' decision, plainly indicated that it is the intention of the operatives to come out on strike when their notice terminates unless their terms are granted. The masters' organisation comprises sixty shops, and all the larger ones; the operatives concerned number between 300 and 400.—*Leeds Mercury.*

THE DISPUTE IN THE BOLTON BUILDING TRADE.—A meeting of Bolton joiners was held on the 27th ult. to consider the present dispute. The operatives demanded Easter Monday as a holiday, an increase in overtime rates, an addition to the sum allowed for lodging money, and the introduction of an apprentice rule. The employers gave way on all points except the apprentice rule. They declined to allow any restriction of the number of apprentices. They, however, have agreed that in future apprentices shall be bound. This was accepted by the men, and a strike has now been averted.

LEGAL.

THE WESTMINSTER BUILDING DISASTER.

At the Coroner's Court, Horseferry-road, Westminster, on Thursday last week, Mr. John Troutbeck, the Westminster Coroner, sitting with Mr. John Slater, as assessor, resumed the inquiry into the circumstances attending the deaths of the seven men who were killed by the collapse of the roof and interior of Abbey Mansions, Orchard-street, Westminster. In our last issue we gave the verdict of the jury in the case, but we were not able to print the following notes of the Coroner's summing up.

The Coroner said that the jury had a very difficult duty to perform—to say how the building collapsed. First of all he would ask the jury to dismiss from their minds the evidence of the workman Collins, as not only had it been denied, but it was entirely unsupported, and there seemed no doubt that he was quite wrong in what he said. Whether what he said was wilfully wrong he did not wish to discuss, so that it would be better not to think of that evidence at all. As regarded the collapse, they had heard exhaustive evidence that the interior and roof of the building fell, and they had to be assured in their minds before giving a verdict what actually gave way. They had heard that the concrete of the roof first gave way, but they also had it that the pier collapsed; but what they had to decide was "which gave way first?" They might say that both gave way together, but whichever view they adopted he hoped they would be unanimous. The duty of the jury was to seriously consider the question of criminal liability. Any question of liability to the deceased's relatives was not for their consideration, but they had seven men killed, and who was responsible was the object of their consideration. They must consider the case on every point, but he was glad that the persons most concerned had engaged counsel, who had undoubtedly assisted the inquiry. The jury had to consider the positions of Mr. Pawley, Mr. Rickard, Mr. Murrell, and others. The Coroner then read portions of the evidence to show what each of the witnesses had said as to his own position. The jury had also to consider the point as regards the plans, and whether it was sufficient that plans should be drawn without full details as to the brickwork. With regard to Mr. Pawley, he had himself said he had a free hand in this building; and even after the Admiralty took over the building on November 19, 1897, although Mr. Simpson had charge, he was Mr. Pawley's assistant, and Mr. Pawley admitted that he was still responsible. Mr. Pawley had said that he had distinctly ordered the centring not to be struck, and it was a most serious question to consider who did order it and why it was done despite Mr. Pawley's orders. Again, as concerning the plans of the piers, they were not in accordance with the evidence, whilst the stanchion was not put in at all, and whether that affected the accident, the jury must draw their own conclusions. Mr. Murrell had said that he struck the centring on Mr. Simpson's orders, which was very important, as Mr. Pawley had said he took all responsibility for his assistant, Mr. Simpson. He (the Coroner) thought respecting Mr. Andrews that it was extraordinary that he, the general foreman, was unable to give the details of the pier, whilst the very important arched hole in the wall was not mentioned until Wednesday by any one, and then only by one of the labourers. He really considered Mr. Andrews's evidence very unsatisfactory, while his admissions that certain portions of the building were put up without plans would seem incredible but for it being proved that concrete had been proved by independent experts to have been

improperly mixed, and Mr. Andrews's admissions that he himself saw some go up to the roof, he (the Coroner) considered very important in view of the disaster. It was very important for the jury, in considering what caused the accident, to recall the various witnesses' evidence as to what they first heard and saw. The question of the girders he did not think now affected the inquiry, which had been clearly reduced to two things—the pier and the concrete roof. The evidence was in this case, as it always was in such cases, very conflicting, but he hoped the experts had somewhat cleared up the discrepancies, and that they would not find any difficulty in arriving at a conclusion. The remark supposed to have been sent by Mr. Murrell to the foreman Parker, by telephone, "Don't strike the centring, but go on with the joists to please Simpson, who is the best pal we've got," he (the Coroner) thought almost incredible. According to that, Simpson told Murrell not to do it. Murrell telephoned Parker not to, yet they were asked to believe that Parker, in spite of contrary orders and knowing the danger, set his men at the work. Such evidence seemed hard to believe. Possibly the most important and reliable evidence was that of the stonemasons. Their evidence was most emphatic that they saw the pier "buckle" and then fall, and they were positive that the pier fell first. Considering the expert evidence they must remember that those witnesses were men thoroughly able to speak on such matters, and had given their opinions and the reasons for their opinions. Of the two independent experts—Mr. Drury and Mr. Thomas Blashill—they appeared to lean towards the suggestion that the pier gave way through faulty construction, but the other three experts inclined to the belief that the concrete fell first. He would not think of suggesting that the three experts called by Mr. Pawley had not given their truthful opinions, or had been influenced, but what the jury had to consider was the reasons given by all the experts for their opinions. The Coroner threw emphasis, in conclusion, on the fact that the man who received the extraordinary telephone message, which seemed hardly within belief, that was Joseph Henry Parker, was dead, and so that point could never be settled. The jury retired to consider their verdict, and after a consultation lasting over an hour, they returned into court, and in answer to the Coroner, said:—"The cause of the collapse was the faulty design in the construction of the pier due to the culpable negligence of the architect. Further, the jury are of opinion that some of the concrete was improperly mixed; also, that they feel that greater control should be allowed over the construction of buildings."

The Coroner: Well, that is a verdict of manslaughter against Mr. Pawley. I must say the verdict is very complicated, and I ask the jury to say whether in presuming that their verdict is, as I presume, one of manslaughter, I misjudge their wording?

The Foreman: It is as you suggest.

The Coroner: Then I must commit Mr. Pawley.

Mr. Marshall: Then, if the verdict is one of manslaughter against Mr. Pawley, I must say that he has given the Court every assistance, and I ask the jury's proof that Mr. Pawley has been legally liable as regards the death of these men.

The Coroner: The jury have given their verdict. Now, as regards the question of criminal liability, Mr. Pawley, I am prepared to discuss the question of bail. I will accept 200l. his own recognisance, and 100l. his solicitor.

That being agreed to, the Coroner read to Mr. Pawley the jury's charge against him, and the inquiry closed.

EMPLOYERS LIABILITY LAW.

At Lambeth County Court on the 27th ult., his Honour Judge Emden, heard an action in which a painter named Boucher, sued Messrs. Holliday & Greenwood, builders, of Brixton, for damages under the Employers' Liability Act. On March 1, plaintiff was engaged in painting the gutter of a house in Josephine Avenue, Brixton, when the ladder upon which he was standing collapsed, and Boucher fell from a height of 35 ft. For plaintiff it was sought to make defendants responsible on the ground that they negligently allowed a defective ladder to be used. Among the witnesses called for the plaintiff was Mr. Benjamin Woolard, architect, who spoke to inspecting the ladder after the accident. The ladder, he stated, contained thirty-two rungs, but from what he saw there was no iron support at the top. Such an iron support would, in all probability, have prevented the accident. The ladder broke at a point three rungs from the top, and he discovered that both the rung and the upright were rotten.

The defence was a denial of negligence, but his Honour, in giving judgment for the plaintiff, said it was of the greatest importance that builders should, by periodical inspections and tests, assure themselves that their tackle and plant were sound. The new Act would cast upon employers very serious responsibilities in this matter. In the present case he had not the slightest doubt that the ladder was totally unfit for the job for which it was sent out of the defendants' yard, and, seeing the serious injuries which plaintiff had sustained, he should award him the full amount claimed—viz., 300l.—with costs.

Little Clarendon-st., f.g.r. 1294, reversion in 294 yrs.....	3,180
Aldenham-st., f.g.r. 437, reversion in 294 yrs. ..	3,140
Stibbington-st., f.g.r. 1204, reversion in 344 yrs.	2,580

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Prizes.	Designs to be delivered.
*Chapels, Offices, Lodge, &c.	Salford Corp.	£50, £20, and £10.	Aug. 16

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by	Tenders to be delivered.
*Painting, &c. R.A. Barracks.	War Dept.	R.E. Office, Colchester.	June 6
Pair semi-detached Villas, Horton Bank Top, Bradford.		S. Spencer, Archt. 34, Gt. Horton Rd., Gt. Horton.	June 7
Reconstruction of Canal Bridge, &c. Aberfeldy.	North B.D.C.	D.M. Taylor, Archt. 28, Water-st. North.	do.
Footways, Cardiff, Merthyr, &c.	Glam. C.C.	County Surv. Town Hall, Bridgend.	do.
Main Road Works, Newton Cottage, near Farnham.	do.	do.	do.
Two Houses, Lower Ford Street.	H. Dexter.	G.E. Jenkins, C.E. Bank-church, Coventry.	do.
*Underground Conduits.	Poplar R. of W.	S. Spencer, Archt. 117, High-street, Poplar, E.C.	do.
*Footbridge over Railway.	Tottenham U.D.C.	P.E. Murphy, 712, High-street, Tottenham.	do.
*Repairs to Tar and Asphalt Pavings.	Walsall R.D.C.	The Clerk, P.O. Office, Walsall.	June 8
*Masonry Additions to Workhouse.	Wareham & Purbeck Union.	W. W. Pook, Archt. 23, Market-st., Wareham.	do.
Additions, &c. Stella Stalh Hotel, near Blaydon.	Winsford (Cheshire) U.D.C.	J. Atkinson, Archt. 13, Market-st., Newcastle-upon-Tyne.	do.
Road Materials.	do.	J. H. Cooke, Council Office, James & Morgan, Archt. 1, High-street, Blaydon.	do.
Baptist Chapel, Burgh, Glam.	Creswell R.D.C.	H. Mear, Town Hall, Hammerston Ventry.	do.
*Road Making and Paving.	Stockport Corp.	J. Atkinson, E. B. Peters, Archt. 1, High-street, Stockport.	do.
Sewers, Mile End-lane, &c.	W. J. Lewis.	T. E. Morgan, Archt. 1, High-street, Stockport.	do.
Sewers, Princes Risborough.	Wycombe R.D.C.	Taylor, Bond, & Co., Engrs. 27, Great George-street, Westminster, E.C.	do.
Stable, Cranney, &c.	Cirencester with Tewkesbury U.D.C.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Be. Wall, Eymouth, Warwickshire.	St. Stephen's Church, Cirencester.	J. A. O. Allan, Archt. 31, King-street, Aldershot.	do.
Additions to Farmstead, Blarney, N.R.	Aberdeen School Bd.	M. J. Francis, Archt. 1, High-street, Aldershot.	do.
*Church, Fortsea.	Hampton Vestry.	M. J. Francis, Archt. 1, High-street, Aldershot.	do.
School, Old Aberdeen.	Hecanawick U.D.C.	J. Lane Fox, Archt. Bond-street, Leamington.	do.
Wool Warehouse, Canal-rd., Bradford.	do.	F. F. Beaman, Archt. 2, High-street, Leamington.	do.
*Underground Conduits, Kilburn.	do.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Wood Paving, Central Market Place.	do.	G. O. Forster, Archt. 1, High-street, Leamington.	do.
Additions to Marine Temple, Halifax.	do.	S. Dyer, Archt. Bridlington Quay.	do.
road, Dewbury.	do.	A. J. Taylor, Archt. 1, High-street, Leamington.	do.
Pavilion.	do.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Wrought Iron Pipes and Fittings.	do.	G. O. Forster, Archt. 1, High-street, Leamington.	do.
Cast Iron Water Pipes.	do.	S. Dyer, Archt. Bridlington Quay.	do.
Road Materials.	do.	A. J. Taylor, Archt. 1, High-street, Leamington.	do.
Two Houses, Belgrave-sq., Bridlington.	do.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Sewer, Grandditch.	do.	G. O. Forster, Archt. 1, High-street, Leamington.	do.
The Street Pipes, Filston, Lancs.	do.	S. Dyer, Archt. Bridlington Quay.	do.
Bridge over River Nar, Wastore.	do.	A. J. Taylor, Archt. 1, High-street, Leamington.	do.
Re-building Holmshurst Inn, Farngate Road.	do.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Electric Power Station, Kelham.	do.	G. O. Forster, Archt. 1, High-street, Leamington.	do.
Complete Custom House, Queens Road.	do.	S. Dyer, Archt. Bridlington Quay.	do.
*Underground Conduits.	do.	A. J. Taylor, Archt. 1, High-street, Leamington.	do.
*Wood Paving.	do.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Upland Church, Clifton, Avon.	do.	G. O. Forster, Archt. 1, High-street, Leamington.	do.
*Making-up Streets.	do.	S. Dyer, Archt. Bridlington Quay.	do.
Schools, Acclington-road.	do.	A. J. Taylor, Archt. 1, High-street, Leamington.	do.
Additions to Police Station, Chorley.	do.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Flat Road Metal.	do.	G. O. Forster, Archt. 1, High-street, Leamington.	do.
*Art Gallery and Public Library.	do.	S. Dyer, Archt. Bridlington Quay.	do.
Concrete Footpaths.	do.	A. J. Taylor, Archt. 1, High-street, Leamington.	do.
Two Public Houses, Workop.	do.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Sewage Tanks, &c.	do.	G. O. Forster, Archt. 1, High-street, Leamington.	do.
*Three Weighbridges.	do.	S. Dyer, Archt. Bridlington Quay.	do.
Schools, Home, &c. Anfield Plain, London.	do.	A. J. Taylor, Archt. 1, High-street, Leamington.	do.
Eight H. use, Waterworks-street, Bridlington.	do.	E. R. Nathan, C.E. Poplar, & Co., Engrs. 21, York-place, Edinburgh.	do.
Additions to Workhouse.	do.	G. O. Forster, Archt. 1, High-street, Leamington.	do.
*Police Station.	do.	S. Dyer, Archt. Bridlington Quay.	do.
*Excavate and Foundation Works.	do.	A. J. Taylor, Archt. 1, High-street, Leamington.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by	Tenders to be delivered.
Two Shops and House, Southgate, Essex.	do.	G. Heworth, Archt. Bridlington Quay.	June 17
Alterations to Clapham Church, near Leicester.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to Workhouse.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Pumping Station, Laire Green.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
School Extension, Charter-street, Manchester.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*Sewers, &c.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*Erection and Alteration of School Buildings.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Road Bridge, Penistone-road.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Sewage Works.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Grammar School, &c. Knaresborough.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*Relaying Post Office at Exeter.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Wing and Laundry at Infirmary.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Road Materials (2,000 tons).	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*Sewers, Manholes, &c.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Road Works, Woolmanhill.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*Superstructure of Ayrton near Exeter.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*Erection of Buildings, Supply of Electric Machinery, Train Cars, &c.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to Infirmary.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*Redrains of Asylum Water Reservoir, &c.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Restoration of Church, Addingham.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*Supply of water to Asylum, &c.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*First section of Hospital.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Villa, Purton, near Pontefract.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Two Ships, Roundhay, Leeds.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Bankrupt Premises and House, Alston.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Villa, Malton-road, Colchester.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Widening Lymington County Bridge, near Yarm.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to Asylum, &c.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Building Work, Fortkerry House, Berke, Glam.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to "Old Lodge," &c.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Reservoir, Oakworth, near Kailley.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Factory, Lewin's Mead, Bristol.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to Drill Hall, Carlisle.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Hotel Portland, West Boro, Chester.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Two shops, &c. Halfway, Cumberland.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to School, Garden-street.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to Dalton Hall, Cumberland.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Whitstone Castaway.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to Police Station, Stone.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Restoration, Lingwood Church, Norfolk.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Diallary, Nevill Bridge, Fort Will.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Additions to Business Premises, Barking.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Auction Mart and Shops, Barking.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Right shops and House, Barking.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
*New Buildings at Workhouse.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.
Sixteen Houses, Goldthorpe, near Doncaster.	do.	J. F. Curwen, Archt. 1, High-street, London.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Chief of Surveyor's Dept.	Poplar B. of W.	Commences £500, per an. office and no state.	June 7
*Chief of Works.	Hackney U.D.C.	20s. per week.	June 7
*Chief of Works.	Harvey U.D.C.	160s. per week.	June 13
*Chief of Works.	Wimbledon U.D.C.	20s. per week.	June 13
*Surveyor, Collector, Inspector of Nuisances.	Canterbury U.D.C.	180s. per annum.	June 15

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vii. & viii. Public Appointments, pp. xiv. & xvi.

Kensington.—Kensington-pl., f.g.r. 201, reversion in 51 yrs.	4670	Park-st., &c., f.g.r. 401, u.t. 314 yrs., g.r. 201, commercial-rd., &c., f.g.r. 240, u.t. 324 yrs., g.r. 100.	4290	Wandsworth.—Plough-rd., f.g.r. 351, reversion in 91 yrs.	4295
Waltham-st., f.g.r. 241, u.t. 314 yrs., g.r. 201.	1270	Commercial-rd., profit rentals of 461, 54, for 17 yrs.	2150	St. John's Hill, &c., f.g.r. 200, reversion in 35 yrs.	2150
Waltham.—Convent-st., f.g.r. 451, reversion in 791 yrs.	2160	Trafalgar-sq., f.g.r. 151, u.t. 314 yrs., g.r. 201.	370	St. John's Hill, f.g.r. 151, u.t. 314 yrs., g.r. 201.	510
By C. C. & T. Moore.		Nelson-sq., f.g.r. 481, u.t. 314 yrs., g.r. 201.	1280	St. John's Hill, "Survey House" p.h., &c., f.g.r. 501, reversion in 64 yrs.	1070
Peckham.—Peckham Pl.-rd., &c., f.g.r. 451, u.t. 314 yrs., g.r. 201.	460	Haymer-le-rd., f.g.r. 351, reversion in 414 yrs.	720	Barnwood-lane, &c., a parcel of land, 8 a., f.g.r. 501, reversion in 64 yrs.	3550
Peckham Pl.-rd., &c., f.g.r. 671, u.t. 314 yrs., g.r. 201.	415	Peckham Pl.-rd., f.g.r. 241, u.t. 314 yrs., g.r. 201.	540	Barking.—Longbridge-rd., 21 plots of building land, f.g.r. 501, reversion in 64 yrs.	1130
Peckham Pl.-rd., &c., f.g.r. 501, u.t. 314 yrs., g.r. 201.	210	Peckham Pl.-rd., f.g.r. 701, reversion in 19 yrs.	3,080	Park-av., 120 plots of building land, f.g.r. 501, reversion in 64 yrs.	7,250
Lower Pl.-rd., f.g.r. 301, u.t. 314 yrs., g.r. 151.	210	Peckham Pl.-rd., a peppercorn g.r., reversion in 15 yrs.	1,900	Exwick, Devon.—A Moiety of "Gidley's Marsh," 6 a. 2 r. 29 p. f., f.g.r. 501, reversion in 64 yrs.	850
Frensham-st., f.g.r. 161, u.t. 17 yrs., g.r. 151, with reversion for 20 yrs.	290		2,900		

Five freehold cottages and 1 a. 1 r. 12 p. £635
Various enclosures of land, 95 a. 2 r. 9 p. f. 4,650
hitestone, "Enclosures of land (lakes)"
22 a. 0 r. 20 p. f. 515
"Trilow Farm," 177 a. 1 r. 39 p. f. 2,200

By SLE & SONS (at Barnstable).
Irmacombe, Devon—"Cogworthy Farm," 169 a.
8 r. 8 p. f. 1,750

By VERNON & SON (at High Wycombe).
adgate, Bucks—"Radnage House and Pond
Farm Estate," 215 a. 1 r. 31 p. f. 4,025

By J. ANTHONY LOCKE (at Banbury).
dickoke, Oxon.—Two freehold residences, r. 382.
A freehold house and three cottages, r. 297 98.

By E. HOLSWORTH.
oke Newtonton—185, Church-st., ut. 64 yrs.,
r. 124, f. 524. 375
lpton—68, Kendlesham-rd., f. r. 382. 380

By WAGSTAFF & SONS.
alloway—4 and 6, Hampden-rd., ut. 80 yrs.,
r. 207, f. 524. 490

By G. G. GOWLAND & SONS.
leodonian-rd.—118 to 122 (even), Pembroke-st.,
ut. 514 yrs., r. 324, f. 283 88. 1,360

By G. G. GOWLAND & SONS.
nelsea—37, Ovington-st., ut. 33 yrs., g. r. 61,
r. 457. 185

By G. G. GOWLAND & SONS.
13 and 29, Beauchamp-pl., ut. 25 yrs., g. r. 181,
r. 105, f. 131. 185

By G. G. GOWLAND & SONS.
39, Chapel-pl., ut. 25 yrs., g. r. 261. 1,835

By G. G. GOWLAND & SONS.
23, 14, and 15, Sloane-st.; also 17, 19, and 21,
Kennington-rd., ut. 69 yrs., g. r. 104, r. 834,
r. 111, f. 210. 8,975

By G. G. GOWLAND & SONS.
48, Dargate-gardens, ut. 48 yrs., g. r. 24, f. 824.
r. 105, f. 210. 1,000

By G. G. GOWLAND & SONS.
4, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 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3843, 3845, 3847, 3849,

LONDON.—For the erection of a warehouse, No. 1, Paradise-row, Strand Green, E. Mr. Richard Peters, architect and surveyor, 33, Wool Exchange, E.C. 1.—
Said £2,345 | Marriage & Co. £1,100
Jarvis & Sons £215

LONDON.—Accepted for the erection of a planoforte manufactory in Nursery-lane, Forest Gate, E. for Mr. T. J. Gilbert. Mr. Fred. A. Ashton, architect, 177, Romford-road, Stratford, E. —
A. B. Hill £500

LONDON.—For alterations and redecoration of premises No. 131, Red Lion-square, W.C., for the Board of Governors of St. Paul's Hospital for the Skin and Genito-Urinary Diseases. Messrs. Clark & Hutchinson, architects, 26, John-street, Bedford-row, W.C.
J. McMillan £450 | W. Tipton £291
Parsons & Son £25 | J. Greenwood £28
Wm. Sayer & Sons £13 | * Accepted.

LONDON.—For the erection of three shops and a beer house. Ben Jonson-road, Stepney, E. Mr. Richard Peters, architect and surveyor, 33, Wool Exchange, E.C. 1.—
Said £3,040 | T. Parker £3,795
Jarvis & Sons £375

LONDON.—For rebuilding private residence, Grosvenor-street, W. —
Walter Holt & Sons £13,000

LONDON.—For erecting new buildings, Lord's Cricket Ground, St. John's Wood, for Marylebone Cricket Club —
Walter Holt & Sons, Craydon £1,110

LOWESTOFT.—For additions, &c., to Town Hall, for the Town Council, Mr. G. H. Hamby, C.E., Town Hall, Lowestoft: —
Jno. Ashby £2,829 | C. R. Cole £3,438
Allerton & Dail £850 | G. E. Hawes, Norwich £3,395
J. & B. Swanton £500 | * Accepted.

MIDDLETON ST. GEORGE (Co. Durham).—For the erection of superstructure, &c., of private asylum. Mr. J. W. Dyson, architect, 67, Grey-street, Newcastle-on-Tyne. Quantities by the architect —
S. E. Davidson £14,495 0 0 | Thomas Beetham, Esq. Marshall & Son 13, 100 12 6 | West Hartlepool, £19,350 5 0
J. G. Gordon 13,315 8 0 | J. Dickinson 12,370 5 0
(All amended tenders.)
* Accepted. † Withdrawn.

NEWPORT.—For the rebuilding of premises, Nos. 121 and 122, Commercial-street, Newport, Mon., for Mr. Joseph Watkins Messrs. Morgan & Hodge, architects and surveyors, Newport and Cardiff —
C. Lock £7,320 | D. Parfit £1,171
A. Hazell 2,315 | W. A. Linton 2,116
T. Westacott 2,315 | T. G. Diamond 2,150
† Linton 2,321 | D. J. Davies 2,142
C. H. Reed 2,282 | J. Moore 2,124
Lawson & Co. 2,270 | G. F. Davies 2,095
W. C. Collier 2,200 | J. Davies 2,045
E. Richards 2,200 | * Accepted.

NEWPORT.—For the rebuilding of premises Nos. 29 and 30, Commercial-street, Newport, Mon., for Mrs. Coleman. Messrs. Morgan & Hodge, architects and surveyors, Newport and Cardiff —
John Linton £2,295 | Chas. Hy. Reed £2,200
William Moore 2,370 | W. A. Linton 2,137
C. E. Davies 2,237 | David Jones 2,095
T. G. Diamond 2,252 | T. Westacott 2,053
John Moore 2,249 | * Accepted.

PONTYMYSTER.—For the erection of a house, Pontymyster, Mon., for Dr. Callinan. Mr. C. Telford Evans, architect, Cardiff —
D. Thomas £2,018 0 0 | D. Powell, 65, Tillyer-street, Aberlenny, 589 0 0
W. Jones & Son 855 0 0 | Men. (accepted) £689 17 6
C. F. Morgan 698 10 0

RUSHDEN.—For the erection of house, shop, and bakehouse. For Mr. Saint. Mr. Harry Knight, architect —
Whittington & Tomlin £260 | Frank Henson £515 0
T. & C. Berrill 6 4 0 | T. Willmott, jun. 609 4 0
Hicksley Bros. 599 0 | R. Marriott, jun. 603 0
C. E. Bayes 637 0 | Hy. Sparrow (accepted) 6 0 0

TWICKENHAM.—For the erection of new dining-hall, recreation room, class-room, tailor's shop, dormitory, &c., at Fortescue House, Twickenham, for the National Refuges for Homeless and Destitute Children. Mr. R. G. Hammond, architect, 26, Essex-street, Strand, W.C. Quantities by Mr. W. H. Elsmore, surveyor. —
Carver & Sons £2,456 | W. Brooking £2,295
I. Norris & Sons 2,437 | G. Wade 2,058
T. Hiscock 2,289 | T. Nye, Ealing 2,037
A. J. Batchelor 2,069 | * Accepted subject to arrangement.

WINDSOR AND CLEWER.—Accepted for the construction of about one and a half miles of iron and stoneware pipes, sewers, manholes and lamp-holes, also for constructing and forming roads. Alma Park Estate. Mr. T. V. Davison, C.E., engineer, Bindale Chamber, Frances-road, Windsor —
Cliff Ford, Harlequin, N.W. £3,230

WOODFORD.—For repairs at St. Mary's, High-road, Woodford, for Mr. J. Appleby. Messrs. Edward Brown & Son, surveyors, 151, Commercial-street, Holborn, E.C. 1.—
W. J. Sharp & Son £217 10 | Henry Wells & Sons £168 10

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Illustrations to Article on "Recent Excavations on the Roman Wall, Northumberland"	Double-Page Tone-Block.

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Recent Excavations on the Roman Wall in Northumberland.—II.



Our issue of the 19th of June, 1897, an illustrated account was given of the work done during the preceding three years in the camp of Æsica, by the Roman Wall Exploration Committee, formed in connexion with the Newcastle Society of Antiquaries.

In July of last year the work of excavation was resumed, and has since been carried on continuously with exceedingly satisfactory results.

At first arrangements could not be made to work inside the camp, and as from time to time various detached buildings of importance had been accidentally discovered in the immediate neighbourhood of many of the other camps on the line of the Wall in Northumberland, it was decided in the first instance to search for suburban buildings, the existence of which seemed indicated by the surface inequalities in the pastures on the southern slopes below the camp. A commencement was made close to the outer edge of the south fosse of the camp, and a few yards to the west of the line of the south gateway remains of the walls of a large building were found. As little but the mere foundations of the walls remained, the main lines only of the building were traced and laid down on the plan. Another rectangular building, 44 ft. long by 27 ft. wide, without partition walls, was also found close to the edge of the fosse, at the south-eastern angle of the camp.

At the same time a trench was commenced about one hundred yards further south, where a hypocaust was said to have been found in the early part of the present century by workmen in search of building stones. This trench was driven northward uphill for a considerable distance, and intersected a number of walls varying in height from about 1 ft. to 5 ft. On following the lines of these walls it soon became evident, from the excellent character of the masonry and the existence of numerous rooms with hypocausts, that the building discovered was one of considerable importance. Further work revealed the

remains of a building over 110 ft. long by 73 ft. in width, some portions of the walls of which are still standing more than 6 ft. high. Of this building we give a ground plan (see next page).

It seems to have been the fashion to call almost every detached Roman building in the north of England "baths," if there was any evidence that it had contained a bath, or even if it had rooms warmed by a furnace connected with a series of hypocausts. In the reports of the excavations on the line of the German *Phalgraben*, which are being carried on at present by a Government Commission at the national expense, under the direction of General von Sarwey, this idea has been adopted, and the reports just issued of the work done there recently contain plans and descriptions of buildings called "baths," situated, like that found at Æsica, in close proximity to the camps. Of these, one found at Hofheim Camp resembles much in plan that found at Æsica, especially in having two apsidal-shaped projections from opposite sides of the principal room in the building.

In the time of the Romans, as at the present day, no important private house was considered complete which did not contain baths; it seems probable, therefore, that those found in many of the buildings were merely private baths, and that the buildings themselves were the suburban villas occupied by the commanding officers of the respective garrisons. As this, however, is for the present a disputed point, in describing the find at Æsica we shall simply call it a building, leaving our readers to call it "baths" or "villa" as they choose.

The situation it occupies is at once sheltered and commanding. It lies below the ridge on which the camp itself stands, and is screened by it from the bitter north-east winds that blow there during the early months of the spring. Its front is exposed to the sun during the whole of the long summer days. Eastward it looks out on the far-stretching lines of the Vallum, and the Cawfields and Whinshields ranges of basaltic trap hills, which break into precipices on their northern faces. The view to the westward commands the chain of hills known as the Nine Nicks of Thirlwall, which are really a continuation of the Cawfields and Whinshields ranges, carried about a third of a mile northward from

the line of their westward course by an enormous fault which dislocates the strata in the intervening valley of the Caw burn. There for a short distance the outcrop of trap rock disappears, leaving the defile defended by Æsica, and also still more strongly by the older unexplored camp on the line of the Stanegate, which Mr. Cadwallader Bates reasonably suggests, in his recent history of Northumberland, was the Babaglanda of the Ravennas Chorography. About a hundred yards to the south are seen the almost obliterated lines of the Vallum, and half a mile beyond, along the top of the next ridge, runs the track of the Stanegate, which, although probably the first Roman road in the district, continued in use through mediæval times, portions of it still being represented by existing roads.

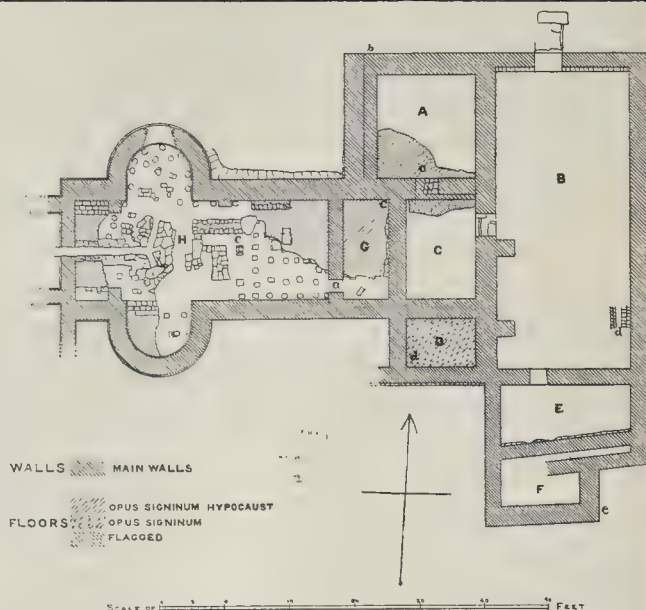
In Roman times the outlook would be on much the same landscape of green fell and heath-clad moorland as that which at present meets the eye, although from existing traces of ancient terraces we know there would then be more spade and plough cultivation than at present, when the hill pasturage is stocked with Cheviot sheep and shaggy West Highland cattle, and the sod remains unturned except by the spade of the archaeologist. A short distance outside of the camps of Condercum, Hunnum, Cilurnum, Procolitia, Borcovicus and Vindolana, but within or to the south side of the Great Wall, important detached buildings have from time to time been found. The largest of these lies close to the west bank of the North Tyne near Cilurnum. It was discovered and excavated in 1884 by the late Mr. John Clayton of the Chesters, and has many features in common with that just found at Æsica. In these buildings and in many others found in the North of England, the absence of an atrium seems to have caused a want of regularity in their ground plan which renders it difficult to assign a definite use to each room, especially when little more than the foundations of the walls remain.

The plan we give is incomplete toward the west, as that end of the building could not be excavated on account of a road that passes over it. At this western end would doubtless be the principal entrance, as it closely abuts on the road leading from the south gateway of Æsica to the Vallum and Stanegate. There would be the chamber

used for storing fuel, and also the furnace for heating the hypocausts, which is indicated not merely by the position and arrangement of the flues, but also by the fact that there they show most of the effects of the great heat to which they have been subjected. The fuel used would probably be wood, although we know that coal was used by the Romans in the North, small quantities having been found during the present excavations.

The western chamber, marked H on the plan, is 40 ft. long by 17 ft. wide. Near its west end the walls form two apsidal-shaped projections to the north and the south, each 10 ft. wide. The northern of these contains the lower portion of a deeply splayed window which has a northern outlook. From the insecure condition of the wall it was thought undesirable to weaken it by clearing out the debris between the window jambs, so that it is difficult to say how the framework holding the glass has been attached to them. Pieces of Roman window glass were found near it, and also close to a similar window found at Cilurnum, so no doubt remains that the Romans used window glass in the North. The opposite southern projection has contained a bath made of concrete, having steps leading down into it. In this room were found a number of peculiarly-shaped dressed stones about 18 in. long by 18 in. wide, and thicker at one end than at the other, which appear to have been voussoirs of an arch connecting the western sides of the two apses. The square projections from the sides of the thin end of these stones would form a bold moulding on each side of the soffit of the arch, or possibly the wall plaster would come up flush with the outer edges.

This room is furnished with flues which supplied the hot air to the hypocaust, and communicate with the hypocaust in a small room, G, by a series of arches under the floor level. Further to the east are two rooms, C and A, both having floors consisting of flags only. The small room, D, to the south of these, seems to have been used as a bath, as the concrete of which the floor consists is a foot thick, and has been carried up the walls and finished with a bold moulding. At the east end the rooms B, E, and F, have not been fully excavated, only the lines of the main walls having been traced. A flight of stone steps leads down from the outside to a doorway in the north end of room B. In this building and in others more recently opened out in the camp itself, two features commonly observed in Roman buildings in the south of England and in other parts of the Roman Empire, are entirely absent; firstly, the bonding courses in the main walls made with large thin square bricks, and secondly, the tessellated pavements which form such beautiful and artistic decorations of many of the villas. The masonry consists of well-squared freestone, and much resembles that of the outer walls of the camp, and that of the Great Wall itself, the thicker walls having squared stones on each face filled in with a rubble core made solid by a "grouting" of mortar poured into the interstices in a semi-fluid condition. One of the sculptures on the Trajan Column at Rome shows an armour-clad Roman workman stirring up this thin mortar in the basket-shaped receptacle then in use for carrying it, which has been replaced by the modern hod.



Plan of Suburban Building near line of Roman Wall, Northumberland.

The present condition of the mortar in the walls affords a means of judging their comparative age; that in the older buildings remaining firm and intact, having contained a large proportion of well-burnt lime, which, by gradually absorbing carbonic acid from the atmosphere, has reverted almost to its original condition when quarried, having become a solid carbonate of lime hardened by the admixture of a small percentage of silica. Of the mortar of the buildings of a later date, found inside the camp, little remains except the coarse sand too freely used in its composition, which had been procured from a sandbed on the banks of the Caw burn, about half a mile distant. The rule that the earlier work is the better holds good with the mortar, as it does with the masonry.

A large proportion of the rooms in this building and in others recently opened in the camp are heated by hypocausts. The pillars (pilae) which support the upper floors of these hypocausts are usually dressed stones, from 18 to 24 in. in height. Examples of their various forms may be seen in the illustrations we publish (see lithograph sheet). Some are cylindrical, others bear a certain rude resemblance to altars, and small altars have actually been found, which had evidently been disused hypocaust pillars, on which the soldier had roughly chiselled a dedication to his favourite god, thus carrying out the vow in fulfilment of which the altar was doubtless made at the minimum cost of expense and labour to himself. Frequently in the south these pilae are formed of large square, tile-shaped bricks about 1½ in. in thickness, simply laid on each other to the requisite height. Such pillars are found in a building at Cilurnum (Walwick Chesters), supposed to be the pretorium, and also in a suburban building at Procolitia (Carrawburgh). In the latter case each tile bore the stamp of the sixth legion, which had its head quarters

at York, but which doubtless in troublous times reinforced the cohorts of auxiliary troops which formed the ordinary garrison of the Wall. In one of the hypocausts inside the camp at Æsica, which is evidently of very late work, the pilae are formed of very small stones built up to the requisite height.

The use of different shaped pilae in one building indicates that the builders were dealing with previously used materials. These pilae usually rest on a floor of beaten earth or clay, and support a course of flags about three inches in thickness, made from a local laminated sandstone, over which is laid a coating of about six inches of "opus signinum," a concrete apparently formed of the refuse of brickfields ground with hot lime. Sometimes in the first laid layer of concrete the ground brick is replaced by very small pebbles and coarse sand. A similar kind of concrete is now much used for the floors of kitchens and outhouses. Locally, in the neighbourhood of lead and baryta mines, the ground brick is replaced by a whitish material known as "mine cuttings," which is the lighter portion of the vein mineral separated from the ores in the process of dressing, it consists chiefly of a white crystalline carbonate of lime, often found in great quantity in metalliferous veins. A still more durable concrete for outdoor work, which has recently been very extensively used, is made from the waste siftings obtained in crushing whinstone by machinery for the purpose of making road metal. This, mixed in the proportion of four or five parts to one of cement, forms a concrete almost as hard as granite.

At the point marked C in the plan, in room H, upon the earthen floor on which the hypocaust pillars rest, more than a hundred coins of copper and a few of base silver were found. The freshest and most perfect of these belong to the Emperors Gallienus, Postumus, Victorinus, Tetricus, and Claudius



Inscribed Stones found during Excavations on the Roman Wall, Northumberland. (From Sketches by Mr. C. C. Hodges.)

Gothicus, who reigned from A.D. 254 to A.D. 270. This hoard had not been secreted in the place where it was found, but had been left above the hypocaust upper floor, as some coins were found adhering to the pillars, while others lay on the debris which had fallen into the broken hypocaust. A few coins were also found at the other places marked C on the plan.

The roofs have been covered with thick rectangular grey slates of local sandstone, which continued to be used through Mediæval times, but are now becoming obsolete in consequence of the comparative lightness and cheapness of Welsh slates, which require much slighter timber supports. In fastening these slates the Romans used heavy iron nails. The builders of Northumbrian pele towers made use of the shank bones of sheep for this purpose as a cheap substitute for nails. The interior walls of the various buildings found at Æsica do not retain so many traces of plaster as those at Cilurnum, where much plaster was found, in which ferns and other vegetable material had been used for bonding. Instead of hair, the leaf impressions being distinctly visible in it when first found. Inside the camp at Æsica was found a small heap, about a wheelbarrow load of what had evidently been the finely prepared plaster, technically known as "putty lime." At each of the two places marked D on the plan, portions of a skull and other human bones were found, evidently not interred there, and probably those of persons who had met their death during the destruction

of the building. Arrangements have been made to fence and leave open this building, as it is hoped that this year sufficient funds may be found to continue the excavations and clear out the unexplored rooms.

In the central portion of the camp itself much work was done last year both on the north and south sides of the vaulted chamber previously found—many rooms with hypocausts and others with floors made of flags having been discovered and excavated, as most of their walls consist of reused materials, they all probably date from the last occupation of the camp.

In previous excavations at Æsica, the scarcity of inscribed stones and the unimportant character of those found have been a cause of regret to the committee. During the present excavations, however, in one of the rooms in the camp, three large stones were found, having inscriptions in an almost perfect condition, and also a number of fragments bearing portions of inscriptions were unearthed there, or in the immediate neighbourhood. We give a drawing of two funeral slabs, which had been used in the flagging of this room, of an altar built into its south wall, and of a broken fragment of an inscribed tablet.

The large stone on the right is a monument which has been erected to—Aurelia—a "dearest sister, aged fifteen years and four months." A rude channelling cut across the stone has obliterated part of the inscription, but the formation of the letters and the way in which the stone is weathered seem to indicate that it is the earliest in

date of those discovered, and was probably erected during the second century. The lettering and inscriptions on the other three shown, leave little doubt that they belonged to the third century. That on the left is also a funeral stone, dedicated to the Gods of the Shades, by a daughter who had caused it to be erected in memory of her father, a Roman citizen of seventy years of age. Novellinus has been suggested as an extension of the name Novel, the e and l being ligulate in both places where the name appears in the inscription, but Novellius, a common Roman name, seems a much more probable rendering. In the name Llanuccus, a peculiarity is the doubling of the l, so common in the commencement of Welsh proper names.

The altar shown in the centre was erected in fulfilment of a vow and dedicated to the Dolichene Jupiter, by a centurion called Lucius Maximus, of the Twentieth Legion, surnamed the Valerian and Victorious. Various readings of the ten letters which follow Lucius Maximus, and are probably a continuation of his name, have been suggested, none of which are satisfactory. The ornament immediately above the inscription resembles one which was afterwards commonly used in late Norman work. A very large and boldly-mounted altar was also found near these, but long exposure to the weather before it was used as building material had obliterated any inscription it might have originally possessed; from its shape and mouldings it seems probable that it was erected during the second century.

A portion of a tile was found bearing the stamp of the second Cohort of the Astures, which for a long period formed the garrison Æsica, as also were fragments of the hollow square tiles used to form flues which carried hot air from the hypocausts up through the walls to the upper chambers. Coarse pottery has been found in considerable quantity, but in this year's excavations little of the finer sorts have been met with. Among the metal objects found were a silver fibula about 1½ in. long, some bronze objects, apparently studs and ornaments, belonging to armour and horse trappings, and some much-corroded iron tools.

It is hoped that the Committee may be able to commence work again next spring at Æsica, and at some of the other unexplored camps on the line of the Wall.

NOTES.

Omissions in the IN giving some extracts last week from the Manuscripts of the Earl of Carlisle preserved at Castle Howard, and which have lately been published by the Historical Manuscripts Commission, we made some comments on the omission of papers relating to art and architecture. Our attention has been called to the following sentence from the editor's introduction:—"It was not thought proper to include the correspondence of the third Earl especially with Sir John Vanbrugh, relating to the erection of the noble edifice which is now the principal seat of the family, and showing the careful attention which was bestowed on its architecture and surroundings," p. iii. But it is obvious that such correspondence may have a high architectural and even social value. It may give information as to the manner of building, the cost, and so forth. The editor gives no reason why "it was not thought proper" to publish these papers. His remark emphasises what we said last week: that material in regard to art and architecture appears to be considered by officials in this country as valueless.

Several of the Paris journals have protested, not without reason, against a vandalistic project entertained in regard to the Palais de l'Élysée at Paris, the official residence of the Head of the State. It is stated that the Department of Bâtiments Civils intends to remove from the building all the eagles and other imperial emblems which adorn the metal work in and around the palace, and replace them by Republican emblems. Considering that this building has been successively the residence of Madame de Pompadour, the Duc de Bourbon, Murat, the Duc de Berry, and Napoléon III., it might certainly be thought that its historic interest counted for something, and that it might be spared this foolish onslaught of "serrurerie démocratique." The Department might as well proceed to remove all the monarchical emblems from the Louvre and the Luxembourg.

THE Thames Conservancy have just issued a new series of by-laws. Nos. 76 and 77 deal with house-boats. The first forbids any sewage or other offensive or injurious matter, whether solid or fluid, to be allowed to get into the river from any kind of boat. The second requires every house-boat and steam

launch to be provided with such sanitary appliances as shall have been approved by the Conservators. This is as it should be: it is absurd for the Thames Conservancy to prosecute Local Authorities for contaminating the Thames, and then to allow the river to be filled with the sewage of house-boats and steam launches. We hope that careful and continual inspection will be made of these craft, for even with proper appliances there is a great tendency to use the river as a cess-pool. Any infringements of these by-laws should be severely dealt with, otherwise their practical value may be greatly lessened.

In his newly-published book, "Birds in London," Mr. W. H. Hudson animadvert upon the

tendency to "civilise" the woods and other open spaces around London, which of late years have been secured for public enjoyment and recreation, by making new roads and paths therein, and transforming the wild and natural growth of trees and bushes into artificial enclosures and plantations. Certain ill-advised proceedings in that direction at Hampstead Heath and Parliament Hill Fields lately aroused protest in the public Press from lovers of natural beauty. We ourselves observe that one of the prettiest walks in Kensington Gardens has been subjected to a similar change. We refer to the avenue that leads from Marlborough Gate, in the Bayswater-road, towards Queen's Gate, in the Gore. It does not form one of the frequented routes across the Gardens, and might well have been left alone; but the pleasant turf is now cut through with a straight gravelled path, and the former charm of the walk under the trees is wantonly destroyed.

Agcroft Cemetery Competition.

WE noticed in our issue of May 7 (page 433) that the Committee of this competition had withdrawn the instructions to competitors and intended to revise them. We have received a copy of the new instructions, which are very materially altered. The objectionable condition that architects were to state the percentage-fee which they expected has been withdrawn, the usual 5 per cent. is promised, and the premium is not to merge in the commission. The demand for ¼-in. scale drawings has been withdrawn except in regard to the plans; the remainder to be ½-in. scale. All this is satisfactory, and shows that the Committee have recognised the reasonableness of the criticisms passed on their original conditions. If they will now add that a professional assessor will be engaged to assist in adjudicating on the drawings, they will have done all that can be expected to produce a fair competition.

Spurious Antiques.

In a letter in the *Times* of Tuesday Mr. Isidore Spielmann, F.S.A., gives some curious statements, apparently from his own knowledge, of the extent to which the manufacture of spurious antiques is now carried on in some parts of the Continent. He states that factories exist "in certain capitals of Europe" (he is apparently unwilling to specify the localities) for the manufacture of all kinds of works of art that are likely to attract amateur collectors. Mr. Spielmann goes on to mention some of the classes of articles forged, and the methods employed. Modern articles of china and faience are stamped with the old marks, so cleverly

imitated as sometimes to deceive even experts. Arms and armour are treated with acids to imitate the effects of time. Carved ivories are stained with oils to make them yellow, and subjected to heat to produce cracks in them. Modern pieces of furniture have wormholes drilled in them. "A genuine old clock would be divided, the dial being put into one new clock, the hands and works into another, and the case into a third; all of them would be cleverly completed and sold as three genuine old clocks." None of these statements appear to us surprising or in the least improbable. There is an artistic moral to be drawn from this state of things which is sometimes overlooked. As long as so many people who purchase works of art value them solely in reference to their age, and without any power of judgment as to their intrinsic merit of design, there will be the temptation to unscrupulous speculators to imitate the only quality which is easily imitable, viz.: age. These people, thinks the dealer, do not want art; they have no judgment in regard to it; all they want is old things. Let us make old things to suit them.

In our last number (see pp. 538-9, ante) we printed some extracts from the Castle Howard MSS. relating to Richmond as a fashionable place of resort during the later years of last century. We notice that there has recently been offered for sale the lease of the Old Palace, described by the auctioneers as "formerly the Trumpeting House." We do not find that the palace, or any portion of the Royal apartments (now demolished) is cited under that designation by Mr. H. W. Brewer in his account of the various buildings which, with an illustration, we published on January 5, 1895. In our issue of June 16, 1888, we gave a view, with plan, of the house, known as the Old Palace, showing the alterations carried out under Mr. H. O. Cresswell's superintendence. In the view will be seen the arch of the principal gate, bearing Henry VII.'s escutcheon, and on its left the semi-decagonal projecting bow, ornamented with a portcullis—a badge of Henry VII.—cited by Mr. Brewer. The Royal apartments lay along the river front, some distance northwards from the present "Old Palace," in the inner court, and, together with the great hall, are depicted in the engraving by Jodoc Hondius, 1610, in Speede's "Surrey" and in Gotch's later drawing, in Aubrey's volume.

The Goupil Gallery.

THE summer exhibition at the Goupil Gallery is perhaps a little too much in one school, but it contains some fine and interesting works in landscape. Some half a dozen works by a painter whose name is not familiar to us, Herr van Soest, are admirable as examples of breadth of style, aerial effect, and sentiment in landscape; the author owes something to the study of Corot, but he is not an imitator, and has his own quality. Among other works in the collection are an exceptionally fine little work by Diaz, "The Heart of the Forest" (26), two small but beautiful specimens of Corot (27 and 37; the other Corots exhibited are not worthy of the painter's fame); a view on the Oise by Daubigny (21), a fine work by Mauve, "Oxen Ploughing" (48), rather out of his usual style; a large and important work of Israel's, "The Anxious Family" (24), and a very fine

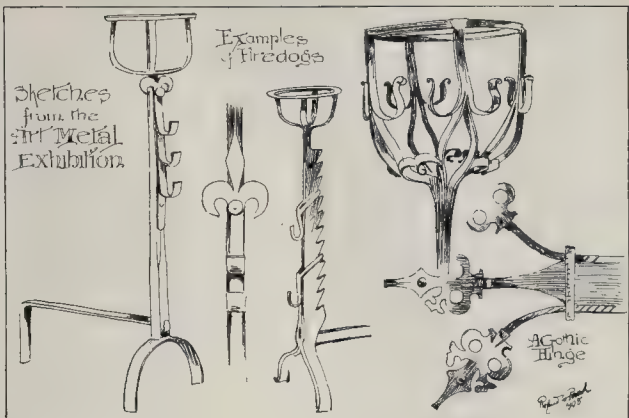
ter-colour, "The Flock" (11), by Herr Hagemans, who appears to be a follower of Auve.

Fine Art Society. THE large room at the Fine Art Society's establishment is divided by a temporary partition for two very different exhibitions, one French illustrated books of the eighteenth century, the other of water-colour sketches of Sheringham and adjacent parts of the Norfolk coast, by Mr. G. Cochrane Kerr. The latter collection includes some good studies of sea effects, such as "Three Miles Shore" (6), "Landing at High Tide" (10), "During the Gale" (12); but as a whole is rather disappointing. The French books display many fine examples of illustrative engraving, and are we believe of great value from the bibliophilist point of view; but that a joy with which a stranger intermeddles not.

It appears probable that the difficulty created by M. Rodin's eccentric treatment of the statue which he was commissioned to produce in honour of Balzac may lead to a version to the model left by the late eminent sculptor Chapu, who in the first instance received the commission from the "Société des Gens des Lettres." Chapu's model, on which he was at work during the last few months of his life, is still in existence. It represents the great author seated at a desk, clad in a long robe. At the foot of the pedestal, on which are inscribed the titles of his works, is a figure symbolising Truth, and presenting to the author the tasks of the "Comédie Humaine." M. Chapu presented this model to the Société, which is already authorised to erect a statue of Balzac on a site in the Place du Palais Royal; and it is thought that with the aid of some one of the late sculptor's pupils the work could be satisfactorily carried out, with a better result than is likely to be obtained by what M. Rodin's ill-advised friends describe as sculpture intellectuelle."

THE TRIENNIAL GREEK PLAY AT BRADFIELD COLLEGE, which will be given this year on the 20th, 21st, and 25th of June, promises (if the weather will only be propitious) to be exceptionally successful. The auditorium has been considerably enlarged by the addition of three or four new rows of seats, for which the ground has been artificially banked up where necessary; a wide step or *diaklisma* left between the old and the new seats, and the access staircases to the latter are placed midway between the line of staircases below the *diaklisma*, according to the orthodox Greek plan. In spite of this arrangement, which must nearly double the accommodation, we hear that the whole of the available seats for the three days are already engaged. In the *σκηνη* itself no material alteration has been made; the partitions forming the back of the scene have been painted and coloured into the semblance of masonry (not a very Greek proceeding, but then the whole thing is itself a piece of scenery, an imitation of the solid edifice), and a new inscription has been painted over the proscenium opening—

ΤΙΣ ΜΑΛ' ΟΥ ΤΗΡΑΙΕ ΣΟΦΟΚΛΕΗΣ ΑΝΘΟΣ ΑΟΙΛΩΝ
described however in archaeologically correct 19th-century characters, which our "fount"



cannot provide; and which may be rendered—

"All hail, old Sophocles, the flower of bards."

for the play is to be the *Antigone* of Sophocles, perhaps the most beautiful of extant Greek plays. The choruses and accompaniments (the latter executed on most classical-looking lyres) have been composed by Mr. Abdy Williams, the professor of music at the College, and a well-known authority on Greek music. An innovation on this occasion will be the introduction of a lady on the scene; hitherto the female characters in the plays have always been played by the College pupils, but there was a doubt about finding an adequate interpreter of *Antigone*, and the part is to be played by Mrs. Gray, the wife of the Head Master, who happens to be both a Greek scholar and an accomplished amateur actress. The Dörfeldian heresy as to the Greek Theatre, it may be observed, has not been accepted at Bradfield; which will be the better for the dramatic effect of the play, at all events.

THE ART METAL EXHIBITION AT WESTMINSTER.

As we have already observed, it is a great pity that this large and important exhibition of artistic metal-work was got together in a place so ill-calculated to display it to advantage, and so completely at variance with artistic associations, as the so-called Westminster Aquarium. Apart from the drawback of the locality, however, the exhibition is a fine and interesting one.

A considerable portion of its interest centres in the loan collection of ancient and modern metal-work, which is especially rich in armour and weapons. Among the bronzes are a few antiques, some Renaissance examples lent by Sir T. D. G. Carmichael, some singular specimens from Benin City, lent by Col. Hamilton, the five great circular plaques recently unearthed at Kew, representing events in the life of Louis XIV., and lent by the Queen, and some charming modern examples by Mr. Stirling Lee. Among the priceless objects is the Becket cup of the Duke of Norfolk, insured for 3,000*l.*, and last seen at the Tudor Exhibition. The portion attaching traditionally to St. Thomas is the ivory cup and cover, the richly-worked and jewelled silver-gilt mounts bearing the London hall mark 1525-6. It belonged to Sir Edward Howard, Standard-bearer to Henry VIII., who bequeathed it to Catherine of Aragon, from whom it reverted by will back to the Howards. The initials of Becket, "T. B.," are entwined with the labels of a mitre alternate with the motto "Estote Sobrii" on the cover. Sir Thomas D. G. Carmichael exhibits some fine Early plate, silver gilt, and the Carpenters' cup, and some plate lent by Sir

Stuart Knill deserve attention. Some pretty modern silversmiths' work is exhibited by Mr. Ashbee, and a most costly damascened clock and candelabra by Messrs. Barkentin, some Medieval locks and caskets of Mr. Saltings, and Mr. David Currie's exquisite Renaissance keys, of the best period of French art, deserve attention.

The richest armour is lent by the Queen—an exquisite French suit, once covered with thin plaquettes of gold, doubtless a present to Henry Prince of Wales; the suit, richly engraved and gilded, made for the same Prince by Pickering, with the extra tilting pieces, all with bands of rose, thistle, and fleur-de-lis; and the demi-suit, with extra pieces, of the Earl of Essex. These could not be surpassed. Mr. Percy Macquoid lends his superb fluted Maximilian suit, made for the Emperor, and formerly in the collection of the Kings of Prussia. Mr. Morgan Williams contributes a gigantic suit of latest Gothic work, about 1490, from a Rhenish castle, and a youth's suit with the badge of the Knights of Malta. A magnificent Gothic suit, found in the Church of Irene in Constantinople, is owned by Lord Zouche; and the life-like marauder from Picardie is Mr. Sullivan's. An entire case of superbly-engraved armour is lent by the Duke of Westminster, whose grandfather purchased it from Horace Walpole; while the Duke of Norfolk contributes an even more extensive series. These, and the few magnificent pieces lent by the Treasurer of the Middle Temple, in whose custody they have been, it is said, from the time of the Elizabethan revels, were quite unknown to collectors. Lord de Hise and Dudley has lent the best of the armour from Penshurst, including the helm of Sir William Sidney and the two-handed sword of Robert Dudley, Earl of Leicester, with the crests and badges, the "bear and ragged staff," carved on its quillons and pommel from the solid steel. Fine collections of armour are lent by Mr. Seymour Lucas, Mr. Morgan Williams, Mr. Sullivan, Mr. Thos. Davidson, Mr. Cozens Smith, and other members of the famed Kernozzer's Club; whilst a matchless Florentine embossed breastplate and gauntlets of the best period are from the collection of Mr. David Currie. The great fighting heaume of Sir Richard Pembridge, K.G., who died one year before the Black Prince, lent by Sir Noël Paton; the visored salloid of the Wars of the Roses, singularly preserved, owing to its being requisitioned from time immemorial in the Godiva processions, and lent by the Mayor of Coventry; the elegant pointed bassinet and camail of Mr. Laking, of the time of Henry V., and the tilting helm of Henry VII. period, lent by the Dean of Westminster, form a matchless group of interesting types, which are not authentically represented in the Tower. The examples of mail have curious histories, which want of space forbids us to quote. The defensive targets, especially the rude buckler sent by Lord Kenyon, and the fragments of horse armour, and the English enamelled bit and spurs, deserve careful attention.

Of the weapons, the Queen contributes a case of swords, comprising the sword of Hampden, the hilt loaded with figure work

carved from the solid steel; the Calendar sword; the extraordinarily finely damascened sword of James I., a Nuremberg work; an early sword with the arms of the Cid, of most rare form; and the superb silver-hilted rapier and left-handed dagger, only matched by a pair with pierced steel guards contributed by Percy Macquoid. Another sumptuous, but later silver-hilted sword is owned by Captain Hutton. Of greater interest is the really unique collection of early swords, beginning with the two Scandinavian specimens recently found in the Thames, the one at Bray, the other at Westminster, both richly worked, and the latter with its gold and silver inlay in almost perfect preservation; this is lent by Mr. Morgan Williams. The most priceless of the series is the famous fourteenth century "Battle Abbey" sword owned by Sir Noël Paton, magnificently ornamented and in perfect preservation. The swords lent by the members of the Kernoozer's form a very numerous series, illustrating every date. The Venetian Schiavone of the Duke of Norfolk and another are especially noteworthy, as are the particularly fine Andrea Ferraras lent by Lord Archibald Campbell.

The series of guns and pistols, especially those lent by the Queen, Lord Zouche, Sir Noël Paton, Mr. Davies, Mr. Harding, a revolver by the Royal Artillery, and, above all, the marvellous series of locks and fire-arms illustrating their evolution in a striking manner, lent by Major Farquharson, would form an exhibition of themselves.

In the corridor, shut off from the main St. Stephen's Hall by a screen, is a series of many hundreds of specimens of the cast and wrought productions of Sussex, contributed chiefly by Lord Leonfield, Lord de l'Isle, Mr. Garraway Rice, Lady Dorothy Nevill, Mr. Longden, Mr. Feetham, and the Maidstone Corporation.

The collection has been arranged and catalogued by Messrs. Percy Macquoid, Francis Laking, Sullivan, Garraway Rice, Morgan Williams, Longden, Krall, Major Farquharson, and Starkie Gardner, Hon. Sec., who, with scarcely an exception, personally arranged for and selected the whole of the loans enumerated.

There is however a great deal of good work to be seen among the articles illustrating modern design and manufacture. A portion of these are distributed rather irregularly on the ground floor; the remainder are disposed in a more systematic and ordered manner round the gallery. Among the ground-floor exhibits are a large pair of wrought-iron entrance gates by Messrs. Starkie Gardner & Co.; the frieze at the top of this, with its figures and heraldic emblems intermixed with foliage, is a fine bold piece of work; in the pilaster panels there is that mingling of realistic with conventional foliage detail which we have often objected to in wrought-ironwork, though it must be admitted that it is not an essentially modern fault, as may be seen on looking at the Louis Quinze wrought-iron gates, lent by Mr. Greville, at the other end of the hall, where there is just the same fault. Another large pair of gates near this (Stand 39), though less free and original in design, is free from this defect, being consistently conventional. Messrs. Starkie Gardner & Co. also show some very good work at Stand 43, in the shape of balcony fronts, &c., in which the design is formed simply by shaping the lines of the work, with no ornamental detail. Among other work in this neighbourhood Messrs. Keeling Teale & Co. (41) exhibit a number of articles of ordinary furniture, screens, fenders, and stands, &c., which are all in a good style of wrought-iron work, though not presenting anything original; a small grille by A. J. Dale, at Stand 40A, is an exceedingly good bit of delicate conventional leaf work, with all the details in keeping; and Mr. J. E. C. Carr (44) shows some good copper and brass repoussé work. At the other end of the hall—beyond the theatre where a kind of variety entertainment is kept up, to the accompaniment of a dreary tinkle of music, for the benefit of visitors generally—there are to be found a pair of wrought-iron carriage gates exhibited by Messrs. Lindsay, Neal & Co., of which they send us an illustration; the general appearance of the gates is good, but the foliage in detail is not good in line nor, so to speak, very well put on. Here there is also, besides the Louis Quinze gates mentioned just now, an interesting pair of old gates from Micklelegate House, York; date 1753. A number of students' designs sent in for competition, and also examples of draw-

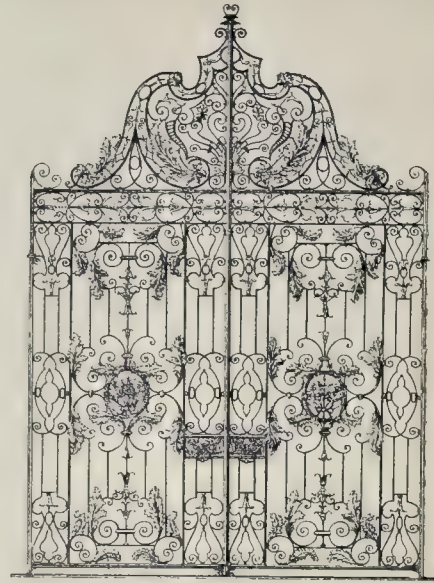
ings and designs from the Sheffield School of Art, are exhibited on this part of the floor. Among the designs for wrought-iron work among these students' drawings, we may notice as good two balcony grilles by "Quentin Massys" and "Wessex" respectively, and also a good and original design for a railing, in which stalks and flowers are treated in a piquant but sufficiently conventionalised manner—also signed "Wessex."

Upstairs the numbers commence in the south gallery, where Messrs. W. A. S. Benson & Co. have a small stand (1) with some of their well-known work, notable for the good lines of form in the vases and other vessels. Mr. Litchfield's exhibit (2) contains some good imitative work in the way of large hanging lamps, &c., in Louis Seize and Adam style—art of the "Salon" type. Messrs. Perry (4) exhibit work rather of the same order, ormolu pendants in Louis Quatorze style, very well carried out; it is interesting to contrast the solid Louis Quatorze pendant with the very realistic detail of the one on the right; the old style certainly carries the day here. The Coalbrookdale Co.'s exhibit (8) is an important one. This is an entirely cast-iron collection, showing some effective and solid-looking railing designs in front, and a number of grates with iron overmantels painted white, and mostly very well and suitably treated; the group includes one designed by Mr. Norman Shaw, another by Mr. Lethaby; but all the work is of a good class and such as architects will appreciate. One large grate is of considerable interest from the fact that the bold decorative band of ornament in relief round it was modelled by no less a person than Alfred Stevens, whose large and bold hand is quite obvious in it; of this the exhibitors have kindly sent us a photograph, and we shall be able to illustrate it in another issue. The Tayler Smith Electric Company (9) show, among other work, a boldly-designed hammered steel shield for a wall, forming the attachment for an electric light, and also a large and massive electric corona for the hall of a club; in these and other exhibits there is something more original and interesting than the usual trade types of electric fittings. Messrs. W. Baily & Sons (15) show some fine bold work in decorative scroll work for balustrades, &c., chiefly of old types and partly, we imagine, reproductions, but very well carried out. Mr. Edgar Simpson, of Nottingham, has a very small exhibit of repoussé copper, in which the frieze is to be commended for purity and simplicity of line; and Mr. W. T. Flowers (Mile End) has a stand of "Art metalwork of exhibitor's own design and craftsmanship;" this includes

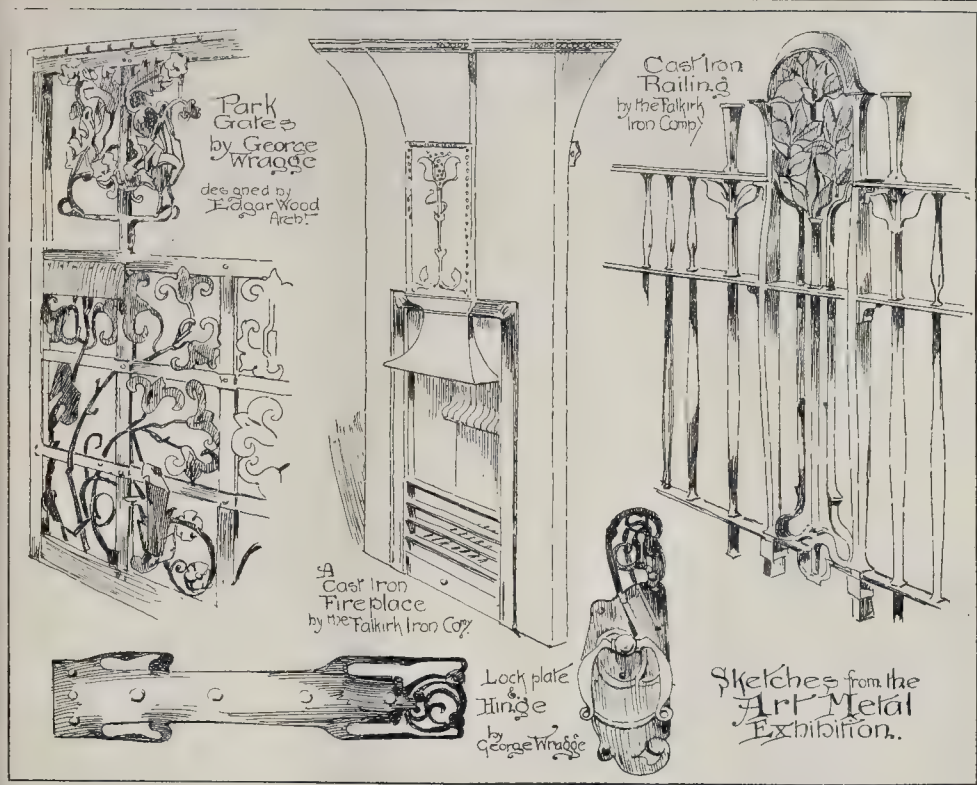
some fine boldly treated bowls or buckets, in repoussé work, with lids.

Along the west wall of the gallery are hung the designs submitted in competition for the poster for the exhibition, some of which are good, but we cannot give space to them at present. At the north-west angle of the gallery we come on what may be called the specially artistic corner of the exhibition, as far as modern work is concerned. Here Mr. Geo. Wragge, of Salford (whose artistically got up catalogue is mentioned in another column in this issue) has a small exhibit, fenced by a very boldly designed and executed grille, of part of which we give a sketch; this is a little too naturalistic in line and style for our taste, but it is all in keeping, it is not a mixture of conventional and realistic, and it is fine free work. A repoussé bronze little plate for a bank is also to be commended for its effective lines. Next to this is the exhibit of Messrs. Longden & Co., which contains a great deal of interesting work. There is a fireplace in polished iron designed by Mr. Ricardo, enshrined amid a decorative landscape of Mr. de Morgan's tiles—the latter is rather too spotty in effect; a grill designed by Sedding, a small repeating scroll pattern with a very bold frieze of large leaves along the top; a set of repoussé plates designed by Mr. H. Wilson; and a very good grate with a repoussé steel architrave (it may be called) and a fender with the top treated in the same style. There is also an ecclesiastical screen designed by Mr. Westlake, with Gothic tracery entirely carried out in copper, and a group of figures in the same metal over it; the general design is a little too much the old Gothic revival style, but it is an excellent piece of work.

On the other side of the passage, against the wall, the Falkirk Iron Company have a large and very artistically arranged exhibit which is of great merit and interest. The present art manager, Mr. Byres, considering that the Company produce nothing but work in cast iron, has been seriously setting himself to find some new departures in cast-iron work—to treat it artistically in a manner suitable to the material and not recalling or suggesting wrought iron, and he has succeeded in getting some excellent work done. The railings at each side of the exhibit, of one of which we give a sketch, are capital specimens of simple but characteristic form in cast iron. The grates and overmantels, one of the smaller of which we illustrate, are also very good in design; some of them are by Mr. Jack, some by Mr. Ashbee. Some new experiments have been made in the preparation of patterns, especially for surface ornament; some of them have



Gates by Messrs. Lindsay, Neal & Co.



been at first repoussé copper, backed up with iron to strengthen them and then cast from; in other cases a surface ornament has been painted on with gesso, from which a permanent metal model has been made for the heavy casting work; and the contour of surface formed by the gesso suits very well for superficial cast ornament. The only remark we would make in regard to this and Messrs. Longden's exhibit, is that we are surprised that firms which can see the advantage of employing gifted artists to make their designs should not append the names of the artists (which we only learned in conversation) to their several works, especially as its effect must be to add to the interest of the exhibits.

At the end of the north gallery Messrs. Potter have a large exhibit, a good deal of which consists of the ordinary type of ecclesiastical metal work; but they have a good bold grille as a fence to their exhibit; we notice also among the objects a very finely executed cabinet in open wrought iron work, and some vases in a composition resembling pewter; one of these, in which a nude figure forms the handle, is a very good piece of work.

There are other well-known firms—Messrs. Stode, Messrs. Barkentin & Krall, and others—who have large and important exhibits of well executed and in some cases sumptuous work, but mostly of the type that one is familiar with. We have rather aimed here at giving special attention to work which presents some novelty and originality of artistic type, as the development of the artistic treatment of metal work was the main object of the exhibition.

MEMORIAL TO THE LATE DEAN MONTGOMERY, EDINBURGH.—It has been decided by the committee who have raised subscriptions for a memorial to the late Dean Montgomery that the memorial (a recumbent effigy in marble of the Dean) shall be placed in St. Mary's Cathedral under one of the arches which separate the sanctuary from the north choir aisle. A sub-committee has been entrusted with the selection of a sculptor; and Mr. H. J. Elanc, R.S.A., architect, is to design the base on which the figure will rest.—*Scotsman*.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A BUSINESS meeting of this Institute was held on Monday at No. 9, Conduit-street, Regent-street, Mr. H. L. Florence, Vice-President, in the chair.

The Hon. Secretary, Mr. W. Emerson, announced the decease of Mr. Sydney Stent, Fellow, of Cape Town, and Judge Meadows White, Hon. Associate.

The Chairman announced that the Privy Council had intimated their approval of the amendments made in by-laws 9, 15, 30, and 31.

The Chairman then read the report of the scrutineers re the election of Council and Standing Committees for the year of office 1898-99. The new Council is constituted as follows:—

President.—Professor Aitchison, R.A., *Vice-Presidents.*—Messrs. W. Milner Fawcett, M.A.Cantab., F.S.A.; H. L. Florence; Ernest George; and E. A. Gruning. *Hon. Secretary.*—Mr. William Emerson. *Members of Council.*—Messrs. John Belcher; Thomas Blashill; James Brooks; J. McKean Brydon; W. D. Caröe, M.A.Cantab., F.S.A.; Campbell Douglas (Glasgow); J. A. Gotch, F.S.A. (Kettering); Alexander Graham, F.S.A.; Benjamin Ingelow; E. W. Mountford; Beresford Pite; John Slater, B.A.Lond.; Percival Gordon Smith; R. Phené Spiers, F.S.A.; H. Heathcote Statham; Leonard Stokes; Paul Waterhouse, M.A.Oxon.; and Aston Webb, F.S.A. *Associate-Members of Council.*—Messrs. A. S. Flower, M.A.Oxon., F.S.A., and H. T. Hare. *Representatives of Allied Societies.*—Messrs. R. I. Bennett (Manchester Society); W. L. Bernard (Bristol Society); A. N. Bromley (Nottingham Society); J. J. Burnet, A.R.S.A. (Glasgow Institute); T. Drew, R.H.A. (Royal Institute of Ireland); C. B. Fowler (Cardiff, South Wales, and Monmouthshire Society); J. Hine Devon and Exeter Society; Leslie Ower (Dundee Institute); and A. E. Sawday (Leicester and Leicestershire Society). *Representative of the Architectural Association (London).*—Mr. G. H. Fellowes Prynne.

The following Fellows and Associates were

declared duly elected to serve on the respective Standing Committees for the ensuing year of office, viz.:

Art Standing Committee.—*Fellows.* Messrs. J. Macvicar Anderson, F.R.S.E.; James Brooks; J. M. Brydon; W. D. Caröe; Ernest George; E. W. Mountford; Beresford Pite; H. Heathcote Statham; Alfred Waterhouse, R.A., LL.D.; and William Young. *Associates.* Messrs. R. S. Ballour; Owen Fleming; J. S. Gibson; H. T. Hare; G. C. Sherrin; and J. W. Simpson.

Literature Standing Committee.—*Fellows.* Messrs. H. L. Florence; Alexander Graham, F.S.A.; B. Ingelow; J. Tavenor Perry; W. A. Pite; Sydney Smirke; R. Phené Spiers; H. Heathcote Statham; Paul Waterhouse; and R. Selden Warnum. *Associates.* Messrs. A. T. Bolton; A. S. Flower; A. N. Prentice; R. Elsey Smith; Leslie Waterhouse, M.A.Cantab.; and P. Worthington, M.A.Oxon.

Practice Standing Committee.—*Fellows.* Messrs. T. Batterbury, S. F. Clarkson, T. Harris, G. Hubbard, A. H. Kersey, J. Douglass Mathews, W. Hilton Nash, J. Osborne Smith, C. J. Smith, and Edmund Woodthorpe, M.A.Oxon. *Associates.* Messrs. W. H. Atkin-Berry, C. H. Brodie, F. T. W. Goldsmith, H. H. Langston, A. W. Tanner, and W. H. White.

Science Standing Committee.—*Fellows.* Messrs. Lewis Angell, M.Inst.C.E.; H. W. Pratt; J. S. Quilter; H. D. Searles-Wood; W. H. Seth-Smith; P. Gordon Smith; A. Saxon Snell; Lewis Solomon; W. C. Street, Assoc. Inst.C.E.; and Benjamin Taberner. *Associates.* Messrs. S. B. Beale; H. W. Burrows; Max Clarke; B. J. Dicksee; Matthew Garbutt, A.M.Inst.C.E.; and G. Pearson.

The Auditors are Messrs. Zeph. King and Frederick William Marks.

On the motion of the Hon. Secretary, a vote of thanks was accorded to the scrutineers.

The following candidates for membership were then elected by show of hands:—

As Fellows: M. F. Cavanagh, Vice-President of the West Australian Institute of Architects (Perth, West Australia); J. J. Thomson; C. E. Bateman, President of the Birmingham Architectural Association (Birmingham); J. Souttar,

President of the Aberdeen Society of Architects (Aberdeen); F. W. Lacey, M.Inst.C.E. (Bournemouth); G. C. Sherrin; W. B. Gwyther, A.M.Inst.C.E. (Calcutta). *As Associates:* G. Benson, President of the York Society; Frank Peck. *As Hon. Fellows:* Sir E. J. Poynter, President of the Royal Academy.

The Chairman then formally presented the revised schedule of professional charges, and moved its adoption.

Mr. J. Douglass Mathews, Chairman of the Practice Standing Committee, explained the reasons for the alterations, and showed in what way the schedule differed from the original form.

Mr. Beresford Pite objected to the proposals, on the ground that it was unnecessary that there should be any change at all. The old form had been in use twenty-five years. He did not desire, however, to move an amendment.

The matter was discussed clause by clause, and two clauses having been amended and agreed to, the discussion of the matter was adjourned until the 27th inst.

The Chairman then announced that the next meeting of the Institute will be held on the 20th inst., when the Royal Gold Medal will be presented to Professor Aitchison, R.A., the Address usual on this event being delivered by the Past-President, Mr. Penrose.

The meeting then terminated.

THE SURVEYORS' INSTITUTION:

ANNUAL MEETING.

THE annual meeting of the Surveyors' Institution was held on Monday afternoon, in the temporary premises of the Institution, Savoy-street, Victoria Embankment, Mr. Christopher Oakley, President, occupying the chair.

The first business was the reading by Mr. J. W. Penfold, Hon. Secretary, of the scrutineers' report on the election of Council for 1898-99. The new President is Mr. Robert Vigers; the Vice-Presidents are Messrs. T. M. Rickman, London, R. G. Clutton, London, John Shaw, Derby, and Sir J. F. L. Rolleston, Leicester; and the ordinary members of Council are—Messrs. A. Vernon, High Wycombe, H. Drew, Exeter, F. T. Galsworthy, London, A. Buck, Worcester, H. T. Steward, London, C. Bidwell, Ely, R. Horsfall, Halifax, W. Wright, Wollaton, G. Langridge, Tunbridge Wells, J. W. Fair, Preston, T. T. Wainwright, Liverpool, H. Martin, London, J. S. Kincaid, Dublin, A. R. Stanning, London, A. Savill, London, The Hon. E. G. Strutt (Provincial Chairman), Chelmsford; Professional Associates, E. Smyth, London, J. H. Sabin, London; Associates, Sir J. Wolfe Barry, K.C.B., Sir R. E. Webster.

The Secretary, Mr. Julian C. Rogers, then read the thirtieth annual report of the Council, from which we take the following extracts:—

"A section of the Council's report presented in May last year was devoted to the consideration of certain proposals (then in contemplation), the object of which was to render the Institution still more useful to the members in whose interests it exists. Some of these proposals are necessarily deferred until the new buildings are completed, when the Council will at once endeavour to give effect to them. Others it has been found possible to put into immediate operation. The establishment of an employment registry has met with general approval, and has been the means, in many instances, of promoting the interests of the younger members and of helping employers to obtain suitable assistants. It has also been instrumental, in some cases, in providing landowners with resident agents, but the inherent difficulty of bringing the registry under the notice of employers of this class can only be surmounted by time. The suggestion that a précis of each paper should be circulated some days before it is read has also been adopted, and the new arrangement has been found useful. But the inauguration of the system of country meetings will probably be regarded as the most important of the new departures in its effect upon the future welfare of the Institution. The election of Manchester as the place for the first meeting of the kind was determined by the fact that the membership is larger in Lancashire and Cheshire than in any other provincial committee district in England. Further, it is an important examination centre; and lastly, the invitation to the Institution to visit the city was given with such peculiar heartiness and such a manifest desire to ensure the success of the meeting that it was impossible to hesitate in making the choice. . . . About 140 members from all parts of England took part in the various features of the extensive programme of arrangements. Of these, 120 were present at the meeting in the Lord Mayor's parlour. Upwards of 100 attended the dinner in the evening at the Grand

Hotel, in addition to the official guests, among whom were the Lord Mayor, the Dean and the Recorder of Manchester, the Vice-Chancellor of the Duchy, Sir Leader Williams, and other distinguished persons. About sixty members joined the party who inspected the Ship Canal. . . . The excursion to Chester and Eaton Hall was attended by upwards of fifty members under the guidance of the Hon. C. T. Parker and Mr. H. S. Whalley (Fellows). . . . The excursion to the Great Railway Works at Crewe was joined in by some twenty members. . . . Other members availed themselves of the invitation of Messrs. Howarth to visit their cotton mills at Ordsall, and the permission of the Rivers Committee of the Corporation of Manchester to inspect their Sewage Farm at Davy Hulme. Altogether the Manchester visit proved to be an unqualified success—a result largely due to the unremitting efforts of the Counties Palatine Committee, under the able chairmanship of Mr. John Holden. The thanks of the Council are especially due in this connexion to Mr. Holden, Mr. J. Bridgford, the Hon. C. T. Parker, Mr. H. S. Whalley, Mr. J. D. Wallis, Mr. Henry Fowler, Mr. John Bowden, Mr. Glegge Thomas, and Mr. T. de Courcy Meade. The Council are also under great obligations to the four members, Mr. J. Holden, Mr. C. P. Hall, Mr. T. Blashill, and Mr. Howard Chatfield Clarke, who were good enough to prepare papers for the meeting. The question of the locality for next year's provincial meeting will shortly engage attention. The Council are prepared to receive and carefully consider suggestions on the subject from the various provincial committees in other parts of England. It will, of course, be necessary in coming to a decision to have regard to the suitability of the locality, with reference to surrounding places of professional interest for local excursions.

The following table shows the present number of members of various classes, as compared with the corresponding period of last year:—

	Honorary Members.	Fellows.	Professional Associates.	Associates.	Students.	Colonial Fellows.
May, 1898	17	1,235	615	85	272	2,336
May, 1897	15	1,797	540	84	252	2,702

The losses by death have been very heavy during the year. Two Past-Presidents have died—our lamented colleagues Mr. Robert Collier Driver and Mr. Charles John Shoppee. Both of them were loyal friends to the Institution, never grudging time or money spent in its service, and both will be long remembered by those who had the privilege of knowing them either in professional or social life. Among other valued members who have died may be mentioned Mr. Charles King Bedells, a well-known figure and formerly a frequent speaker at the ordinary general meetings; Mr. William Radford, an eminent surveyor in the north of England, and Mr. Josiah Thomas, of Bristol. . . . Subscriptions show an apparent increase of about 850l. during the year 1897, but it should be explained that the amount under this head for the year 1896, with which the comparison is made, was adversely affected by the fact that upwards of 500l. of income that really applied to 1896 was received from the new Irish members in 1895, and credited to the accounts of that year. It follows that the actual increase under the head of subscriptions, as between the years 1896 and 1897, was about 330l. . . . There was paid to contractors during the year in respect of the new building the sum of 4,500l. The western half of the buildings over the archway which crossed Little George-street passed to the Institution under the terms of the new lease, and the Council came to the conclusion that it was desirable to purchase the other half (which was done for 500l.), and remove the whole structure, thus securing a corner site, with a clear frontage to Great and Little George-streets, to the great improvement of the appearance of the new building when completed.

The want of shelf-room in the temporary premises has rendered it impossible to make any considerable additions to the library during the year. The present number of books is about 7,000, and as provision will be made in the new library for upwards of 15,000 volumes, there will be ample opportunity for the expenditure of the money which has, with a view to the future, been allowed to accumulate in the library fund. This leads naturally to the subject of the new building in Great George-street. The Council regret to say that there has been great delay in the execution of the contract, but they are doing their best to hurry on the completion of the works. . . .

An important modification has been introduced this year for the first time in the regulations under which a candidate can obtain an Examination Certificate. Hitherto, he has been able to secure a pass on his work as a whole, without reference to his knowledge of any one subject, and that possibly the most important, having regard to the branch of the practice to which the examination applied. In view of this fact, the Council decided that the time had come for indicating a characteristic subject in each division and sub-division in which the candidate—however excellent his work might be in the remaining subjects of his examination—must pass in

order to obtain his certificate. Under this new arrangement those candidates who obtain pass marks in the examination as a whole, but fail in their "typical" subject, are permitted to re-enter for examination in that subject the following year, without being required, as heretofore, to undergo re-examination in the whole group of subjects. . . . The effect of the new arrangement on the results of the recent examinations shows that twenty-four candidates who passed the examinations as a whole failed in their typical subject, and are referred back to their studies in that subject. The percentage of total passes to entries has been this year 63.77 per cent., as against an average of 69.22 per cent. for the whole period covered by the examinations, and 63.97 the percentage of passes last year.

The prizes were awarded as follows:—The 'Institution' Prize, of the value of 15 guineas, was awarded to a candidate in the Valuation Sub-Division, who obtained 82.5 per cent. of his possible marks. The 'Special' Prize, of the value of 10 guineas, was also gained by a candidate in the Valuation Sub-Division, with 82.1 per cent. of the maximum marks. The 'Crawley' Prize was divided between two candidates, who each obtained the highest possible marks in the subject of 'Valuations' in the Land Agency Sub-Division of Division IV. The 'Penfold' Gold Medal went to the candidate who obtained the highest marks (79.5 per cent.) in Division IV. The 'Penfold' Silver Medal was gained by a Valuation candidate in Division III, who obtained 83.8 per cent. of the possible marks; the same candidate obtaining the Driver Prize. The 'Thomas Sanders' Prize was awarded to the candidate who, in the Preliminary Examination, headed the list with 69.8 per cent. of the possible marks. The 'Daniel Watney' Forestry Prize has not been awarded this year, there being no paper of sufficient merit in the subject. The Council feel that their thanks and the thanks of the members are due to the honorary examiners, who have again rendered such valuable service to the Institution. They especially desire to express their sense of obligation to the members of the Bar whose work in connexion with the legal subjects comprised in the examination has this year been exceptionally heavy. The assistance rendered by Mr. E. J. Cashe, Q.C., Mr. G. M. Freeman, Q.C., Mr. T. W. Wheeler, Q.C., Mr. J. W. Willis Bund, and Mr. H. A. Rigg, has been of inestimable value. To other members—viz., Mr. T. A. Dickinson, Mr. C. John Mann, Mr. E. B. T. Anson, Mr. W. Eve, Mr. F. Lee, Mr. F. H. A. Hardcastle, Mr. W. B. Canning, and Mr. F. H. A. Murray, their thanks are also due, as well as to their colleagues on the Council, who have undertaken some of the most voluminous and difficult of the papers. The Council have also once more to record their sense of deep obligation to the Earl of Jersey for permitting the 'Surveying' and 'Forestry' examinations to be held in his park at Osterley, and for the great hospitality which he has extended to all connected with the examination. They have also to acknowledge the kindness and consideration of his Lordship's agent, Mr. W. D. Little, in making arrangements for the convenience and comfort of candidates and examiners. . . .

Of the 127 candidates for the Preliminary Examination, 100 were examined in London, of whom 72 were successful; 24 were examined in Manchester, of whom 20 were successful; and 3 were examined in Dublin, all of whom passed.

The volume of 'Transactions' for the session which ends with this report will be the largest ever issued by the Institution. It also contains more papers than any previous volume. . . . A new volume of 'Professional Notes,' the eighth of the series, was completed in February last. The Council are constantly receiving testimonies to the value of this publication, and their thanks are due to the many members who are ever ready to enrich its pages with the fruits of their knowledge and experience.

The junior meetings continue to be fairly well attended, and the Council have reason to believe that they are fulfilling their purpose in enabling the younger members to acquire facility in speaking, and the power of lucidly expressing their ideas in writing—accomplishments of the utmost value in after life. It is a pity that the advantages to be derived in this respect do not impress themselves so much as they should upon the many hundreds of young members who are qualified to attend these meetings, and it is a question whether it would not be desirable to insist on a certain number of attendance (at any rate, for London candidates) as a necessary qualification for entering for the Fellowship Examinations and from London students as a qualification for candidates for the Proficiency Examination.

Many matters of general interest to the profession have engaged the attention of the Council during the year. Among them may be mentioned the Bill introduced by the London and County Council for amending the London Building Act, 1894. Some of the proposals of the Bill were regarded by your Council as open to the gravest objections, and with the advice and assistance of the Building Committee, who were greatly aided, as on previous occasions, by Mr. H. T. Steward and Mr. A. R. Stanning, they prepared and lodged a petition against the Bill, with the result that the features of the Bill to which the Council took exception have been considerably modified. . . . The Council have pleasure in announcing that the portrait by Sir

Francis Grant, P.R.A., of the late Mr. John Clutton, the first President, has been presented to the Institution by his eldest son, Mr. Robert George Clutton, Vice-President, and will be hung in a suitable situation in the new building.

On the motion of Mr. Clarke, seconded by Mr. Collier, it was agreed that the report and balance-sheet be received and adopted, and printed with the "Transactions."

A vote of thanks having been awarded to the auditors, Messrs. Newmarch and Hall, it was agreed to request them to continue their services as auditors.

A vote of thanks was also passed, on the motion of Mr. Harston, to the President, Vice-presidents, and Members and Associates of the Council.

Mr. Shaw then proposed a vote of thanks to Mr. Penfold, hon. secretary, and to Mr. Julian Rogers, secretary, for the able manner in which they had acted on behalf of the Institution during the past year. In regard to Mr. Rogers, much of the success of the Manchester meeting was due to him, and, as their secretary, he had devoted his life to the affairs of the Institution.

Mr. Harston briefly seconded, and the vote of thanks was carried unanimously.

Mr. Penfold having replied (remarking that he had been connected with the Institution for thirty years),

Mr. Rogers said that he had held his present position for the past twenty-nine years, and during the whole of that time he had received great kindness and indulgence from all the past Presidents and others.

A vote of thanks having been accorded, on the motion of Mr. Newmarch, to the scrutineers,

The Chairman presented the prizes, as follows:—The Institution Prize, to Mr. D. Lloyd, of Brixton; Special Prize, to Mr. R. G. G. Reed, Croydon; the Driver Prize and Penfold Silver Medal, to Mr. C. J. H. Thomas, of London; the Penfold Gold Medal to Mr. F. S. A. Banks, of London; and the Crawford Prize to Mr. C. G. Eve, Bedford, and Mr. W. P. Cheakston, Huntingdon (bracketed equal).

On the motion of Mr. Howard Martin, seconded by Mr. Sabin, a vote of thanks was passed to the Chairman, Mr. Oakley, who, in reply, said that though he ceased to be President, he should not cease to take a warm interest in the affairs of the Institution.

The Chairman then introduced the new President to the meeting, and invested Mr. Vigers with the gold chain of office.

Mr. Vigers, in thanking them for the honour they had conferred upon him, said that he was one of the oldest members of the Institution, and from his first connection with it he had desired to become its President. He was proud of the Institution, as he hoped they all were.

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION: FIRST SUMMER VISIT.

ON the 4th inst., a party of about fifteen, among whom was the newly-elected President, Mr. G. H. Fellowes Prynne, was conducted by Mr. G. A. Lansdowne to Sutton Place, near Guildford. The visitors walked from Worplesdon Station to the beautiful old manor house, where they were received by Mr. Sidney Harrison, the tenant. The owner of Sutton Place is Mr. F. H. Salvin, who is descended from the original builder, Sir Richard Weston. The house, which stands in a park containing many luxuriant and stately trees, was built about 1525, and is of red brick with terra-cotta dressings and a red tiled roof. It is, perhaps, the earliest example of the use of terra-cotta in England. This material was also used about the same date at East Barsham and at Layer Marney; but from that period till the recent re-introduction it never seems to have been used in this country.

The house at present consists of three sides of a quadrangle. The north wing, which formed the fourth side and contained the entrance gateway and tower, was pulled down in the eighteenth century, it being then in a ruinous condition. The materials were used to form (at least) one dam in the River Wey, and it is not quite clear whether others do not owe their origin to the same source!

Of the remaining three sides the southern and central portion of the house consists principally of the great hall. This is a fine room, about 50 ft. by 25 ft. by 30 ft. high, panelled in oak to half its height. The windows, which

are mullioned and with one transom in each, have cusped heads to all the lights. The latter are glazed with clear glass in diamond shaped panes, and in this ground are set painted coats of arms and emblems—one in every light. The windows are in two ranges, corresponding with the ground and first floor windows of the rest of the house.

The east wing contains a fine oak staircase of the early part of the eighteenth century, leading to a very fine gallery on the first floor. This has windows on both sides, and, in its present form (which is probably not the original one), it is 152 ft. long, including the space occupied by the stair, by 21 ft. wide by 15 ft. high. This gallery forms a most stately feature, and would alone have repaid the visitors for their journey.

The ground floor of the east wing has never been repaired and put into a habitable state since the occurrence of one of the two fires which unfortunately have broken out since the house was built. The west wing and the remainder of the south side contain numerous lofty rooms, which at present form the living rooms of the house. To the west of the west wing is a small quadrangle, built in the seventeenth century, about 40 ft. by 50 ft., consisting principally of the offices. This little quadrangle is most picturesque, but has been considerably marred by a modern kitchen, which is not beautiful, and which protrudes upon the otherwise square open space within the buildings.

The main quadrangle was 81 ft. square inside, and the height from the ground to the top of the parapet is about 32 ft. The effect is now very good, but there can be little doubt that the demolition of the north side has made the house more pleasant to live in, and that the space, when entirely closed in, would not have been quite large enough (for its height) to be as cheerful as it is at present.

The terra-cotta is, of course, one of the most interesting features of the building. "In all," says Mr. Frederick Harrison, in his most sumptuous history of the house ("Annals of an Old Manor House"), "about forty or fifty different moulds appear to have been used. . . . Besides this about six other moulded plaques are used in various combinations." The mouldings and outline of the work are distinctly Gothic. The ornament consists of arabesques similar in character to French work of the time of Francis I., and it was probably the design of an Italian hand.

The texture of the terra-cotta is much rougher than our modern terra-cotta, and the difference is much to its advantage in an artistic sense. The blocks are solid, and have considerable twists in what purport to be straight lines. The colour, which was "originally prepared," says Mr. Harrison, "in several shades of red and orange, has now been softened by age and exposure into a rich assemblage of different hues—red, brown, russet, chocolate, orange, salmon, and straw colour." Some of the blocks where broken appeared very similar to a fine-grained sandstone, such as the Horsham stone. The main and important difference between this old and our modern material appeared to the writer to be the greater roughness of the surface texture of the old and the consequent power it has of enabling lichen and mossy growths to adhere to and flourish upon its surface.

There is a good deal of old oak panelling in the house. The rooms also contain a large quantity of old tapestry and interesting old furniture; these are the property of Mr. Harrison. Other interesting details are the typical Elizabethan oak overmantel in the great hall, and the carved, painted, and gilded stone fire mantels in the great and little halls; also some pretty, ornamental, leaded glazing in the first floor windows in the south-west corner of the quadrangle.

The gardens surrounding the house are very beautiful and afford many exquisite views of the latter. They are enclosed by a good many furlongs of old red-brick walls, which are gay with roses, climbers, fruit trees, and, not least, clinging wall plants, moss, and lichen. The walls of the house have most beautiful red bricks, 10½ in. to four courses, with joints of white-mortar about ½ in. to ¾ in. thick. The surface of the bricks is very rough, adding greatly to the beauty of the appearance. The original surface seems in great part to have weathered off, and the colour is a rich, deep red, but varied greatly and enhanced by the moss and lichen which grow upon it. In the garden is a very picturesque little

building, an octagonal lodge with sides about 5 ft. long each inside. This is one of eight lodges which are believed to have formerly existed. There are many exquisite borders, long, straight, and wide, margined with turf or box, and filled with masses of fine and beautiful plants mixed together in the greatest profusion.

After the visitors had seen all these beauties they were directed by Mr. Harrison by a short cut towards Guildford. Arrived there, a portion went to see further interesting buildings. The writer of this notice, however, returned to town, so that he is unable to say what they saw.

It only remains to add that the kindly courtesy of Mr. Harrison and all the information he gave about this most delightful old place was very greatly appreciated by his visitors, and to him their very hearty thanks are due, both for his permission to see it and for his kindness in coming down from town in order to show it to them himself.

MAGAZINES AND REVIEWS.

The *Art Journal* is almost entirely a Royal Academy number, written by Mr. A. C. R. Carter, and illustrated by a number of reproductions of the year's pictures. Mr. Onslow Ford's fine statue, "Knowledge," furnishes the frontispiece.

One of the most interesting articles in the *Magazine of Art* is the notice of Mr. Drury's work at Barrow Court, where the stone piers of a semicircular railing have been treated by the sculptor with terminal heads of "The Months," a fine series of decorative busts. Miss Charlotte F. Yonge contributes an article on "Rood Screens in England," illustrated from photographs, and Mr. Henri Frantz one on "A Great Goldsmith," Lucien Falize, who died a few months ago.

The *Studio* (May 15) gives a well-illustrated article on the work of M. Rodin, the French sculptor, and another on the animal studies of Mr. Henry Moore the great sea-painter, who, it will surprise many to learn, gave a great part of his artistic life to the study of animals, before he became chiefly known as a sea-painter. A number of reproductions from his animal studies are given.

The *Genealogical Magazine* commences in this month's number a Dictionary of the Terms used in Heraldry, which will be useful to many students.

As part of a series on "Unknown Sketching Grounds" the *Artist* devotes an article to Pinner and its neighbourhood, with some sketches by Mr. Harrison Miller which prove that there is sketchable material in the neighbourhood. A largely illustrated article on "Max Klinger, visionary, painter, and sculptor" is of considerable interest from the strange and weird character of Klinger's designs which accompany it.

The June number of *Dekorative Kunst* contains a number of beautiful representations of, for the most part, portentously ugly objects. The principal article deals with modern French furniture, and is illustrated by a large number of photographic plates of specimens, few of which are pleasing, and at least one of which is a perfect delirium of hideousness. The subjects illustrated in the minor articles—the Paris Salon, Belgian works of art, and French medals—are little or no better; a little meditation of the Queen of Holland is perhaps the most pleasing picture in the entire number. The printing of all the letterpress in italics, in this magazine, seems rather a piece of affection. The illustrations are useful as records of the vagaries of design which now seem to be invading all countries alike, but the spectacle is not a gratifying one.

In *The Antiquary* Mr. Lewis André concludes his essay on "Old Sussex Farmhouses and their Furniture." Among "Notes of the Month" Miss Florence Pencock makes an interesting communication concerning an old piece of Flemish tapestry, believed to be, the writer says, the only piece of tapestry known which contains illustrations of the story of The Prodigal Son. A small illustration of it is given.

The *Nineteenth Century* contains an admirable article by Sir Martin Conway on the "Fine Art of Living," a kind of article which unfortunately few English readers will appreciate, though it would be better for them if they did. His point is that there is no general perception among us of an artistic side of life at all. "In Florence, when Cimabue finished his first

great Madonna, the whole town of Florence went *en fête*; no English town can be conceived of as behaving in a similar manner." The article is full of good sense, but unfortunately the only people who will read it or care about it are the small minority who do not require such teaching.

The *Century* contains an article on "Toledo," with numerous sketches by Mr. Pennell, whose style is very well adapted for giving the character of ancient Spanish architecture. "Pictures for Don Quixote," an article by Mr. W. D. Howells, introduces some very clever unpublished drawings by Vierge; and Mr. Fenollosa concludes his essay on "An Outline of Japanese Art."

In the *Revue Générale* an article by M. Verliant, "En Allemagne," is illustrated by reproductions of some rather out of the way ancient churches, &c., of North Germany.

The *Fortnightly* contains an article on "The Paris Salons" by Mr. H. Heathcote Statham.

In the *National Review* Mr. D. S. Maccoll writes some critical reflections "Among the International Artists," i.e. the show at the Knightsbridge Skating Club, which strikes us as a somewhat wrong-headed piece of criticism. The author, among other things, characterises M. Dagnan-Bouveret as "Mr. Herbert Schmalz de l'outre-mer" (!), a remark which is in itself enough to show that his article can hardly be taken very seriously.

The *Gentleman's Magazine* includes a rather interesting article on "The Appointments of Manor Houses in the Seventeenth Century," their furniture and other equipments, the information being derived from some old inventories.

The *English Illustrated Magazine* has an article, under the title "Very like a Whale," on mediaeval representations of animals, with some delightful specimens reproduced from an old book entitled "Ortus Sanitatis," published at Strasburg in 1490.

We have received *Harper and Scribner*, but they contain nothing this month on which we need comment, except a couple of reflections, in the latter, on "Landscape-painters and the Summer," under the heading "The Field of Art." We have received also *Knowledge* and *The Quarry*.

ARCHITECTURAL SOCIETIES.

YORK ARCHITECTURAL SOCIETY.—The annual election of officers of this Society has resulted as follows:—President, Mr. George Benson (York); Vice-presidents, Messrs. C. H. Channon, Malton, and Mr. J. T. Pegge, York. Hon. treasurer, Mr. Wm. Hepper; hon. librarian, Mr. S. G. Highmoor; hon. secretary, Mr. A. B. Burleigh. Committee, Messrs. J. Ferguson, A. Hirst, T. Monkman, A. J. Plenty, and E. A. Pollard.

EDINBURGH ARCHITECTURAL SOCIETY.—At a meeting of this Society on the 1st inst., a lecture, entitled the "Grammar of House Planning," was delivered by Mr. J. J. Henderson, representative of the Dundee Institute of Architecture, Science, and Art. Mr. William N. Cumming, the President, occupied the chair. Mr. Henderson treated his subject from a practical point of view, dealing first with general principles, site, prospect with a view to health, nature of soil, drainage, &c. The lecturer drew particular attention to the necessity of frequently consulting the client as to his requirements during the progress of the design.

EDINBURGH ARCHITECTURAL ASSOCIATION.—On the 4th inst. the members of the Edinburgh Architectural Association, to the number of between forty and fifty, accompanied by the President, Mr. Thomas Ross, and the secretary, Mr. Hunter Crawford, visited Alloa. The party inspected the public baths and gymnasium. Mr. John Burnett, A.R.S.A., Glasgow, the architect of the building, acted as guide to the party, and explained all necessary details. Alloa Park and mansion were next visited, and, through the kindness of the Earl of Mar and Kellie, the excursionists were conducted over Alloa House and the garden and grounds. His Lordship personally undertook this duty, and afterwards entertained the company to lunch in old Alloa Tower. In the afternoon visits were paid to two of the most recent additions to the gentlemen's seats in the district, viz. Greenfield House, the residence of ex-Provost Thomson, and Inglewood, the residence of Mr. Forrester Paton—the architect of both, Mr. Sydney Mitchell, Edinburgh, giving all necessary explanations. The company also visited the

Town Hall and Public Library, and Alloa Parish Church. Mr. Forrester Paton entertained the excursionists to tea in the Museum Hall.

GLASGOW INSTITUTE OF ARCHITECTS.—A meeting of this Institute was held on the 2nd inst. in the secretary's chambers, 115, St. Vincent-street—the President, Mr. John James Burnett, A.R.S.A., in the chair. The Secretary read a correspondence he had had with the general manager of the Glasgow International Exhibition, 1901, regarding the conditions of competition for the buildings, and the meeting was informed that, mainly as a result of the action of this Institute, the professional members of the Building Committee, together with the convenor and vice-convenor, had been appointed a special committee to examine the competitive plans when received and to report. The Secretary also stated that he had furnished Mr. Hedley with the names of all the architectural bodies in Scotland and the North of England to whom it had been arranged that plans and conditions of the competition were to be sent free of charge, intending competitors being also entitled to get copies on payment of one guinea, which would be returned on receipt of a design. The Architects' Registration Bill was remitted to a committee for examination and report. The Vice-President, Mr. David Barclay, and ex-President, Mr. W. Forrest Salmon, were elected governors of the Glasgow School of Art, and it was agreed to renew the prizes given by the Institute to the School of Art and Technical College.

COMPETITIONS.

TROWBRIDGE TECHNICAL SCHOOL.—Sixty-seven designs have been sent in in this competition, and they were to be exhibited in the Town Hall, Trowbridge, on Thursday, Friday, and Saturday of this week. Mr. Thomas Davison, of Great Ormond-street, London, is the successful competitor.

WORKHOUSE, KIRKHAM, LANCASHIRE.—On the 1st inst., at the Kirkham Workhouse, the Fyde Board of Guardians held its usual fortnightly meeting. The Finance Committee reported that they had passed for payment, amongst other accounts, the three premiums awarded to architects in the matter of a competition for the design of a new workhouse. The Chairman announced that they had also approved the alteration to the second premium plan, which it had been decided to accept as the design for the new workhouse. In the alterations there had been nothing taken from the plan that received the first premium, though there had been an idea taken from the plan that received the third premium.

VICTORIA PARK, TIPTON.—At the last meeting of the Tipton Rural District Council, the Parks Committee reported that they had inspected ten plans for the laying out of the new Victoria Park. The first premium of 25l. had been awarded to Messrs. W. Barron & Son, Derby, and the second to Mr. John Berry, architect, Tipton. The Committee recommended that the park be laid out in accordance with the first-mentioned plans, the cost not to exceed 4,500l.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting of this Institute, held on the 1st inst., Judge Baylis, Q.C., in the chair, it was announced that Viscount Dillon had resigned the Presidency of the Institute, and that the position had been offered to Sir Henry Howarth, M.P., who had intimated his willingness to accept it. The nomination of President was unanimously confirmed by the meeting. Mr. George E. Fox, F.S.A., described the mosaic floors in the house of M. Cæsius Blandus in Pompeii, and exhibited a tracing from one of them, giving also a brief account of the baths in some of the principal houses of the City. Professor Flinders Petrie was announced to give a description of excavations at Denderah, but it was explained that he was unable to be present owing to illness. His place was taken at short notice by Mr. Fox and Mr. F. Davis, who gave a description of a dwelling-house only recently uncovered during the excavations on the site of the old Roman city at Silchester. This was one of the largest houses which had yet been discovered. It was of the courtyard type. One of the rooms contained a fragment of a fine mosaic pavement. As the work is now in progress, further discoveries are still to be looked for, not only in this house but also in some half-

dozen acres still to be explored this year. Mr. Mill Stephenson, F.S.A., read some notes on the palimpsest brass at Okeover, Staffordshire. This brass was originally laid down to the memory of William, Lord Zouch of Haryngworth, on the death of his first wife, Alice Seymour, in 1447, and in 1538 was converted into a memorial to Humphrey Oker and his wife and family.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The closing meeting of the session was held at 32, Sackville-street, on the 1st inst., Mr. C. H. Compton, V.P., in the chair. After the exhibition of some coins and other objects of interest, Mrs. Collier read a paper upon the Church of St. Crantock in Cornwall, which was a well-endowed collegiate church before the coming of Saint Augustine. At the dissolution it possessed nine prebends and was rated at 19l. 3s. 6d. The church is quaint and rudely designed, and has remains of very early work. The paper was well illustrated by drawings and photographs. The Rev. Lach-Szirma then read a paper upon the "Preservation of Antiquities," in which he forcibly demonstrated the duty of carefully preserving antiquities of every kind, and protecting even those of remote and out of the way places as bestowing on the locality special historical, antiquarian, or artistic interest. Our national antiquities formed a part of the heritage of the ages, which the nation had received from generations long gone by. We were very much behind other civilised European nations in the steps we had taken for the preservation of our national antiquities. In France the vote for preserving or purchasing antiquities was usually 50,000l. per annum, while England could only afford, under Sir J. Lubbock's Bill, 100l. for expenses, and 250l. for Inspector's salary. The author considered that in England an Act of Parliament should be passed requiring the license of the Home Secretary, or other high official, for permission to destroy or mutilate any edifice, or other monuments, erected before the reign of Queen Elizabeth, and this limit might subsequently be extended to include all seventeenth century buildings and monuments. He also thought that the Presidents of the chief Archæological Societies ought to be consulted before a license was issued.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of this Society, held at the Royal United Service Institution, Whitehall, on the 6th inst., Mr. W. Worby Beaumont, President, in the chair, a paper was read by Mr. Edward A. Harman, entitled "Gas Works Machinery." The author first pointed out the close relationship of gas works machinery with other branches of engineering. Attention was then directed to the deteriorating influences to which gasworks machinery was subjected, on account of coal and coke dust, and the presence of miscellaneous waste gases. The author pointed out the severe conditions under which some portions of the machinery had to be operated, such as the handling of red-hot coke at a distance of 2 ft. or 3 ft. from the face of the machine; he also referred to the influence of contraction and expansion on the various parts of the machinery, due to working under variable temperatures. Attention was then drawn to the special objects of gasworks machinery, and to the numerous novelties existing in gasworks. The exhausting plant used was explained at length; the author combatting the common erroneous idea that atmospheric air was drawn into the gas, and explaining the functions of the exhaustors for drawing the gas from the hydraulic main, leaving the dip pipes always sealed; and for forcing the gas through the purifying apparatus; and also for raising the gasholders. The difficult duty required from pumps was referred to, namely, that of having to raise substances ranging from light spirits to almost thick solid matter, at various temperatures from zero to nearly boiling point. The coal and coke stacking operations were then reviewed, attention being called to Mr. Marshall's extensive installation at one of the Copenhagen gas works, for the Danish Gas Company, which is capable of unloading and stacking about three quarters of a million tons of coal in six months. The Temperley transporters were also described. Coke conveyors were considered, special reference being made to that designed by Mr. Henry Hack, M.Inst.C.E., at one of the Birmingham gas works, and to the design of M. de Brouwer, of Bruges. Coke breakers with circular steel sheets were stated to be

most desirable for cutting the coke, instead of crushing it. Gas engines and tramcar motors were also considered, regenerative furnaces were stated to be considerably reducing the consumption of fuel on gas works, while giving higher heats and vastly better working results. Lifting and travelling apparatus for purifier covers was stated to be generally worked by hydraulic power. The recovery of the large quantity of waste upon gas works was mentioned as being gradually coped with, such as the quantity of gas lost during the operations of charging the retorts, the coke dust, spent lime, waste hot water from various processes, and also the unrecovered cyanides in the coal gas. Stoking machinery was dealt with at length, Mr. West's compressed air system being first described, and afterwards the Arrol-Poulis system. Coal breakers, elevators, and conveyors were also described. The depreciation of gas works machinery was regarded by the author as not being greater than with other machinery, as the wear and tear of the renewable portions had to be made good as required. The author, in conclusion, stated that he considered that rule-of-thumb methods were rapidly giving place to systematic methods and design. The paper was very fully illustrated.

MUNICIPAL ENGINEERS AT THE NEW BRADFORD WORKS.

THE Association of Municipal and County Engineers held a Yorkshire district meeting on Saturday, June 4, for the purpose of visiting the works which are in progress in the Nidd Valley for the supply of water to the town of Bradford. The scheme is one of great magnitude, and the interest of municipal engineers in the work was evidenced by the large attendance of members. In the absence of the President (Sir A. Binnie), Mr. C. H. Lowe, of Hampstead, was the acting Vice-President, and amongst others present were Messrs. Cartwright (Bury), Cooke (Lancaster), Hopkinson (Keighley), Stead (Harrogate), J. W. Spencer (Newcastle-on-Tyne), T. W. Stainthorpe (Eston, honorary district secretary), J. H. Cox (Bradford), Watson (Bradford Water Engineer), and many others.

The members attending the meeting, who had stayed overnight at Harrogate, on arrival at Pateley Bridge were received by Alderman Houldsworth and the members of the Bradford Waterworks Committee, thence driving to the dam of the Gouthwaite Compensation Reservoir. The work at this point is far advanced, the dam being nearly completed, and a good idea is given of the compensation reservoir, which will form a lake two miles in length. Mr. J. Watson, C.E., Waterworks Engineer, gave the following description of the Nidd Valley scheme and the works which are in progress:—

These works, for which Parliamentary powers were obtained in the Sessions 1891-92, are as follows: Three reservoirs on the River Nidd for storage and supply of the City of Bradford on the south-eastern side of Little Wharfedale.

- (1) Angram Reservoir, situate at an altitude of 1187.50 ft. above ordnance datum, having an area of 69½ acres, an available depth of 112 ft., and a capacity of 810,000,000 gallons.
- (2) Lodge Reservoir, at an altitude of 1,098 ft., top water area 84½ acres, available depth 104 ft., capacity 1,088,000,000 gallons.
- (3) High Woodale Reservoir at an altitude of 904 ft., top water area 72½ acres, available depth 61 ft., and capacity 698,000,000 gallons.

Or a total storage of 2,596,000,000 gallons. The united drainage area to these three reservoirs is 6,800 acres.

In addition to the drainage to these reservoirs there is a drainage area of 11,400 acres which drains to and is intercepted by the main aqueduct, into which the waters of the following noted streams are taken, viz.: Ruscoe Beck, by 616 yards of 12 in. diameter pipes; Howstone Beck, by 900 yards of 24 in. diameter pipes; Blayshaw Gill, by 217 yards of 18 in. diameter pipes; Ramskill, by 1,328 yards of 24 in. diameter pipes; and Colthouse Beck and a number of smaller streams direct into the aqueduct. The main aqueduct is 32 miles in length, and consists of 11½ miles of aqueduct 5 ft. 6 in. wide by 6 ft. 3 in. high in cut and cover constructed in concrete; 6½ miles of tunnel lined with concrete (also 5 ft. 6 in. by 6 ft. 3 in. inside), and about 14½ miles of cast

iron and steel pipes 36 in. diameter, of which 5,281 yards or 3 miles are steel pipes weighing 1,800 tons, and the remaining 11½ miles cast iron, weighing 13,000 tons. At a point 16 miles distant from its commencement the main aqueduct is joined by a branch pipe 30 in. diameter and 2½ miles in length, from which water can be drawn from the Upper Barden Reservoir to the Chellow Heights Reservoir in Bradford, or by which Nidd Water can be sent into Lower Barden Reservoir. At a distance of 18½ miles from its commencement, a pipe 18 in. diameter, 370 yards long, is taken to Chelker Reservoir, and at a distance of 22½ miles, the Doubler stones branch, 6 in. diameter, is joined to the main aqueduct, 2,136 yards long. The total length of branch aqueducts is about 6 miles. The main aqueduct delivers into two reservoirs at Chellow Heights, at an altitude of 845 ft., having a capacity of 61,000,000 gallons. Five filter beds are to be constructed at each of these reservoirs for filtering the water before delivery into the city. In the construction of the works seventeen bridges have been erected for carrying pipes and aqueducts over valleys, rivers, and canals. There are five intake dams constructed of masonry for damming back streams which are brought into the main aqueduct by the branch aqueducts noted, on each of which are placed separating weirs, and the upper end of each syphon is controlled by automatic valve apparatus to stop the flow in case of accident.

The Gouthwaite Compensation Reservoir, situate on the River Nidd about 2½ miles above Pateley Bridge, will form a lake some 2 miles in length, top water level of central bays 446 ft. O.D., and side bays 447 ft. O.D., depth at dam face 42 ft., storage capacity to 446 ft. O.D. 1,540,000,000 gallons. The masonry wall or dam is constructed of cyclopean rubble in cement, maximum depth from foundation to top water level 105 ft., the thickness at the base being 70 ft.; on the up stream side the wall has a batter of one in sixteen, with a curved batter on the down stream side, face and back of dam formed with large squared pitch faced blocks of hard grit stone. The overflow is carried over the crest of the dam through fourteen arches each 35 ft. 6 in. span, over and upon which arches a carriage road is formed 10 ft. in width. The parapets of the road are of pierced and moulded ashlar. Two culverts each 10 ft. diameter are constructed through the wall of dam controlled by valves and outlet pipes fitted up in two valve towers of masonry, lined with cast-iron erected on the inner side of the dam. The drainage area to this reservoir is 9,900 acres, which is set apart as a compensation area for supply to those having mills, riparian, or other interests in the stream below. The public road on the westerly side of the above reservoir has been diverted for a length of 3,050 yards, and the occupation road on the easterly side for a length of 983 yards. The quantity of masonry and concrete in the masonry dam is about 70,000 cubic yards. The aqueduct and tunnel will carry 27,000,000 gallons per day, but one line only of 36 inches diameter pipe is now being laid, which will carry 10,000,000 gallons per day. The estimated cost of the works when completed is 1,370,000l. The contractors for the aqueduct and tunnel works are Messrs. Morrison & Mason, Glasgow; for the Gouthwaite Reservoir works, Mr. John Best, Edinburgh; for cast-iron pipes, Messrs. Cochrane, Grove, & Co., Middlesbrough; for steel pipes, Messrs. Timbrell & Co., Birmingham; for service reservoir filter beds, &c., Mr. Phineas Drake, Bradford; for valves and other iron work and appliances, the Glenfield Company, Kilmarnock.

The members then proceeded to the railway which has been constructed alongside the valley, for the purpose of a thorough inspection of the whole of the works; and it was during this journey that Mr. William Tulley, surveyor, of Rothwell, near Leeds, rolled over and fell on to the side of the track in what was believed to be a fainting seizure or fit. The train was immediately brought to a standstill, the members at once hurrying to render assistance, only to find that Mr. Tulley was dead. The body of the deceased was conveyed to the Crown Hotel at Lofthouse. The shock of the tragic event deeply affected all the members attending the meeting.

On returning to Pateley Bridge the members were entertained to dinner by the Bradford Waterworks Committee, Alderman Houldsworth, Chairman of the Committee, presiding;

but in view of the sad event which had happened, the proceedings were commendably brief.

Alderman Houldsworth and other speakers expressed grief at the sad death of Mr. Tulley, and sorrow with the relatives.

Correspondence.

To the Editor of THE BUILDER.

RIVERSIDE FOUNDATIONS.

SIR,—With reference to the paper on foundations read before the Architectural Association, and reported, with discussion thereon, in your issue of May 28, it may be of interest if I describe the form of foundation now being completed by the Co-operative Wholesale Society for their new flour mill at Silvertown.

The site immediately adjoins the Thames, and the foundations are formed on land reclaimed from the sloping bank of the river, consequently it was found necessary to excavate through made ground and river mud to a depth of 25 ft., at which level a bed of river ballast has been reached.

As the land is full of water up to its surface, excavating in the ordinary way could not be carried out; therefore cast-iron cylinders, sixty-eight in number, have been sunk at intervals of from 15 ft. to 18 ft. over the whole area of the buildings, and so disposed as to come under the main walls and certain of the iron columns supporting floors and wheat silos. The cylinders are 5 ft. 6 in. in diameter, and in sections of 6 ft. bolted together. The earth was excavated from the interior of these as the sinking proceeded, the water being pumped out by steam pumps as fast as it accumulated, and upon their reaching the ballast the cylinders were filled up with cement concrete.

Upon these cylinders has been laid a network of rolled steel joists and railway bars, the joists under the walls and columns, and the railway bars across the intervening spaces; and the whole building area, from the top of cylinders and 4 ft. in thickness, has been laid with a platform of cement concrete, which encases the above-mentioned steelwork.

The wall foundations and column bases will rest directly on this concrete bed, and bearing in mind the probability of the made ground settling down, we believe we are independent of this, seeing that the whole of the weight of the buildings will be transmitted through the concrete columns to the ballast below the river mud.

FRANCIS E. L. HARRIS, A.R.I.B.A.

* * The last paragraph of Mr. Harris's letter, we may observe, forms a good practical answer to the question which was put during the discussion on Mr. Walmisley's paper, why it should be necessary to supplement a concrete foundation by carrying piers down to a lower stratum.—ED.

WALTHAM ABBEY.

SIR,—May I be allowed to correct an error in Mr. Reeve's letter published in your last issue, wherein he credits me with classing the monastic church of Carlisle as an admittedly Saxon building, which is not the case. My argument is, that in buildings of the same date throughout, the walls are practically of similar thickness throughout. It is so in the admittedly Saxon churches, where the walls are thin; it is so in the Norman churches of Caen, and of England, where the walls are thick. The two marked exceptions are Waltham and Carlisle, whence I conclude that the aisle walls of these two churches are not of the same date as the walls of the arcade.

CHARLES J. FERGUSON.

* * We think there will hardly be anything gained by continuing this controversy further at present.—ED.

THE LONDON AND PROVINCIAL BUILDERS' FOREMEN'S ASSOCIATION.—In opening the proceedings (through the illness of Mr. Morgan, the Vice-President) of the usual monthly meeting of this Association, at the Memorial Hall last Saturday evening, Mr. G. Barclay, the immediate past President, said he had a most sorrowful duty to perform, and one he felt sure would elicit their most heartfelt sympathy. When he informed the members that since their last meeting they had had the misfortune to lose by death their dear and respected President, Mr. Morley, he felt sure there would be but one feeling, "that the Society had lost a good and faithful President, a most genial and pleasant member, and a dear friend." One of the founders of the Association, Mr. Morley had worked hard for its success, in committees and otherwise, and had taken a deep interest in all its proceedings. He was a great advocate for the higher training of our future mechanics, and it was principally on his initiative that several of the members of the Association were now giving their services in assisting the members of the technical classes in the metropolis in the practical part of the instruction given.

Illustrations.

ADDITIONS, "RED HOUSE," AYR.

ADDITIONS to this house were made during the past and present years. The drawing in the Royal Academy, from which the illustration is taken, shows the addition first proposed. Its purpose, besides enlarging the house, was to secure a greater south and west frontage, and to open up a more extensive sea view, including also, from the upper windows, part of the Carrick range of hills and the prominent headlands known as the "Heads of Ayr."

A bulb garden would have been laid out in the square plot of ground formed by the return frontages of the house; adjoining it, a sunk garden for roses; and beyond, a succession of lawns and gardens following the line of a broad central walk, accentuated at points of intersection by sundials or lead figures. The various gardens would have been divided from each other by clipped hedges and bowers. The gardens are at present being laid out.

JAS. A. MORRIS.

HEAD OFFICES FOR THE METROPOLITAN ASYLUMS BOARD.

THIS building is about to be erected on the Victoria Embankment near the Temple, with a frontage of 93 ft. to the river and 127 ft. to Carmelite-street. It is for the head offices of the Metropolitan Asylums Board, and the plan we give is that of the principal floor, for the managers' use as distinct from the staff.

The principal entrance is at the front angle, while there is a secondary entrance to the north-east staircase, giving access to the public gallery of the board-room.

The building is of fire-resisting material throughout, including the roofs. Externally, it is of Portland stone and red bricks. The domes are to be of copper and the roofs of Westmoreland green slates.

The board-room, which is on the first floor, has been designed to accommodate about one hundred members. The room is lighted by clear-story windows on six of the eight sides, and is heated by means of hot-water coils through which the fresh air passes before admission into the room. At one end of the room is a reporters' gallery, and at the other the public gallery. The chairman's seat is placed at one side of the room, all the other seats radiating to it. This room is to be fitted in wainscot throughout.

The contract for the foundations has been taken by Messrs. Leslie & Co., of Kensington-square, but that for the superstructure is not yet let.

The architect is Mr. Edwin T. Hall.

COBORN SCHOOL FOR GIRLS, BOW-ROAD.

THIS building has been erected on the site of Nos. 31 and 33, Bow-road, by the Governors of the Stepney and Bow Foundations, as a middle class day school for 300 girls.

The school stands detached, except as to a portion of its west side, and has a fair-sized playground in the rear. The building is nearly a square on plan, and the general arrangement is shown on the accompanying plan of the upper ground floor. The central Assembly Hall has a gallery round it at the first floor level, and serves for daily assemblage of the pupils, and for purposes of intercommunication between the various class-rooms and departments, as well as for special occasions. It has an open timbered roof, and is top-lighted as well as possessing windows at the ends.

There are altogether ten class-rooms, each with good left-side light.

On the lower ground floor is the pupils' entrance, extensive hat and cloak-rooms, two of the class-rooms, three music-rooms, dining room to seat about 100, kitchen department, stores, and cellars. On the first floor are the remaining class-rooms, one fitted as an art school, with high north light, and on the second floor a technical department, comprising a laboratory, 42 ft. by 21 ft. 4 in., fitted for instruction in chemistry, as well as, at one end, cooking classes, lecture theatre, and apparatus rooms, and in the rear, on the east side, caretaker's apartments.

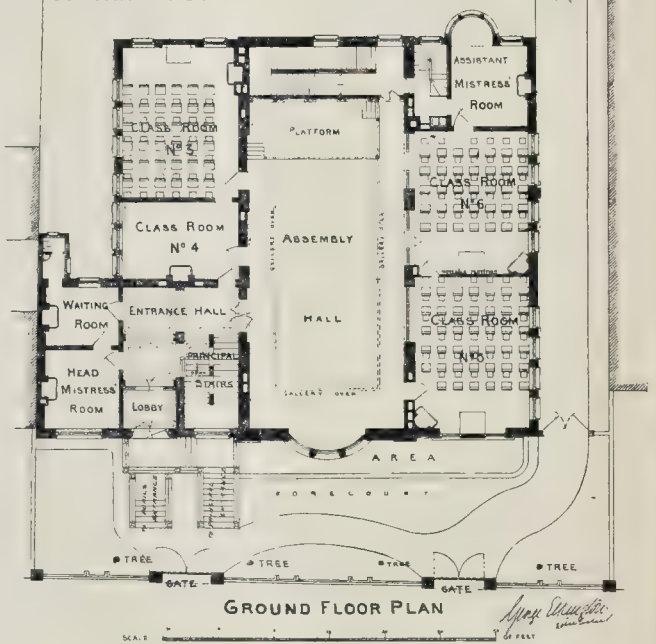
The building externally is faced with red brick and Portland stone; the roofs are slated. The staircases, landings, and corridors are con-



First Floor Plan.

Head Offices, Metropolitan Asylums Board. Plan.

COBORN SCHOOL FOR GIRLS, BOW ROAD, E.



GROUND FLOOR PLAN

structed of fire-resisting materials. The large hall, technical department, class-rooms, and other portions open to the pupils are heated with hot water (small pipe system), supplemented as to the class-rooms by Galton stoves. All the rooms are provided with inlet and outlet ventilation, under control. The artificial lighting is at present by gas, but wires are laid in and preparations made for electric lighting.

The general contract for the building amounts to 13,000l., and is in the hands of Messrs. Jas. Smith & Sons, of South Norwood. Mr. Stainton has carried out the heating and ventilation, and Messrs. Wake & Dean the greater part of the fittings. Mr. Murrell has

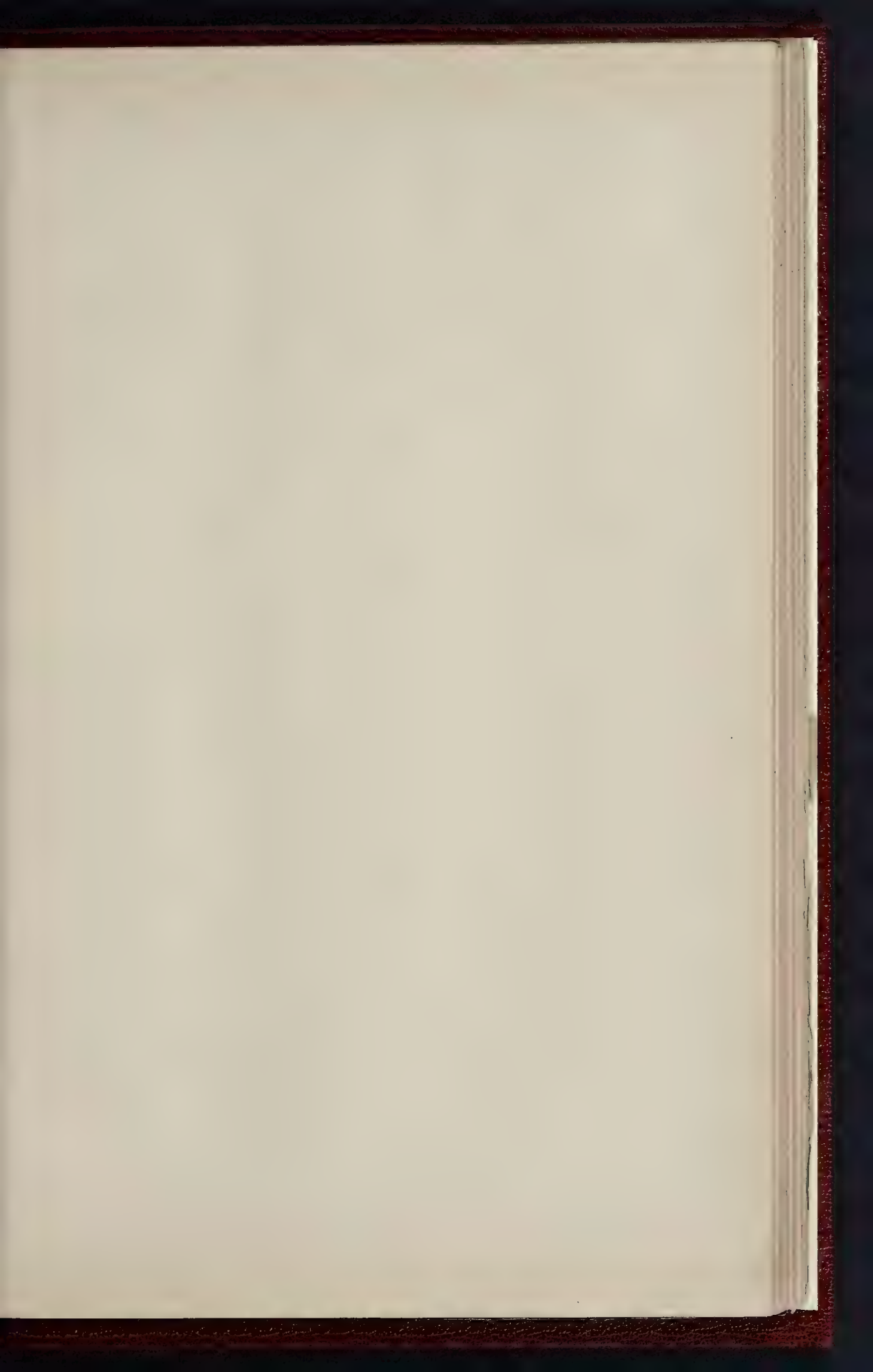
acted as clerk of the works. The architect is Mr. George Elkington.

The works have been in hand for about a year, and the new building has been opened this week.

HEADMASTER'S HOUSE, MERCHANT TAYLORS' SCHOOLS.

THIS building has been erected on the site of the old houses occupied by the headmaster and junior masters of the Merchant Taylors Company's Schools in Rutland-place, Charter-house-square.

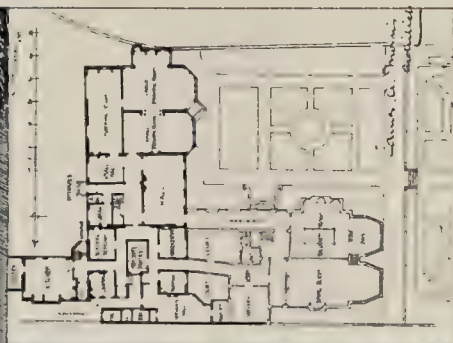
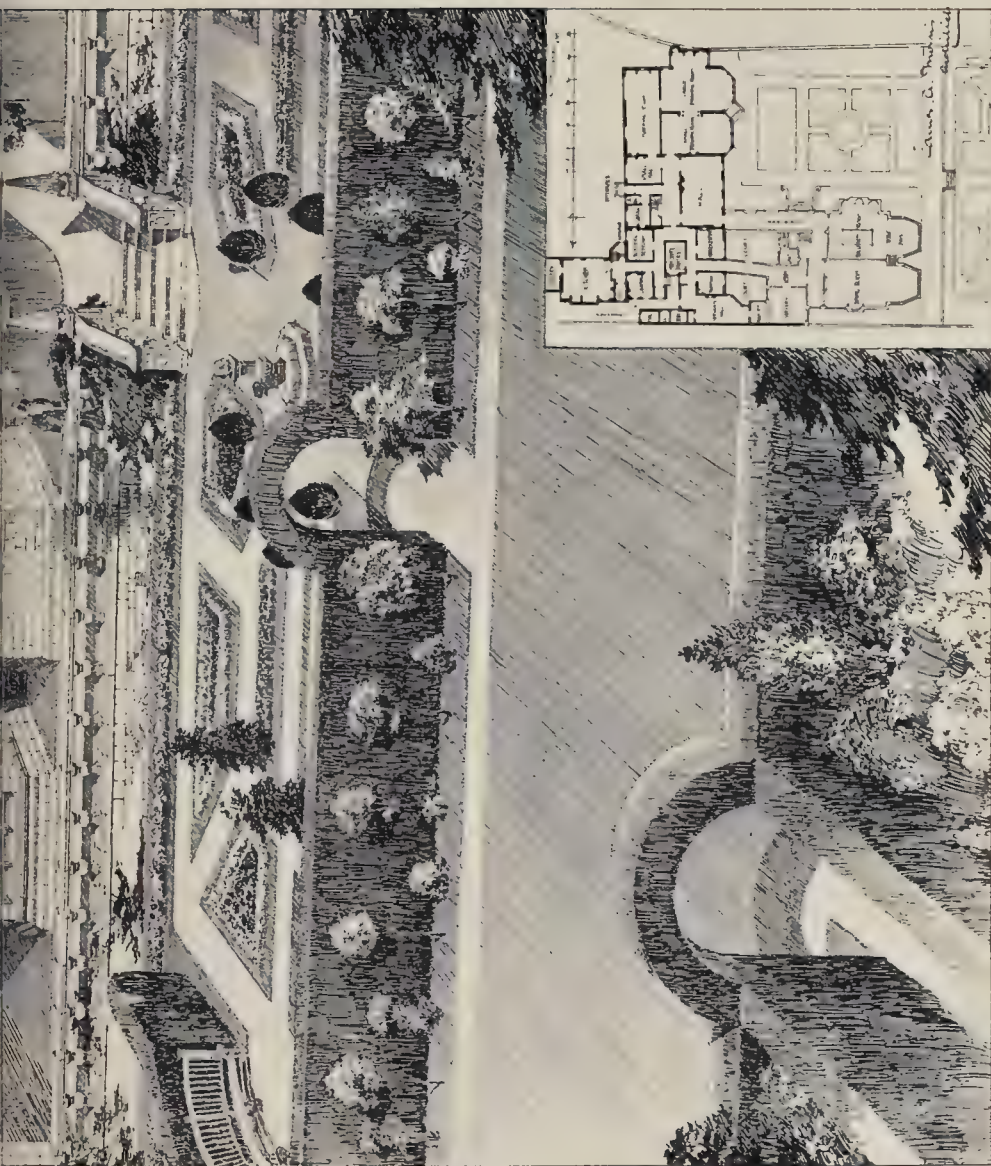
On the ground floor is a spacious entrance-hall with oak panelling and staircase. On



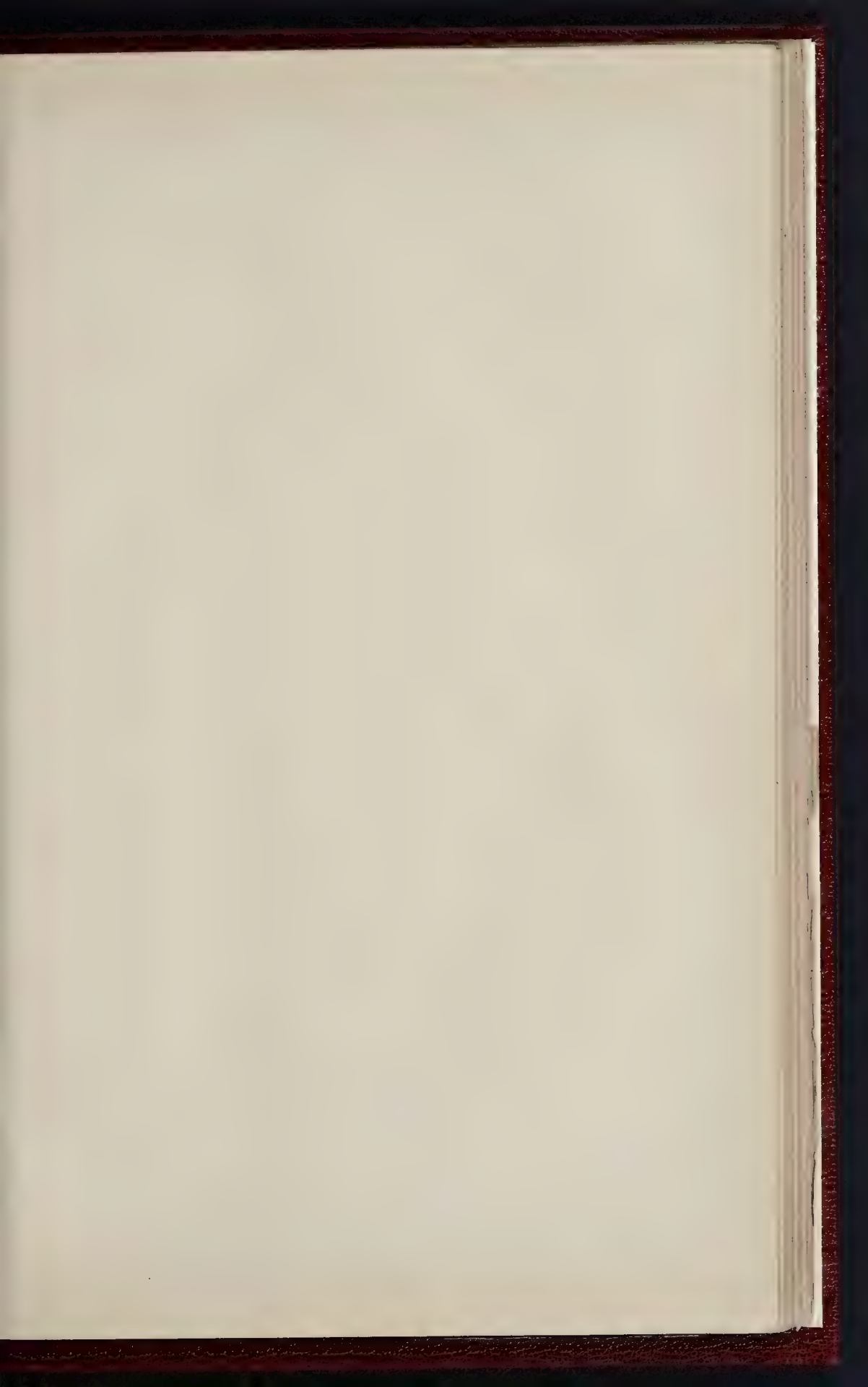
THE BUILDER, JUNE 11, 1898.

*Gardens & Proposed Additions
to "Red House," by:
C. J. Cunningham Esq. F.R.S.*





PLAN AND SPREADSHEET OF THE EAST HARBOR STREET CENTER, LANE 17

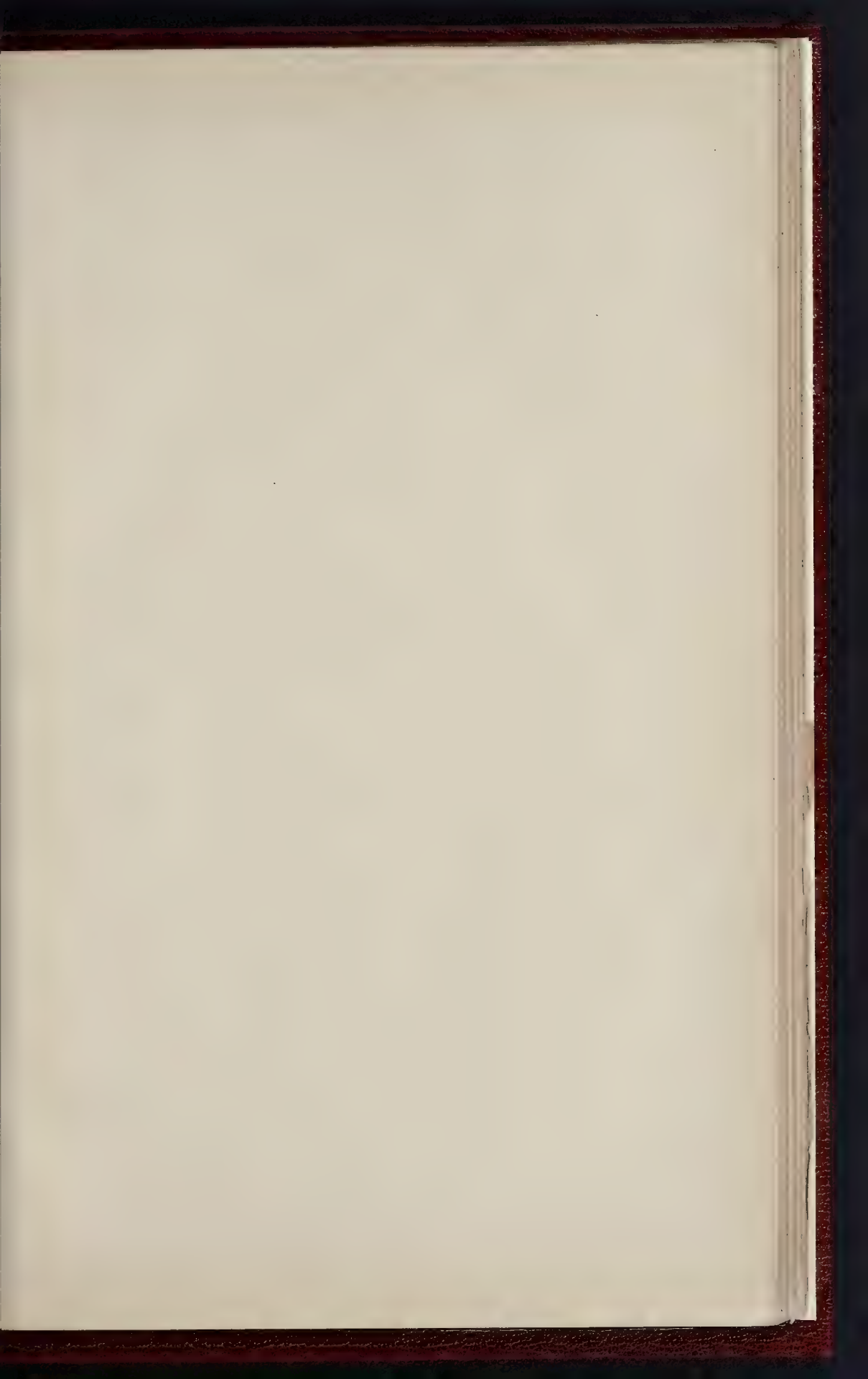




HEAD OFFICES, METROPOLITAN ASYLUMS BOARD, VICTORIA



SKETCHED BY SPRAGG, E.C. 4. 4. 4. EAST HARDING STREET, PETER LANE, E.C.



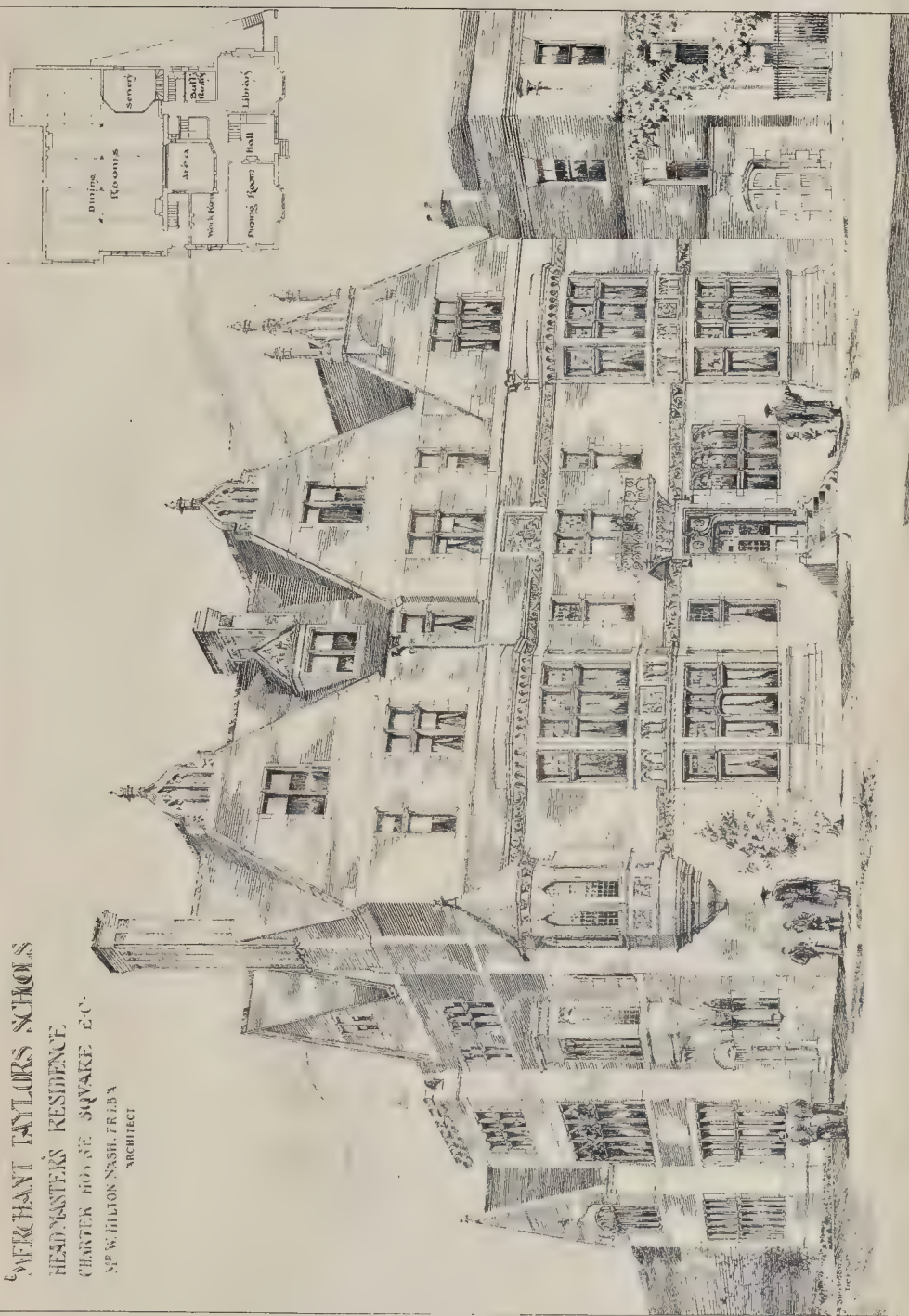
THE BUILDER, JUNE 11, 1898.



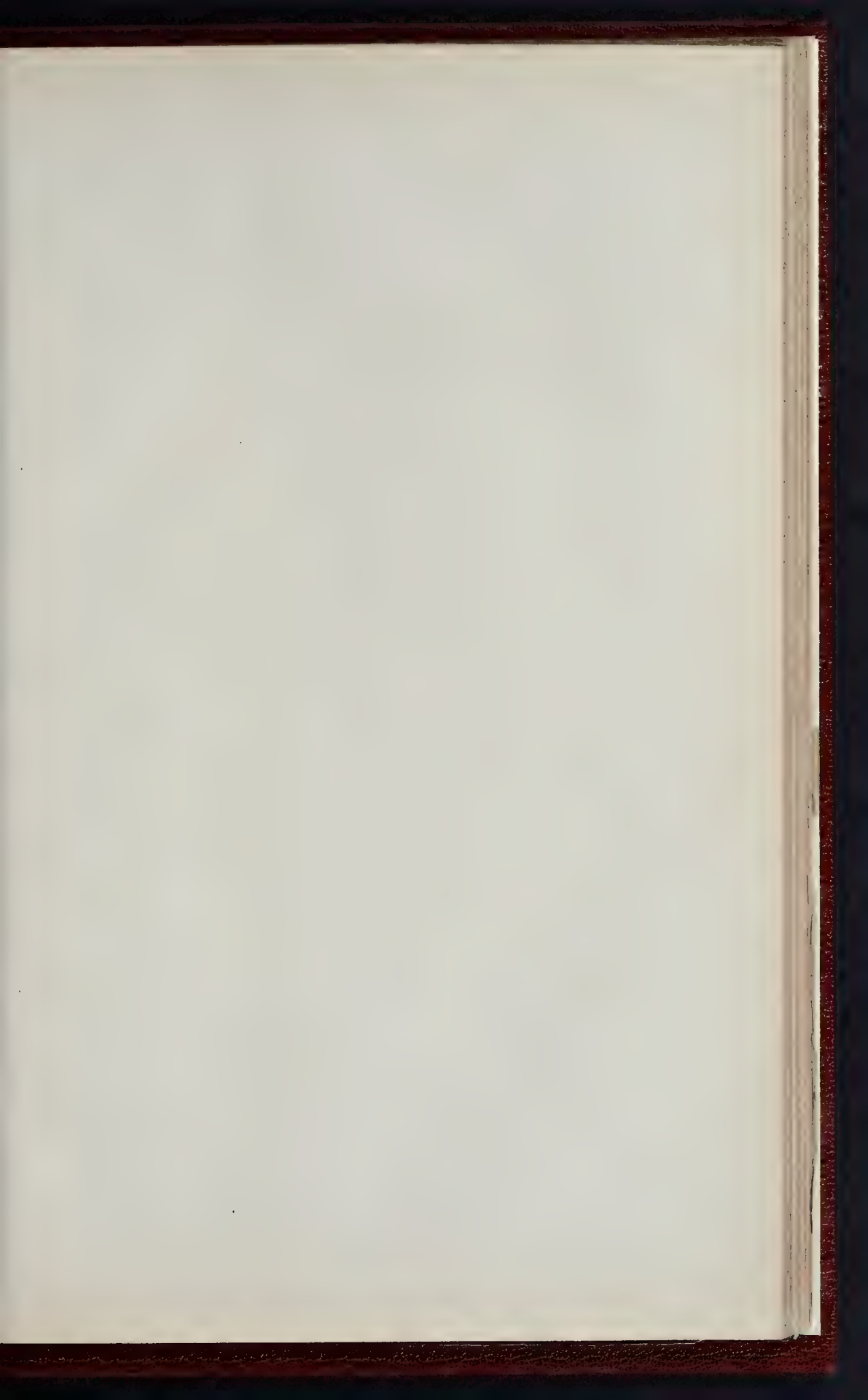
PHOTOGRAPH BY MR. J. H. B. & CO., 44, FETTER LANE, E.C.

CBORN SCHOOL FOR GIRLS, BOW ROAD.—MR. G. ELMINGTON, F.R.I.B.A., ARCHITECT.

MR. HANT TAYLOR'S SCHOOL
HEADMASTER'S RESIDENCE
CHARTER HOUSE SQUARE E.C.
MR. W. HILLION NASH, F.R.I.B.A.
ARCHITECT



DESIGNED BY MR. HANT TAYLOR, F.R.I.B.A. AND MR. W. HILLION NASH, F.R.I.B.A.



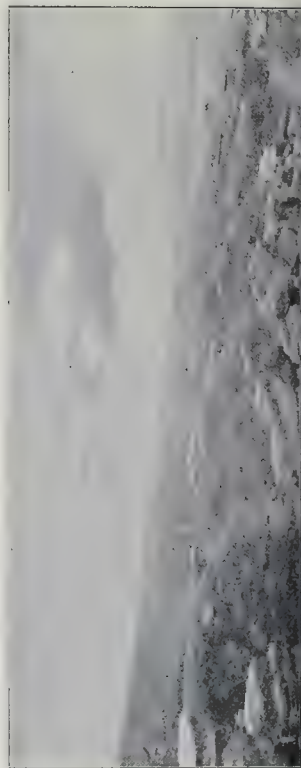
THE BUILDER, JUNE 11, 1908.

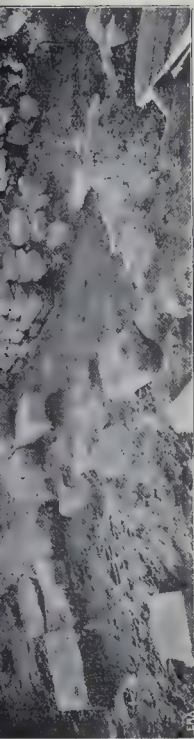


Hypocaust in Camp at Asica, looking towards South Gateway

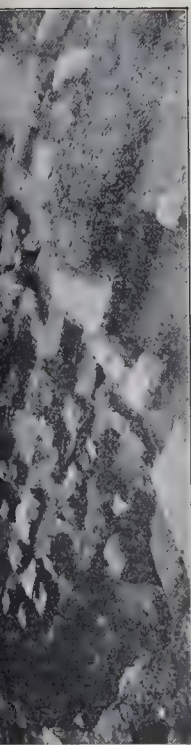


Hypocausts and The looking towards West Gateway, Asica

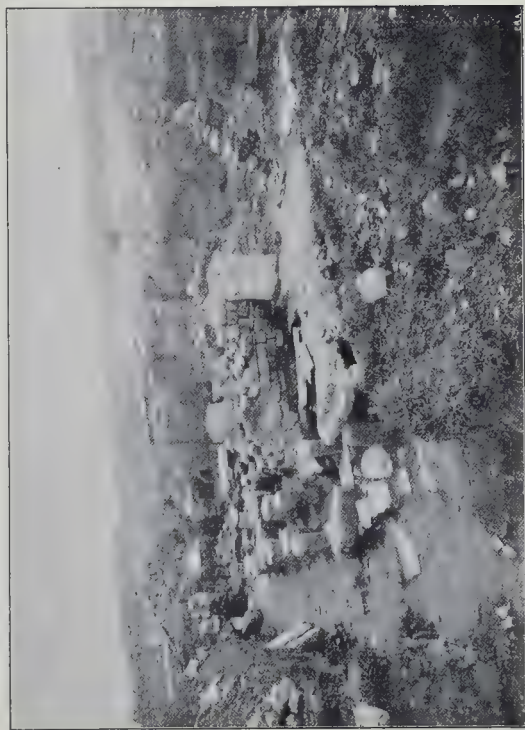




Place where Inscribed Stones were found at Æsica, looking towards West Gateway.



Suburban Building at Æsica, looking North east.



Suburban Building at Æsica, looking West.



Hypocaust and Apsidal End of Room partially excavated in Suburban Building, Æsica

ILLUSTRATIONS TO ARTICLE ON "RECENT EXCAVATIONS ON THE ROMAN WALL, NORTHUMBERLAND."

either side are the dining-room and master's library and a small sitting-room. On the first floor is a drawing-room, with oriel bay window, overlooking the playground. On the upper floors there are nine bed-rooms. The house communicates with the boys' dining and luncheon rooms. The materials used were Portland stone and Monk's Park stone and red brick.

The buildings were erected from the designs and under the superintendence of Mr. W. Hilton Nash, of Cannon-street, and the builders were Messrs. Dove Brothers, of Islington. The carving was executed by Messrs. Butcher & Axtell, and comprises a broad frieze over the ground story, into which the Holy Lamb in Glory (which is the crest of the Company), the Tailors' Scissors, and the Tudor Rose are introduced at intervals. The school is known in old records as the "Schola Mercatorum Scissorum."

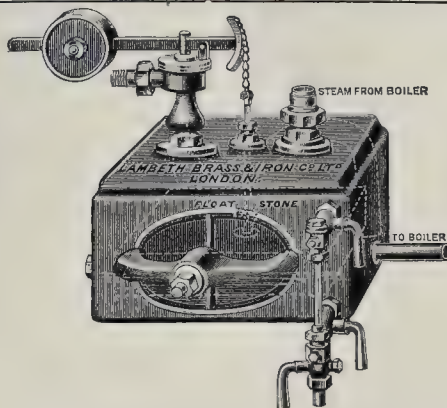
Some of the interior fittings, including a mantelpiece in the dining-room, were made by Messrs. Walker & Sons from the architect's design.

SITES EXCAVATED ON THE LINE OF THE ROMAN WALL, NORTHUMBERLAND.

THESE views of several of the recent excavations on the line of the Roman Wall, Northumberland, on the ancient site of Æsica, are from photographs made in the course of the excavations by Mr. J. Pattison Gibson, of Hexham, who has taken a prominent part in the work. They must be studied in connexion with the leading article in this issue, to which they form illustrations.

TRADE CATALOGUES.

MESSRS. CANDY & Co. (London, and Great Western Potteries, Devon) send us their large illustrated catalogue of sanitary and built-coloured vitrified bricks and ornamental work in terra-cotta. The catalogue includes a number of traps and drain-pipes, air-bricks in salt-glazed stoneware, and bonding bricks for hollow walls in brown glazed stoneware, made with a dip to catch moisture (these are better in every respect than bent iron ties); stoneware conduit bricks for electric cables; moulded bricks in buff terra-cotta (a great variety of sections), and various ornamental paterae, terminals, balustrades &c.; also paving bricks and channels.—Mr. John Jones (Chelsea) sends us his new catalogue of sanitary appliances, including his well-known manhole covers of various forms, drain and junction pipes, gullies and gully gratings, patent flushing tank, stepirons for inspection chambers, his two forms of pipe stoppers (the bag and expanding screw stopper, both most efficient), drain-testing appliances and drain-clearing machinery, also cast iron and copper baths and lavatory fittings; washdown pedestal closet, and valve closet with stop top combined, made in one piece of white ware; various forms of flushing cistern; and a patent screw expanding connexion for the inlet arm of a closet basin, in which, by screwing a back nut against a loose collar, the moulded rubber ring is expanded, and a secure joint ensured, which can be tightened up by screwing the nut whenever required. Mr. Jones's appliances are all designed on scientific principles, so as to secure efficient action by simple methods.—The Lambeth Brass and Iron Company send a description and illustration (annexed) of their new automatic boiler feed, which consists of their gun-metal feed valve, mounted on a strong cast iron tank with manhole to facilitate cleaning. It is adapted to supply water automatically to steam cooking boilers where the pressure does not exceed 10 lb. per square inch.—Messrs. J. H. Sankey & Son send illustrations and description of their patent deep intercepting gully with perforated bucket. It does not differ in general principle from many other such gullies, but has an unusually deep seal which is not likely to run dry, and the water has all to pass through perforations in the sides of bucket, so as to ensure the interception of all solid matter.—Messrs. Crosby, Lockwood & Son send us their catalogue for 1898 of scientific and technical books, added to which is a new classified list of the "Weale's Series" of publications.—We have received an illustrated catalogue of electric lighting accessories from Messrs. Dobsons & Curtis Bros., Limited, of Dublin. The prices attached to the various



Lambeth Brass and Iron Co.'s Automatic Boiler Feed.

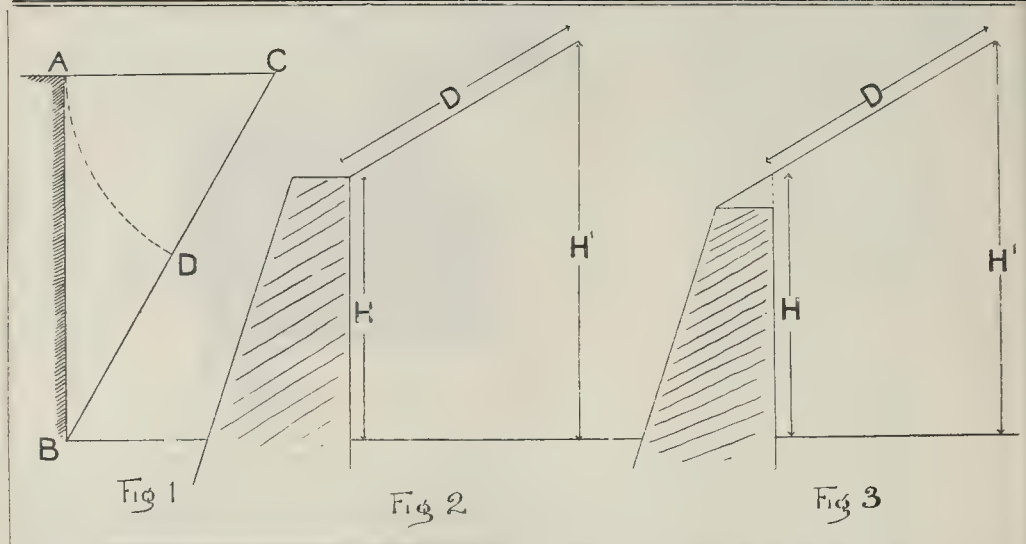
casings, lamps, cables, &c., described are very reasonable. It is fairly complete, and all the important electric lighting accessories are described. A carefully compiled index adds considerably to its value as a useful reference catalogue.—Messrs. Messenger & Co. (Loughborough and London) send us a sheet containing the results of tests for temperature made by the Superintendent of the Coventry Public Baths, showing the even temperature in the water in various parts of the swimming bath, which is warmed by Messrs. Messenger's apparatus. The statistics show a remarkable evenness of temperature at the surface and at the bottom of the bath, one of the columns of tests taken at various hours of the day showing absolute equality of temperature between surface and bottom water throughout the day; a very important point to attain in warming a swimming bath.—Messrs. Heal & Son send us a pamphlet on "Simplicity of Design in Furniture," written for them by Mr. Gleeson White, and illustrated with representations of articles of furniture made by them, which are drawn in a kind of imitation of old wood-engraving, white on a black cross-scored ground. The articles of furniture seem in themselves good examples of simplicity in design, but the method of drawing them is an archaic affectation in which we see no point.—Messrs. B. Finch & Co. send us a large and finely illustrated catalogue of sanitary fittings for hot water supply, plumbing, ventilation, heating, drainage, &c. These include excellent arrangements for lavatories and sinks specially designed for hospital requirements, various forms of closets, earth closets, urinals &c.; housemaids sinks, baths, including special spray baths for washing large numbers of children or adults, in public institutions. The only fault we find with the bath department is the decorations of the domestic baths, shown in chromolithograph, which are not good. The catalogue includes also flush tanks, plumber's work bath fittings, gullies, drain-pipes, specifications and plans of various public conveniences, and some useful schedules of weights and dimensions of pipes, cisterns, &c.—The Farnley Iron Company (Leeds) send us a beautifully got-up catalogue with coloured illustrations of their glazed bricks, a class of material capable of being put to excellent purpose in giving colour to town architecture, only they must be used with discretion; diagrams and sections of shaped and of moulded bricks; porcelain baths in the unadorned material, cream outside and white within, looking delightfully cool and clean; glazed sanitary ware for lavatories, sinks, and wash-tubs (the range wash-tubs on solid supports are admirable both in appearance and in practical character); closets of various types, channel bends, fire-bricks, &c. The make-up of the catalogue is exceptionally good, and renders it in fact quite an attractive volume to the eye.—Messrs. H. Sandell & Sons send us a catalogue showing a great variety of sections of mouldings and other woodwork as run at their mills.—Messrs. Stanley Bros. (Nuneaton) send a small catalogue of garden tiles, ornamental flower pots, vases &c.—The Photochrom Company send a catalogue of the views &c. which they have in coloured photography.—Mr. Geo. Wragge

(Manchester and London), in sending us his catalogue of wrought-iron metal casements, frames, and fittings, says that he has "tried to go a step beyond the ordinary trade catalogue" in producing it with some attempt at artistic form and style. He has succeeded thoroughly. The paper, type and binding are exceedingly effective; the explanatory notes on the plates of sectional details are thrown into a decorative form of lettering and arrangement, and many of them are illustrated by picturesque sketches of a portion of the building with one of the windows shown as fixed in position. The drawings are by Mr. Edgar Wood, architect, of Manchester. This style of getting up a catalogue is likely to have its practical value, as architects will be more interested in it and more likely to keep it. As to the contents of the book, they include complete constructional sections of a large number of metal casements and frames, and a number of designs for casement fittings, all of which are artistic in style, and it is stated that all parts of the fittings are so fitted to the casements that broken parts can be replaced without unglazing. The volume shows that a catalogue need be no less practical for being artistically got up and illustrated.—We have received from Messrs. Dobsons & Curtis Bros. (Dublin) the second edition of their illustrated catalogue of electric lighting supplies. The illustrations show that their fittings are thoroughly up to date, and the prices attached will doubtless attract many customers to their branches at Dublin and Birmingham.

BOOKS RECEIVED.

THE CHURCH OF ST. MARTIN, CANTERBURY.—By the Rev. C. F. Routledge, M.A., F.S.A. (Geo Bell & Sons.)
FIRE SERVICE IN FACTORIES, &c.—By Harold Sumner (British Fire Protection Committee).

SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.—The third annual congress of this union was opened on the 2nd inst., at Croydon, and continued the following day. The new President, Professor G. S. Boulger, F.R.S., F.G.S., in his inaugural address called attention to the position of natural history science in this country at the accession of her Majesty, and to the character of present day geology and biology. The meetings, on Friday, were devoted to the reading and discussion of papers, Professor Boulger presiding. At the morning meeting Mr. C. Dawson, F.G.S., F.S.A. (Uckfield), read a paper on "Ancient and Modern Dene Holes." This, he explained, was a name locally given to certain artificial caverns excavated in the chalk pits of Essex and Kent. The caverns all bore a general similitude of design, and though generally found in Essex and Kent occurred in many other counties too. There was no internal evidence which gave any clue as to their age, origin, or use. Mr. John Tait then read a paper on "Entomology as a Scientific Pursuit." Mr. C. Dawson, at the afternoon meeting, read another paper on "Natural Gas in Sussex," which, he said, burnt with a brilliant yellow light, and it was calculated that the pressure at the source could not be less than 135 lb. to the square inch. Mr. E. Lovett (Croydon) read a paper on "The Folk Lore of Amulets and Charms." During the day visits were paid to the ancient archiepiscopal palace and the almshouses of the Whitgift Foundation, and in the evening a reception was given in the Town Hall by the Mayor and Mayoress.



The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XXIII.

WE have already indicated that there is a considerable difference of opinion amongst mathematicians as to the nature and extent of the overturning force exerted by pressure of earth on a retaining wall. We therefore give some further methods of making calculations. For example, Hurst gives some formulae which are very frequently adopted.

Thus, if T is the mean or average thickness of the wall, H the height, w the weight of a cubic foot of the earth at back in pounds, and W the weight of the wall also in pounds, then for a wall with vertical faces both at front and at rear, and with the backing horizontal at top

$$T = 7H \tan \frac{\alpha}{2} \sqrt{\frac{w}{W}}$$

α being the angle which the natural slope of the earth makes with the vertical, as follows:—

	α	$\tan \frac{\alpha}{2}$
Vegetable earth or clay in its natural state, consolidated and dry	15°	.414
Loamy ditto	50°	.466
Gravel and sand, moist	52°	.488
Shingle or gravel without sand	54°	.510
Excavated earth, wet	56°	.532
Fine dry sand	58°	.554
London clay in its natural state, but saturated with water	65°	.637
Ditto recently excavated, and ditto	75°	.767
Water	90°	1.000

The requisite thickness of a retaining wall with vertical faces having been found by this formula, the reduced average thickness that will be sufficient if the wall is battered is given as follows:—

If $T = 1.00$ for a wall with vertical faces ;	
Then $T = .86$ for a wall with external batter of 1 in 12 ;	
" .80 for a wall with external batter of 1 in 8 ;	
" .74 for a wall with external batter of 1 in 6 ;	
" .72 for a wall with external batter of 1 in 5 ;	
" .85 for a wall with internal off-sets and vertical face, but with $\frac{1}{4}$ less material than the vertical wall.	

For surcharged retaining walls, Hurst's method is to substitute for H in the formula given above H' , which is found, as in fig. 2, by setting off the distance D equal to H along the slope of the bank. When the bank is of less height above the wall than the distance H

would give, the actual height of the bank is taken for the value of H' , which, although not strictly correct, is near enough for practice, and its error on the side of safety. When the earth slopes from the front edge of the wall, H and D should be measured as in fig. 3.

Professor Rankine gives the following formula:—

$$P = \frac{w H^2}{2} \cdot \frac{1 - \sin \phi}{1 + \sin \phi}$$

In the formula, ϕ is the angle of repose, w the weight of earth per unit of volume, and H is the height vertically of the earth; whilst P is the pressure of the earth which, according to Rankine, acts horizontally at a point one third of the height from the base. This formula holds good for a retaining wall with a vertical back, the earth being horizontal and level with the top of the wall.

For those students who are unfamiliar with trigonometry, the same result can be obtained graphically thus:—In fig. 1 let AB be the height vertically of the earth which is to be supported; draw an angle ABC equal to the angle of repose or natural slope and draw AC horizontally meeting BC , then on CB mark off CD equal to CA .

Then $P = \frac{1}{2} w BD^2$. If the earth, instead of being horizontal and level with the top of the wall, is inclined at an angle, thus making the wall surcharged, then whatever be the slope of the earth above the top of the wall, whether a natural slope or a lesser angle, the thrust can be found according to Rankine's theory by calculating for its amount the hypotenuse of a right-angled triangle, of which $\frac{1}{2} w BD^2$ is the base, the hypotenuse being parallel to the actual slope of the surcharged earth. The direction of the thrust is, according to Rankine, always parallel to the actual slope of the earth, and the point of application of the thrust one-third of the height of the wall from the base.

According to another theory, that of Dr. Scheffler, the thrust is always parallel to the natural slope of the earth in question, and its amount is represented by the hypotenuse of the right-angled triangle, whose base is the $\frac{1}{2} w BD^2$, the hypotenuse being parallel to the natural slope.

The consideration of the calculation for retaining-walls intended to resist the pressure of earth or water suggests that walls, especially when isolated, should be made sufficiently strong to resist overturning by wind pressure. In respect of this there are three things to be considered—the wind pressure and its action, tending to overturn the wall, the weight of the wall, and the adhesion of the mortar tending to keep the wall upright. We can, therefore, calculate the stability of the wall by equating the moments of the wind pressure, the weight of the wall, and adhesion of the mortar about the edge of the wall. The wind pressure may be taken as acting at the middle of the height of the wall and in a horizontal direction, the weight of the wall acts vertically downwards

through the centre of gravity, and the adhesion of the mortar may be taken as also acting vertically downwards through the centre of the base of the wall. The adhesive power of the mortar may be taken at .10 cwt. per square inch for brickwork in cement, and .06 cwt. per square inch for brickwork in good mortar.

Hurst gives a formula for calculating the effect of wind pressure on walls which is:

$$T = \sqrt{\frac{PH}{1 + H/W}}$$

Here f is the adhesive force per foot super attained by the mortar at the end of, say, six months, H is the height in feet above ground, P is pressure of wind in pounds per foot super, T is thickness in feet of a wall with vertical face and without buttresses, W is the weight of wall in pounds per cubic feet.

In ordinary cases the value of P may be taken at 40 lb. per square foot; in very exposed situations 50 lb. per square foot may be taken, and a greater pressure than this would very rarely be experienced. The value of f is 6,000 for brickwork in Portland cement and sand, one to one; 5,000 for the same materials, one to two; 4,000 for the same, one to three; 4,000 for brickwork in lias lime and sand, one to two; 3,600 for brickwork in gray chalk lime and sand, one to two; 3,000 for brickwork in ordinary lime and sand, one to two. The value of W is 112 lb. per cubic ft. for brickwork; 145 lb. per cubic foot for Portland and similar stones; 166 lb. per cubic foot for granite.

OBITUARY.

MR. S. STENT.—We hear that Mr. Sydney Stent, C.E., F.R.I.B.A., who, some few years ago, designed the plans for the building of St. George's Home in Cape Town, died at Cape Town on the 20th ult. Mr. Stent was in his 52nd year.

MR. WILLIAM HENRY HUGHES.—The funeral of the late Mr. William Henry Hughes, who died at the residence of his father, 4, Russell-street, Liverpool, took place on the 2nd inst. at the Necropolis. Deceased was a partner in the firm of Messrs. Robert Hughes & Son, building contractors, of Liverpool and Seacombe.

MR. C. WHITE.—The death is announced of Mr. Charles White, who was chief engineer of the Leeds and Liverpool Canal. He was born in Yorkshire seventy-one years ago, and in his early life he was connected as an engineer with some of the first railways built in this country by George Stephenson. Afterwards he acted as engineer on the estate of Lord Downe, and thirty years ago he received the appointment of chief engineer and estate manager to the Leeds and Liverpool Canal Company, which offices he held until last Christmas.—*Liverpool Post.*

THE OFFICE OF WORKS.—Consequent upon changes about to be carried out in Whitehall-place, in pursuance of the scheme for the erection of public offices upon the Carrington House site, Her Majesty's Office of Works removed last week to new quarters adjoining the Institution of Mechanical Engineers, at Storey's-gate.

GENERAL BUILDING NEWS.

CHURCH, BANGOR.—The foundation stones of amilton-road Church, Bangor, were laid recently. The new edifice has been designed with a view to future extension, and it is being erected in the form of a large room, with an interior of horse-shoe shape. The first block will accommodate about 400 on the ground floor, and about 300 in the galleries, and the future block, in the form of a second transept, will give accommodation for about 300, so that the church is designed to accommodate congregation of 1,000. The front entrance vestibule is in the form of a large room, with an interior of horse-shoe shape, and the interior woodwork of pitch pine, and the walls of the building of oak stone, with Scabro stone for dressings. A corner tower has been provided. The architect for the church is Mr. Wm. J. W. Roome, Belfast. The contract is in the hands of Mr. James Colville, Bangor, contractor, Bangor, and the clerk of works is Mr. B. B. B. B. B.

REOPENING OF SOUTH LEVERTON CHURCH, NEAR LEFORD.—The church at South Leverton, near Leford, was reopened on the 1st inst. after restoration. The roofs of the nave and aisles have been replaced. The south porch has also been removed and a new one built. A concrete floor has been laid down in the nave, and covered with wooden blocks, and a new heating apparatus has been provided. The architect was Mr. C. Schofield, of London. The oak choir stalls are the work of Messrs. Hawley & Sons, of Penistone. A carved oak altar and pews, designed by the architect, was executed by Messrs. Percy Bacon & Brothers, London.

RE-OPENING OF BURNHAM OVERY CHURCH, NORFOLK.—In consequence of a considerable amount of dilapidation, it was deemed necessary to close this church about eight months ago, and commence a work of renovation and restoration, which has been carried out by Mr. Norman, of Burnham Westgate, as contractor, and Mr. Herbert Green, of Norwich, as architect. The re-opening has just taken place.

ST. LUKE'S CHURCH, COBHAM, GREAT YARLOUTH.—The foundation stone has just been laid of its building. The new church will be in the Gothic style. The total length will be 82 ft. by 33½ ft. The height of the walls to eaves being 13 ft. The church will be built of red brick, half timbered, and will be surmounted by a bell-tower. A screen will divide the chancel from the nave, and choir stalls will be placed in the chancel. The architect is Mr. Sidney Rivers.

CHURCH, REDLANDS, BRISTOL.—The foundation stone was laid on the 3rd inst. in Salisbury-road, of a building which is to serve as a temporary church for the neighbourhood. Plans were prepared by Messrs. P. Munro & Sons for a stone-built hall, which will first be used as a church, and afterwards as a permanent church. St. Katherine's hall, will be used as a parish hall. The building will be 108 ft. long and 36 ft. wide, the roof rising to a height of 50 ft. The chancel and sanctuary at the east end are to be approached by a few steps. There will be a porch on the north-west side. The building will be Gothic in style, the open roof being of pitch pine and covered with Broseley tiles. The builder is Mr. Vowles.

PROPOSED NEW AISLE, ST. VINCENT'S CHURCH, SHEFFIELD.—It is proposed to erect a new aisle in connexion with St. Vincent's Roman Catholic church. Plans for the erection of the new aisle have been prepared by Mr. Charles Hadfield, and it is anticipated that the work will cost about 3,000.

CHURCH RESTORATION, SHERRYNOUR, NORFOLK.—The Prince and Princess of Wales and the Duke and Duchess of York have just paid a visit to this church, and inspected the work of restorations, which is now nearing its completion. The architect under whose direction the work has been carried out (Sir Arthur Blomfield and Mr. Herbert Green) met the Royal party.

RESTORATION OF WITNESSHAM CHURCH, KENT.—The north aisle of this church has just been restored, as a commemoration of the Queen's fiftieth anniversary. New windows have been constructed and a stained-glass window erected. A new porch has also been added. The work has been carried out by Mr. Alfred Comport, of Northiam, who carried out the restoration in 1897, under the direction of the architect, Mr. E. H. Parkes.

NEW CHURCH FOR NEWPORT, MON.—A church is being erected in the Crindan district, Newport, by Mr. E. C. Jordan, from plans prepared by Messrs. Graham, Hitchcock, & Co., architects. The edifice is in the Early English style, and consists of nave and two aisles, chancel, organ chamber, and vestry, with a tower over the west door, sur-

mounted by four pinnacles. The vestries are placed underneath the north aisle. The church will be fitted with pulpit, reredos, and lectern in oak; the choir stalls, seating, and open timbered roof will be of pitch pine, stained and varnished. Wood-block flooring will be used, except for the sacristy, which will have tessellated tiles. The basement rooms are approached by side doors on the north side, with flights of broad steps. The church is designed to accommodate 600 worshippers. The estimated cost is about 8,000.

NEW CHURCH, MORECAMBE.—A new church (St. Barnabas) is being erected at the West End, Morecambe, under the supervision of Messrs. Austin & Paley, architects, Lancaster. The work is being carried out by Mr. J. Edmondson.

PRIMITIVE METHODIST CHURCH, NEWCASTLE.—On the 30th ult., foundation stones in connexion with the Primitive Methodist New Central Church, in Northumberland-road, Newcastle, were laid. The new building is estimated to cost about 12,000. The church will front Northumberland-road, and is planned to seat about 800 worshippers—for the most part on the ground floor—with a wide, horse-shoe shaped gallery round three sides of the church. Behind the rostrum is the choir gallery and organ chamber. The school buildings and vestries will be connected with the church at the rear, and will have a frontage to Ridley-place; there will be lecture hall, gallery, schoolroom, church parlour, library, minister's vestry, and class-room, together with a caretaker's house. It is intended to light the whole of the buildings by electricity. The church will be built of stone, with Westmorland green slate roof. The windows will be glazed with cathedral glass in leaded squares. The metal fittings will be mostly of varnished pitch pine. The architects are Messrs. Davidson & Bendle, and the contractor Mr. A. Bruce.

METHODIST CHURCH, BALLYNAFEIGH, BELFAST.—The foundation and memorial stones of a new church for the Methodist congregation at Ballynafeigh were laid recently. The architect is Mr. A. A. Forman (Messrs. Forman & Aston), of Belfast, and Messrs. Young & Dickson are the contractors.

WESLEYAN CHURCH, WALKLEY, SHEFFIELD.—Designs have been obtained and approved for this church, to seat 500 adults, with schools and classrooms underneath. The architect is Mr. Joseph Smith. The entire cost of the scheme will be about 5,000.

CONGREGATIONAL CHURCH, PEEL CAUSEWAY.—The foundation stone has just been laid in Ashley-road, Peel Causeway, of a new Congregational church. The estimated cost of the building is 2,700. Messrs. Waddington & Son are the architects.

WESLEYAN CHURCH, HALTON EAST, YORKSHIRE.—A new Wesleyan Church has been erected at Halton East. Messrs. Mawson & Hudson, of Bradford, were the architects. The roof is covered with Welsh slates, and surmounted by a Boyle's ventilator. The work has been carried out by the following firms:—Mason, Mr. Thomas Pickles, Skipton; joiner, Messrs. Emmott Bros., Addingham; slater, Messrs. Thornton, Skipton; plumber, Mr. D. Baldwin, Skipton; plasterer, Mr. T. Bailey, Skipton.

BAPTIST CHURCH, OVERSEAL, LEICESTERSHIRE.—On Whit-Monday the Baptists at Overseal opened their new church. The building is in the Gothic style, and capable of seating about 350 persons. There is also a school-room behind the church, capable of accommodating about 200 scholars. Lean-to class-rooms are erected on each side of the school-room, four on one side, together with preacher's vestry, and larger ones on the other. Mr. T. W. Yardley, of Swadlincote, was the architect.

PROPOSED NEW WESLEYAN CHAPEL AND SUNDAY SCHOOL, SOUTH KIRKBY, YORKSHIRE.—It is proposed to erect these buildings from designs by Mr. G. F. Pennington, of Castleford, at an estimated cost of 1,500, with seating accommodation for 300 persons.

CHURCH OF THE GOOD SHEPHERD, MURRAYFIELD, EDINBURGH.—A new church is to be erected at Murrayfield. The architect is Mr. R. S. Lorimer, of Edinburgh.

MISSION CHURCH, HACKENTHORPE, YORKSHIRE.—The foundation-stone of a district church at Hackenthorpe was laid on the 3rd inst. Mr. J. D. Webster, of Sheffield, is the architect, and Messrs. Kirkby & Drabble, of Mosborough, the contractors for the permanent church, now in course of erection. It was decided to build at first the nave only of the church at a cost of 14,500, and to proceed with the erection of the chancel as soon as the necessary funds, amounting to about 1,000, in addition, are forthcoming.

SCHOOLS, ALLERTON BYWATER, YORKSHIRE.—The New Board Schools at Allerton Bywater were opened on the 27th ult. The accommodation provided is for 240 infants and 200 boys and girls, but the buildings may be so extended as to accommodate 200 more children. Red bricks have been used, with stone dressings. The main elevation to the Fairburn-road comprises the mixed school, with a range of class-rooms behind. These latter are three in number, and will seat fifty scholars each; while fifty more may be taught in a fourth classroom formed out of the general school by one of Wilks' patent sliding partitions. The infants' school forms the elevation to the Town-street, and is at right angles

to the mixed department, by which it communicates through a corridor. In the principal room there is a gallery for sixty scholars, and sitting places at desks for seventy. There are also class-rooms. A babies' room has been provided. The entrances and exits are situated between the mixed and infants' departments. Here is situated a teachers' room in the form of an octagonal projection, whence the exterior of both schools may be had in full view. It will also be used as a Board-room. The building is heated by hot water on the low pressure system. The entire contract for the building was let to Mr. W. Green, of Kippax, for 3,370l. Mr. R. M. McDowall, of Castleford, was the architect.

SCHOOL, SWINTON, LANCAHIRE.—At Swinton, on the 28th ult., there was laid the corner stone of a new infants' school in connexion with All Saints' Schools, Moor Side. Mr. H. Lord is the architect.

ST. MARK'S SCHOOLS, LAKENHAM, NORFOLK.—The boys' school which has recently been opened in the parish of St. Mark's, Lakenham, was erected on the 26th ult. The building provides accommodation for about 130 children. There are two large rooms, two class-rooms, a teachers' room, and a cloak room, with the ordinary offices outside. The two large rooms are 70 ft. long by 22 ft. wide. The class room on the ground floor is 27 ft. long by 22 ft. wide, and there is a cloak room of the same size. On the cloak room there is a class room of the same dimensions. The two large rooms are divided by patent folding partitions. A room for the teachers is contained on the ground floor. The corridors are paved with red and black tiles. The plans were prepared by Mr. A. J. Lacey, architect, and the work generally has been done by Mr. J. S. Smith.

INFANTS' SCHOOLS, BOPEEP, ST. LEONARDS.—The opening of the new West St. Leonard's Infants' School took place recently. The site on which the building stands is situated in the Bexhill-road. About two years ago the school building at the east end, erected as a boys' department, but used at present as a mixed school, was opened. The new infants' school is at the west end of the site, leaving a space between the two for a future girls' school, which, when built, will complete the group. The new building is of red brick, with Bath stone dressings. The entrance lobby is floored with tiles, and opening out of this on the left side is the cloak-room, 22 ft. by 13 ft. 6 in. Adjoining this is a room for the teachers, and for the meeting of managers. The heating chamber adjoins this. On the right of the entrance is the babies' room. At the end of the entrance lobby is the principal schoolroom, 44 ft. by 24 ft., with gallery at each end. Opening out of this are two classrooms, each 23 ft. by 22 ft., every room has an open fireplace. The whole building is heated with radiators and a Daisy boiler, the manufacture of Messrs. Hayward Bros. & Eckstein, of London. The floors are of fire-proof construction, in steel joists and concrete. Upon this is laid, by J. F. Ebner, of London, a wood block floor of pitch-pine in bitumen. The architects are Messrs. Elworthy & Son, of St. Leonard's, and the builders Messrs. Eldridge & Crutenden, of the same place.

SCHOOL OF ART, GLASGOW.—The memorial stone of the new School of Art, situated in Renfrew-street, was laid on the 25th ult. At present only a portion of the scheme as contemplated is being carried out. The building now in course of construction comprises three floors. The basement flat is devoted principally to the applied arts and modelling, technical studies, and architecture. On the ground floor are the ornament and design sections, while on the floor above are the life and painting classes. There are also private studios for the staff, as well as lecture-room accommodation, and some of the apartments are so arranged that by opening folding doors they can be converted into one large chamber when required. Along the whole length of the building extends a corridor, which will be utilised for the exhibition of the works of the students and a hall on the upper floor will be used for the same purpose. The building has been designed by Mr. John Keppie, of Messrs. Honeyman & Keppie.

JOINT ISOLATION HOSPITAL, BOROUGH OF RICHMOND (SURREY) AND HESTON AND ISLEWORTH URBAN DISTRICT COUNCIL.—The architect of this building, which is situated at Mogden, has made provision for forty-six beds, of which twenty-two are in the large fever ward, twelve in the small fever ward, four in an isolation ward, and eight in a convalescent ward. The entrance gates and lodges are placed at the end of the Occupation-road, by which the site is approached, and the entrance leads centrally to the administrative buildings. On the right, at the north-east angle of the site, and near the entrance, is the convalescent home and discharging rooms, whilst deeper in the site towards the north is situated the small fever pavilion. The large fever pavilion is to the left of the administrative buildings, and midway between this and the small fever pavilion is the probationary block. These three pavilions have been planned so that they can be easily connected with the administrative block by means of covered ways, and wide roads for the ambulances lead from the gates to these buildings. At the extreme left of the site and placed the mortuary and post-mortem building, and to the right of this are the stables, laundry, disinfecting building, and ambulance shed. Each pavilion is placed on a raised platform or terrace, and 1 ft. above this is

the general ground floor level of each ward. This will give a slight slope all round the pavilion, and by this means security from damp is obtained. Ample provision is made for future extension. All the wards are under direct supervision from the nurses' day-rooms, and the provision for heating and ventilation are of the most approved kind, as also are the arrangements for disinfecting clothing and bedding, and the steam laundry, mortuary, &c. In the fever pavilions, besides general wards, provision has been made in separation wards, either for paying patients or for acute cases where separation from the noise of the general ward is necessary. The contractors were Messrs. G. Godson & Sons, Kilburn. The design is by Mr. W. I. Ancell, architect, London, under whose direction the work has been carried out. The sub-contractors are as follows:—Engineering, Mr. J. Jeffreys, Westminster; Locks, &c., Messrs. Charles Smith, Sons, & Co., Limited, Birmingham; gasfittings, Messrs. Strode & Co.; plumbing, Messrs. B. Finch & Co., Lambeth; laundry fittings, Messrs. W. Summercales & Sons, Limited, Kingleigh; furniture, Messrs. White, Allom, & Co.

THEATRE ROYAL RECONSTRUCTION, SHEFFIELD.—Mr. Frank Matcham is the architect for the proposed reconstruction of the Theatre Royal, Sheffield.

PROPOSED THEATRE, FARNWORTH.—A special session of the county magistrates was held recently at the County Police-Court, Haugh, to consider an application for the granting of a theatrical licence for a theatre to be erected in Farnworth. The architects are Messrs. Bradshaw & Gass.

THEATRE, SUNDERLAND.—Plans have been laid before the authorities for the erection of a bijou variety theatre, to seat about 1,500 persons, at the top of Roker-avenue, opposite to the new "Wheat Sheaf Hotel." Mr. G. H. Howell, of Sunderland, is the architect.

HOTEL, NEWCASTLE.—The Clarendon Temperance Hotel, Newcastle, which has just been erected, consists of six floors, and has frontages to Clayton-street, Bewick-street, and Pink-lane respectively. The basement is chiefly occupied by the kitchens and other offices, as well as by stock rooms. The hotel proper is approached from Clayton-street. Immediately on the left of the entrance doorway is the entrance for heavy luggage. At the top of the short flight of stairs, which leads to what is really the ground floor, is an office, and adjoining it is an apartment to be used as the commercial-room. Leading out of this is a writing-room. On the opposite side of the corridor from the commercial-room are the service-room and the still-room, while a short staircase hard by leads to the mezzanine floor, on which are six bed-rooms. Opposite the entrance on the ground floor is the elevator. On the right of the entrance is the smoke-room, and adjoining is a room for use as a board-room, room for auction sales, wedding breakfasts, or such-like events. Lavatory accommodation adjoins, and next comes the billiard-room. The staircase leading to the floors above is lighted by stained glass windows. All the rooms and corridors throughout the building are lighted by electricity, the fitting up of the electrical appliances having been done by Messrs. Ernest Scott & Mountain, of Newcastle. The building is heated by hot-water radiators, for which, as for the steam boiler and other apparatus, Messrs. MacKenzie & Moncar, Limited, of Edinburgh, have been responsible. The hotel has been built by the contractors, Messrs. J. & W. Lowery, of Newcastle, from plans by the architects, Messrs. Oliver & Lesson. Mr. R. Robinson has been clerk of the works.

PROPOSED NEW HOTEL, WEST HARTLEPOOL.—A site has been acquired in Cambridge-road, West Hartlepool, on which it is proposed to build a family and commercial hotel. Plans have been prepared by Mr. Garry, architect. The new building will contain a banquet hall, in which 120 people could dine. There are also coffee, commercial, and billiard rooms, and about seventy bedrooms. The elevations will be of red and buff bricks, with terra-cotta dressings.

HOTEL, YARMOUTH.—A new hotel, facing the Regent and Apsley Roads, Yarmouth, was opened recently for the accommodation of visitors. The building is in the Renaissance style. The structure consists of a basement, ground floor, and first, second, and third floors. On the ground floor, facing the Regent-road, is a restaurant. The remainder of the building is set apart as an hotel. Mr. J. F. W. Bray, acting under Mr. A. S. Hewitt (architect), was the builder.

MONASTERY, CLONARD, IRELAND.—A contract for the building of a new Monastery of the Most Holy Redeemer, Clonard, has just been signed. Mr. J. J. McDonnell, J.P., is the architect, and Messrs. W. J. Campbell & Son, Belfast, have been declared the contractors at 10,500l.

MASSONIC HALL, NEWBRIDGE, IRELAND.—A new Masonic Hall, erected in George's-street, Newbridge, for the accommodation of the United Service Lodge 215, was opened on the 27th ult. The building is of red brick with white stone facings, and includes

caretakers' apartments, lodge, and committee rooms with ante-rooms and a banqueting-hall, and was erected by Mr. John Cromer, contractor, of Lucan, from designs of Mr. W. Ramsay, C.E., Dunlavin.

CLERGY HOUSE, EASTON, BRISTOL.—The corner stone of the new Clergy House of All Saints with All Hollows, Elmgrove-road, Easton, was laid recently. The building, which is to cost 2,500l., is being constructed by Mr. E. Walters, in accordance with a design by Messrs. Crisp and Oatley.

PROPOSED TOWN HALL, OAKHAM, NEAR LINCOLN.—It is proposed to erect a town hall at Oakham, in commemoration of the Diamond Jubilee. The architect will be Mr. Edmund Jeeves, of Melton Mowbray, who has been instructed to prepare revised plans, the cost of the building being estimated at about 3,000l.

POST OFFICE, GLANTON, NORTHUMBERLAND.—On Whit-Monday a new block of buildings, recently erected in Glanton, was formally occupied as a post-office. The premises are from designs by Mr. George Reavell, jun., architect, Alnwick. They are situated in the centre of the village, at the junction of Whittingham-road with the High-street. Separate rooms have been provided for telegraph and money order business, and for the postmen and letter-sorting. The contractors for the various classes of work were:—Masons, Messrs. Muckle, Rothbury; joiners, Messrs. Dodds, Powburn; slating and plastering, Mr. T. Miller, Glanton; plumbing, Messrs. W. Dryden & Sons, Glanton; and painting, Mr. G. Robson, Wooler.

NEW WORKHOUSE INFIRMARY, LEEK, STAFFORDSHIRE.—This building has just been opened by the Chairman of the Board of Guardians. The architect of the Infirmary was Mr. J. T. Brealey. The building will accommodate sixty beds, and the cost has been 6,000l.

PREMISES, BROAD-STREET, BIRMINGHAM.—The plot of land in Broad-street, adjoining what is known as Broad-street Corner, has recently been let on a building lease by the Birmingham Canal Company, and building operations have already commenced. The site will be occupied by a block of shops and professional offices, from the designs of Messrs. Essex, Nicol, & Goodman, architects.

BOROUGH LUNATIC ASYLUM, CROYDON.—An inquiry has just been held by Major-General Crozier on behalf of the Local Government Board at the Town Hall, Croydon, in respect to the application of the Croydon County Council for power to borrow 124,582l. for the new Borough Lunatic Asylum. The Town Clerk said sanction was obtained in 1895, and the Council had been occupied since then in arranging the plans for the building. A committee was appointed, and a large number of plans were sent in, the premium being awarded to Messrs. Crisp, Oatley, & Skinner, of Bristol, whose plans were adopted. The plans were submitted in the ordinary course to the Lunacy Commissioners, and, subject to certain alterations, were approved of by them, and by the Secretary of State. The Council was very anxious to begin building this summer, and proposed to let a separate contract for the foundations, so as to save time. Mr. Crisp, of Messrs. Crisp, Oatley, & Skinner, said that 600 patients would be provided for ultimately, but for the present it was proposed to provide accommodation for 432. There would also be provision for the accommodation of about sixty attendants, which did not include the accommodation for the medical staff. Mr. Crisp then went through the plans with the inspector, and explained them in detail.

CHURCH INSTITUTE, SEAFORD, SUSSEX.—The Simmons Church Institute, Seaford, has just been opened. It is situated in Crouch-street, and has been erected from plans by Mr. H. Curtis Card, of Lewes. On one side of the front of the building is a lobby, which leads into a hall, capable of seating 150 persons. The roof is an open timber one. At the rear of the hall, and approached by a door on either side, are rooms. Mr. C. Morling, of Seaford, is the builder.

NEW MUNICIPAL BUILDINGS, LLANDUDNO.—On the 3rd inst. Mr. J. T. Marsh, R.E., of the Local Government Board, held an inquiry at Llandudno with regard to the application of the Llandudno Urban District Council for a loan of 16,000l., the estimated cost of erecting new municipal buildings on land in Lloyd-street, given to the town by Lord Mostyn. The Clerk (Mr. A. Conolly) stated that the scheme had been under consideration four years, and that the plans of Mr. Silcock, Bath, were accepted as a result of a competition. He read a letter from Lord Mostyn giving the land in commemoration of the Queen's jubilee reign. Lord Mostyn's agent had written in terms of disapproval of the plans of the new buildings, as not being of a sufficiently imposing appearance, and stating that the architect had evidently been limited in the matter of funds.

EXTENSION OF CITY HOSPITAL, ABERDEEN.—Three new wings are to be built, according to designs by Mr. John Rust, City Architect, at a cost of 4,650l.

NEW CO-OPERATIVE HEADQUARTERS, LEEK.—The committee have accepted the tender of Mr. Thomas Grace, of Leek, for the new offices, stores, bakeries, shops, assembly and board rooms, &c., designed by Messrs. Wm. Sugden & Son. When fitted up and furnished it is estimated that the cost will be about 3,500l. Mr. Johnston, C.E., of Maccles-

field, will construct the ovens on his improved method. "Fair wages" clauses are incorporated by the architects in all these contracts. Recently the Society erected the first section (costing 1,000l.) of a new branch in Pritch-street from the same architects' plans.

WORKMEN'S DWELLINGS, INVERNESS.—The block of workmen's dwellings to be erected in Ross-street, Inverness, will be proceeded with immediately. The buildings, which will cost about 5,000l., will accommodate twenty-seven tenants. Mr. William Macintosh is the architect.

BATHS, BRADFORD-ON-AVON.—New baths have been erected at Bradford-on-Avon, as a memorial of the Queen's Diamond Jubilee. The cost of the baths is about 1,400l., and the style of the buildings is Gothic, Mr. S. Howard (Town Surveyor) being the architect.

VICARAGE HOUSE, CROOKES, YORKSHIRE.—A new Vicarage house has just been erected in Crookes Parish, from plans prepared by Mr. J. D. Webster, Diocesan Architect, and the contract for the building was given to Mr. Aaron Moore.

NORTH WING OF TEMPERANCE HOUSE, KEW.—The contract, says the *Kew Bulletin*, for the erection of this building, which will complete the whole structure in accordance with the original design of Decimus Burton in 1860, was entrusted by the First Commissioner of Her Majesty's Works and Public Buildings to Messrs. Mackenzie & Moncar, of Edinburgh.

CHAPEL, QUEEN ANNE'S SCHOOL, CAVERHAM, READING.—The foundation stone has just been laid of a chapel at this school. The architect is Sir A. Blomfield, and the contractors are Messrs. G. Lewis Bros., Reading. About 200 seats will be provided in the chapel.

DISPENSARY, GLASGOW.—On the 25th ult., the Agnes Barr Dispensary in connexion with the Glasgow Samaritan Hospital for Women, Victoria-road, was opened. The dispensary is built to harmonise with the existing hospital. It contains a waiting-room, a room fitted up for dispensing purposes, two rooms for examination purposes, and the usual conveniences. There is incorporated in the dispensary wing a small house for the caretaker. The architects were Messrs. Macwhannell & Rogerson, Glasgow.

SANITARY AND ENGINEERING NEWS.

PROPOSED WATERWORKS, HOPE, DERBYSHIRE.—The Parish Council of Hope have had referred for their consideration a report which has been prepared by Messrs. Sterling & Swann, civil engineers, of Chapel-en-le-Frith, for the supply of the village of Hope with water from Crookstone.

PUBLIC WORKS, LEICESTER.—On the 2nd inst. Colonel A. J. Hepper, R.E., one of the Local Government Board Inspectors, held a public inquiry at the Town Hall in reference to applications by the Town Council for sanction to borrow various sums of money for public baths, sewerage, and street improvements. The Town Clerk (Mr. J. Bell) represented the Corporation, and there were also present the Borough Surveyor (Mr. E. G. Mawby) and others.

WATER SUPPLY, CASTLE EDEN COLLIERY.—The scheme of water supply submitted by the Eastington Rural District Council for Castle Eden Colliery, Durham, has been approved by the Local Government Board. The water is to be pumped up into a reservoir from the sea, and conveyed into a reservoir, and then from the latter a distance of three miles in a cast-iron main, when it will be distributed over the town. The scheme has been designed by Messrs. D. Balfour & Son, of London and Newcastle.

SEWAGE DISPOSAL AT EXETER.—The Local Government Board have intimated that they will assent to a loan of 40,000l. being raised by the Exeter City Council, for the purpose of carrying out the Cameron scheme for disposing of the sewage by the aid of the septic tank.

WATER SUPPLY, HAYDON BRIDGE.—The Hexham Rural District Council have engaged Mr. Harry W. Taylor, of Newcastle-on-Tyne, to prepare a scheme for the Water Supply of Haydon Bridge, Northumberland.

STAINED GLASS AND DECORATION.

WINDOW, ST. MARY'S CHURCH, CLYMPING, SUSSEX.—The end window of the north aisle in St. Mary's Church, Clymping, has just been filled with painted glass the subject being the Annunciation of the Virgin by St. Gabriel, with panels containing the dove, and lily branch and scroll. Under the window is a memorial brass plate on a marble slab. The work was carried out by Messrs. F. Holt & Co., Warwick.

WINDOW, PARISH CHURCH, UTTONETER.—A new stained-glass window has been placed in the north side of the parish church. It was supplied by Messrs. Ward & Hughes, of London.

WINDOWS AND PULPIT, ST. MARTIN'S CHURCH, BIRMINGHAM.—The Wilkinson memorial windows, St. Martin's Church, have just been unveiled, and at the same time the Miller pulpit was dedicated. The windows are three in number, and have been designed and executed by Messrs. John Hardman & Co., of Birmingham. The designs were prepared by Mr. Dunstan J. Howell. The Miller pulpit is erected in the north-west angle of the tower, and is approached

from the church by the stairs to the belfry. The tower has been pierced, and a solid oak door let into the wall, the pulpit is of the decorated style, in harmony with the tower, and is built of stone from the Grinshill Quarry, Shrewsbury. A canopy of stone, is placed over the pulpit. The work has been executed by Messrs. W. Sapote & Sons, from the designs of the architect of the church, Mr. J. A. Chapman.

WINDOW, CLAY CROSS PARISH CHURCH, DERBYSHIRE.—A memorial window has been placed in Clay Cross Parish Church. The cost of the window was about 200l. It was supplied by Messrs. Clayton & Bell, of London, and the stonework was carried out by Mr. E. Tinkler, builder, of Clay Cross.

MEMORIAL WINDOWS, OVER WYREDALE, LANCAASHIRE.—Two stained glass windows have been inserted in the south side of Abbeystead Church. The windows were supplied by Messrs. Whirley & Hunt, of Lancaster.

FOREIGN.

FRANCE.—Five painters, MM. Cormon, Dagnan-Bouveret, Francis Flamens, P. Humbert, and Aimé Morot, are candidates for the chair at the Académie des Beaux-Arts left vacant by the death of Gustave Moreau. The Medal of Honour for architecture at the Salon, we are not surprised to hear, has not been awarded this year, nor any premiere médaille, or secondes médailles have been awarded to MM. André, Jonny Bernard, and Sirot. The Paris Council not having been able to find any site on which to rebuild the Morgue, which is insufficient for present requirements, has undertaken alterations and extensions to the existing building. —M. Sanson has been appointed architect for the Palais de la Chaumière which is to be built in Rue Chartron, to replace the Charity Bazaar burned last year. The building will present a monumental façade with a figure in alto-relief symbolising Charity. The interior will comprise a central nave with a series of side galleries, and a large number of exits will be provided. —The furniture, pictures, and other objects from the studio of Munkacsy have been sold by auction. The sale realised 137,000 francs. —The jury in the competition opened by the Corporation of Aubervilliers for the construction of a Salle des Fêtes, a Palace de Justice, and a Public Library, have awarded the first premium to MM. Joanny Bernard & T. Robert; the second to MM. Maistre & Berger, and the third to M. Dubuisson. —One of the oldest and most curious buildings in Rouen is now under process of repair. It is a fifteenth century house at a corner of Rue du Bac, which attracted the special notice of Viollet-le-Duc, and is a complete type of the mediæval house with half-timber work, overhanging gable, and angle most. In the course of the work there have been discovered, under the later additions on the ground story, a series of wooden pendentives terminated by small grotesque figures. —A suspension bridge is being formed over the Rhine, between the commune of Chalons (Haute Savoie) and the railway station at Chirfont. —Important works have been commenced at Cherbourg for the enlargement and improvement of the port. —The death is announced of M. Jules Dumouza, architect, Paris, at the age of fifty.

AUSTRIA.—The old house of refreshment at Semmering, the "Erkerzoo Johann," has passed into new hands, and is being replaced by a new building under the direction of Messrs. Helmer & Fellner, architects, of Vienna; the new structure is to contain 100 bedrooms, a restaurant, coffee-room, and all necessary conveniences. The ground around the old house is being parcelled out for villas. —The inhabitants of Holeschowitz have submitted a petition to the Council of Prague that the city of Prague should receive the money which they had set apart for the maintenance of the church of St. Wenceslas in the Holeschowitz to the erection of a new church in Holeschowitz. Since the question of the demolition of this church has not yet been definitely settled, the Council has referred the petition to the Commission which has still to consult on the proposals of Monsignor Janig. Another petition has been laid before the same Commission, from the directors of the Ethnographic Museum, praying that the church of St. Wenceslas might be set apart for the reception of the collections. —Plans and estimates for the reconstruction of the waterworks at Schlan have been prepared by Herr Karl Kress, Civil Engineer, of Prague. The cost is expected to amount to 57,920 crowns.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. J. Ashbridge, late manager of the timber and coal department for Messrs. Burt, Boulton, & Haywood, has been appointed manager of the Haskin Wood Vulcanising Company. —Mr. Alfred J. Best, actioneer, surveyor, and valuer, 38, Sloane-street, has taken into partnership Mr. Herbert Adams, and the business will be carried on under the style of Messrs. Alfred Best & Adams. —Mr. H. Williams, estimator, Quantity Surveyor, has removed his office from 19, Craven-street, to 17, Buckingham-street, Delphi, W.C. —Messrs. Dobsons & Curtis, electrical engineers, of Dublin, have opened a branch office at 74, South Mall, Cork.

CONFERENCE OF BUILDERS' LABOURERS IN MANCHESTER.—The annual conference of the Federated Builders' Labourers' Unions of Great Britain and Ireland began in Manchester on the 30th ult. Seventy delegates were in attendance, representing 12,000 members of thirty-nine societies in as many cities and towns. Among the places from which they come are Manchester (Mr. James Bennett, president, and Mr. A. Kirkham, secretary of the branch), Salford, Birmingham, Huddersfield, Bradford, Bolton, Halifax, Leeds, Hull, Newcastle-on-Tyne, Preston, Nottingham, York, Coventry, Derby, Wolverhampton, and Worcester. Mr. J. Judge, of Leeds, presided over the conference, Mr. Bennett, of Manchester, being vice-chairman, and Mr. Peter Flanagan, of Hull, corresponding secretary, attended officially. The deliberations of the delegates were taken up with matters largely affecting local branches, but the agenda provided also for the discussion of such questions as old-age pensions, and how best to secure labour representation on public bodies. The Manchester and District Builders' Labourers' Society was established five years ago, and joined the Federation at once. Under its direction the Manchester labourers were to have struck work on April 1 to secure an advance to 6d. per hour as a minimum rate of payment, together with the promulgation of a code of working rules to be acknowledged by the employers. It was, however, decided just before that date that as the more powerful societies of the joiners and the stone-masons were about to make demands on the employers which might lead to a disturbance of the building trades, the labourers should postpone their action in the matter. As a result of the masons' strike some fourteen masons' labourers who are now out of work in Manchester are each receiving from the Labourers' Society 10s. a week, although we are assured that the society makes the allowance of its own free will, out of its satisfactory funds, and not by reason of any compulsion. The Manchester society does not include lod. carriers, who have a separate mutual combination of their own—Manchester Courier.

FALL OF A BUILDING IN MARYLEBONE.—Dr. Danford Thomas held an inquiry last Saturday respecting the death of George Unice, twenty-two, bricklayer, of Paddington-street, Marylebone. Mr. Robert Leggat, foreman to Messrs. H. Burman & Sons, the contractors, said his employers were rebuilding the Devonshire Arms tavern, and on Thursday Unice and another man named Daniel Mackie were working in the basement of the premises. The vaults of the tavern extended under a mansie beside the house. Unice and Mackie were putting a pier through the vaults, in the wall of one of which a crack was discovered. As soon as it was discovered some one shouted, "Look out; here it comes!" The arch of the vault and wall then fell in, burying Unice beneath a superincumbent mass of wreckage. The Coroner: "Do you think since these building operations have been in progress anything has occurred to lessen the strength of the arch? Witness replied that the foundations of sandy soil might have been affected by the heavy rain, and hence the collapse. The pier was being put in 10 ft. distant from where the crack showed. Shortly before this some heavy loads had been moved over the crown of the arch. The man was extricated as speedily as possible, but life was then quite extinct. Replying to Mr. Crabtree, Inspector of Factories, the witness said the bed of the old brick-work rested on nothing but sand. None of the shoring gave way. Mr. Mackie, the bricklayer, who was working with Unice, said there was no shoring in the vault, as there should have been. The Coroner: When did you arrive at that conclusion? Witness: When I saw the arch falling. Not before? Yes, when I went that morning. Witness added that he made no complaint to the foreman. The fall occurred within about five minutes of the crack becoming visible. The old bricks were soft and rotten. They were about one hundred years old. Mr. A. Ashbridge, District Surveyor, said he approved the plans for reconstructing the "Devonshire Arms," and considered the works were turned out satisfactorily. His belief was that when the hole was dug for underpinning the sandy foundation gave, probably owing to recent rain, and so weakened the side wall of the arch. Mackie was wrong as to the age and condition of the old brick-work; but for the rain witness did not think the accident would have occurred. Mr. Crabtree, on behalf of the Home Office, stated his conviction that the brickwork was good, but that owing to the heavy rains the sand foundation had eased down and caused the accident. The jury returned a verdict of death from an accidental cause.

ELECTRIC LIGHTING AT BLACKPOOL.—Mr. George W. Willocks, M.P., M.C.E., conducted a Local Government inquiry at the Town Hall, Blackpool, on the 31st ult., in connexion with an application made by the Corporation for sanction to borrow 500l. for the provision of a fire engine and fire escape, 880l. for the purchase of land for the extension of the gas works, and 40,000l. for the purposes of electric lighting. Mr. L. Loftus, Town Clerk, conducted the case for the Corporation, being supported by Mr. R. C. Quinn, chief electrical engineer.

CORK PAINTERS AND TENDERS.—The master painters of the city have decided, as the result

of many deliberations, to levy a charge on the amount of all tenders handed in and not accepted. Five per cent. will be charged on all tenders under 25l., and 2½ per cent. on all exceeding that amount. This course has been taken as a measure to prevent the practice now existing of parties seeking what the master painters regard as an unreasonable number of tenders—a proceeding involving them in considerable expense and trouble. The building trade of the city look upon the proposal as unworkable, but they have taken no combined action on the matter up to the present.—Cork Examiner.

METROPOLITAN ASYLUMS BOARD.—An ordinary meeting of the managers of the Metropolitan Asylum District was held at the County Hall, Spring-gardens, last Saturday, Sir Edwin Galsworthy, the Chairman of the Board, presiding. A long discussion took place upon a letter from the Local Government Board stating that the report of the Special Committee in the matter of the Brook Hospital expenditure did not contain specific replies to the several questions asked in their letter of October 22 last; that the committee did not employ a competent surveyor as suggested by them, and that ordered by the managers; and that they were still of opinion that the course suggested by them should be adopted.—Mr. F. Purchase characterised the construction of this hospital as a gross scandal. It had, he said, cost some 70,000l. over the architect's estimate, and about 38,000l. worth of the work was authorised by the architect without the consent of the Committee or of the Board. He moved, "That the Local Government Board be asked to institute an inquiry into the gross extravagance of the Brook Hospital Committee." In the result, it was decided to forward the report of the special committee, and a letter answering the several questions raised to the Local Government Board, with an intimation that if they were not satisfied with the same the managers would assist them in any further inquiry they might wish to make.

WALTHAM ABBEY.—Mr. J. Arthur Reeve writes that in his letter in our last issue he intended to say that Mr. Ferguson's suggestion about the rebuilding of the nave arcade was "ingenious," not "injurious," as printed. Mr. Reeve was out of town, and could not see a proof of his communication.

EGYPTIAN TOMBS.—At the Royal Institution on the 3rd inst., Professor Flinders Petrie delivered a lecture entitled "The Development of the Tomb in Egypt." In order to understand the tomb, he said, it was necessary to know the theory of the soul on which it was constructed. Four theories were held among the Egyptians. According to the bird theory the soul fluttered in and out of the tomb in the form of a human-headed bird; on the Osiris theory, the deceased went to the kingdom of Osiris; on the solar theory, he joined the souls in the boat of the Sun God; while the mummy theory required that the body must be preserved for ages until restored to the soul. The earliest tombs belonged, certainly, to a time when the mummy theory was not in force. The principal age of development was from about 4,000 B.C. to 3,500 B.C., after which date no new ideas were introduced. Professor Petrie proceeded to exhibit a long series of lantern slides illustrating the development of the above-mentioned portion of the tomb from a mere mound, with a niche out of which the soul might come, to an elaborate and complex structure with numerous chambers and courts. He pointed out how the form and plan were influenced, now by the desire of the family to have the statue representing the deceased in full view, now by their anxiety to have it preserved from any disfigurement that might grieve the soul, by having it entirely walled up, and explained how the sculptures and decorations were for the delectation of the soul. Next he described a series of tombs with sloping brickwork passages leading down to the chamber containing the coffin, and showed how, on account of certain engineering difficulties, the passage itself became a high vaulted chamber. The earliest pyramid started from such a type. Successive coats of masonry were added above the tomb, as to leave the outline stepped, and finally it occurred to the builders to put on an external smooth slope. All pyramids, however, were not built in this gradual way, later ones being started *de novo* and called out as single structures. In conclusion, the lecturer said that in later times—say, about 600 B.C.—the tomb was merely a well-shaft from a chamber opening off it at the bottom to contain the body, and that ultimately it became a simple shallow grave into which the body was put in the clothes worn in life.—Times.

PROFESSOR LEWES ON ACETYLENE GENERATORS.—On Monday last, a paper was read by Professor Vivian Lewes, before the Society of Chemical Industry upon "The Conditions Existing in Acetylene Generators." The author referred to the various forms of generator which have been seen for exhibition at the Imperial Institute. The opening day of this exhibition was to have been the 1st instant, but has unavoidably been postponed until the 15th inst.; the exhibition will probably remain open until the end of August. Some twenty to thirty different forms of generator will be exhibited, each having been tested as to safety by the Acetylene Committee before being allowed in the exhibition. Prof. Lewes stated that it was very important that

overheating should not occur in a generator, that in certain forms of generator he had known the temperature to rise above the melting point of tin, and above the decomposing point of acetylene itself. Indications of the reactions which had taken place in the generator at this high temperature were found in the waste lime and water, in which complex carbon compounds of a tarry nature appeared. Professor Lewes exhibited acetylene burning through several of the burners now on the market, and pointed out that, even with the Naphey injector burner, the trouble caused by the burner becoming choked with soot had not been entirely overcome. In the discussion which followed the reading of the paper, Professor Lewes remarked that he did not consider that it had yet been proved that the phosphuretted hydrogen and sulphuretted hydrogen found as impurities in commercial acetylene were evolved from calcium phosphide and calcium sulphide respectively, but that it was quite possible they had their origin in some other source. He quite agreed, however, as to the advisability of purifying the gas before use, and added that a remarkable amount of purification was in many cases carried on in the generator itself, owing to the gas having to bubble through the lime water formed during the decomposition of the calcium carbide.

NEW CLOCK, COLLEGIATE CHURCH OF ST. SAVIOUR'S, SOUTHWARK.—A new clock, which is now being placed in the tower of this church, is to be started on the 22nd inst. It is a presentation from Sir Frederick Wigan, Bart., and is being carried out and fixed under the superintendence of Mr. H. Hardwicke Langston, architect. The clock makers are Messrs. Gillett & Johnston, of Croydon.

THE RESTORATION OF ST. ALBAN'S CATHEDRAL.—Lord Aldenham having applied for a faculty for authority to complete the work of restoring the high altar screen at St. Alban's Cathedral, the Registrar of the Diocese held a Court at the Cathedral, on the 6th inst., for the purpose of hearing objections thereto. It is stated that as long ago as 1884 Lord Aldenham commenced restoring the screen, but when a portion of the work had been accomplished, Lord Grimthorpe raised objections to the carrying out of certain of the proposals, and, as he possessed a faculty which covered the whole building, his objections were upheld. Two faculties were subsequently granted to Lord Aldenham, but he did not complete the restoration, and he now petitions for a faculty empowering him to vary the original design. At the Registrar's Court no opposition to this alteration was made.

ELECTRIC LIGHTING AT BARNES.—The Board of Trade has issued a provisional order to the Urban District Council of Barnes, empowering them to supply electricity throughout the whole of the area within their jurisdiction, but excluding Hammersmith Bridge.

THE LONDON SMOKE NUISANCE.—At the meeting of the Chelsea Vestry on the 7th inst., Dr. Louis E. Parkes, Medical Officer of Health for the district, in his report, referred to the smoke nuisance along the Thames caused by smoke emitted from factory chimneys, and from the steamers passing up and down. He pointed out that, owing to the strike of the Welsh colliers, the amount of smokeless anthracite coal available for steam generating purposes in the Metropolis had of late been very limited. The hard steam coal procured from the North country mines, which was now largely used in London, gave off large volumes of smoke mainly by reason of the fact that the furnaces had been constructed with the view to the exclusive use of Welsh coal. He suggested that notices should be prepared stating that the Vestry was of opinion that it was necessary that all furnaces used for generating steam within the boundaries of the parish should be constructed in such a manner as to consume the smoke arising from any combustible that might be used, and that such notices should be forwarded to the various persons concerned, together with an intimation that in future a deficient supply of smokeless coal would not be accepted as an excuse for the infringement of the smoke provisions of the Public Health Act.

ST. GILES'S, CRIPPLEGATE.—At a special sitting of the London Consistory Court on the 6th inst., in the Wellington Chapel of St. Paul's Cathedral, Mr. H. Baylis made an application on behalf of the vicar (the Rev. A. Barth) and churchwardens of St. Giles's Church, Cripplegate, for a faculty giving power to carry out a large number of alterations at the church. It is proposed to remove the organ from the east end of the north aisle to the east end of the south aisle, and to restore it; to enlarge the church so as to provide more seating accommodation; and to construct a side chapel for the reception of church furniture and ornaments from St. Bartholomew's Church, the parish which it is proposed to unite with that of St. Giles's Cripplegate. A faculty was also prayed for giving power to remove any human remains found during the course of the alterations and to re-inter them in the churchyard formerly used and still available for that purpose. The total cost of the alterations would be 1,700l. The Chancellor decreed the faculty to issue as prayed for, and ordered further that any human remains discovered during the alterations should be removed to the crypt in the churchyard, subject to such sanitary regulations as should be decided upon by the medical officer for the district.

THE PROPOSED CHEAPSIDE IMPROVEMENT.—On the 6th inst., Dr. T. H. Tristram, Q.C., Chancellor of the Diocese of London, held a special sitting of the London Consistory Court, in the Wellington Chapel of St. Paul's Cathedral, for the purpose of deciding an application with regard to the projected Cheapside improvement and the opening of a disused burial-ground for the purpose of such improvement. The object of the application was to obtain the Chancellor's sanction to an agreement entered into with the rector, the Rev. Harry Jones, as freeholder of the small churchyard of St. Peter's, West-hamp, and the trustees of the City of London Parochial Charities. The Chancellor, in delivering judgment, decreed the faculty to issue as prayed for. The agreement entered into would be sanctioned in accordance with the terms of the petition.

THE LIBERATOR BUILDING SOCIETY.—Another of the estates of this Society has just been disposed of by Messrs. Douglas Young & Co. The final portion of the West Worthing Estate, comprising some forty-five plots of freehold building land and six freehold villas, was submitted to auction by Mr. Douglas Young, on the Estate, on Friday last week, when he disposed of the whole of the land and three of the residences for a sum total of 8,332l. Several persons, including well-known property buyers, travelled from London, and the general interest which had been aroused in Worthing itself attracted a large attendance at the sale.

SALE OF AN ESTATE, ROTHERFIELD, SUSSEX.—Messrs. E. & H. Lumley will sell, on the 28th inst., in one lot, at the Mart, Tokenhouse Yard, E.C., the Rotherfield Station Estate, which contains about sixty acres of land suitable for building purposes. The sale will be by the Instalment Mortgage system, i.e., the purchaser will have the option of paying the purchase-money by instalments spread over a term of thirty-five years.

CAPITAL AND LABOUR.

BRICKLAYERS' WAGES, LEICESTER.—On account of the briskness of trade, the Leicester Builders' Association have notified to the Bricklayers' Society an advance of 1/4d. per hour, making the rate of wages 1d. per hour. The concession is regarded as almost unique, as no demand for an increase had been put in.—*Leicester Post*.

STRIKE OF BURY STONEMASONS.—The three months' notice given by operative stonemasons in Bury expired on the 31st ult., and the men failed to resume work. The men have demanded an advance of 1d. per hour, and the alterations of existing rules affecting the limitation of apprentices and the ready-worked stone question. The men demand that the stone worked in one district shall not be utilised in buildings erected in another district, and that all stone shall be worked in the town or district where it is used. The masters are prepared to concede 1/4d. advance, but contend that the number of apprentices should not be fixed, as it was not to the interest to overrun any shop with lads, and that the men's worked-stone contention was protection pure and simple. Meetings of masters and men were held, but no terms could be arranged, and each side now awaits something turning up.—*Manchester Courier*.

BUILDING TRADE WAGES AT SUNDERLAND.—The builders' labourers in Sunderland and district have sent a notice to the National Amalgamated Union asking for an advance of 3d. per hour, so as to make the minimum rate of pay 7d. per hour. The application has been forwarded by the National Amalgamated Union of Labour.

THE MASONS' STRIKE IN MANCHESTER.—Very little change has taken place in the position of affairs between the stone masons of Manchester and their employers since May 15, when the men came out on strike. About 200 men belonging to the society are at work, we understand, on the terms demanded. These are divided over a fairly large number of jobs, where the masters have given way rather than bring operations to a standstill. Those who came out because of the refusal of their demands are still idle. Strike pay has been distributed to the members of the society at the rate of 12s. each man per week.—*Manchester Courier*.

THE STRIKE IN THE READING BUILDING TRADE.—The carpenters and joiners who are out on strike recently communicated to Mr. Catley, the Secretary for the Masters, that the conditions under which they were willing to return to work were 8d. per hour (already conceded by the masters), the cessation of work at 12 noon on Saturdays, and all their own set of "rules" to be granted within a month; or, failing the latter, that the Board of Trade be applied to, under the Conciliation Act of 1896, to appoint an arbitrator. The masters unanimously agreed on a reply in the following terms: That all the Reading employers accept the rise in wages of 3d. per hour; standard wages being now 8d. The employers do not object to ceasing work at 12 noon on Saturdays, if the trades agree upon this, and the employers are willing to accept it in the case of the carpenters and joiners as a temporary measure pending the final settlement of the rules, when, if the bricklayers take exception to this, it must be one of the rules to be submitted to arbitration. The employers are willing to accept the arbitration of the Board of Trade, should any matters in dispute do not seem to them to justify such a course; but

the time of settlement mentioned (one month) must in their judgement depend upon the receipt of the "rules" from the bricklayers within that time, as they cannot go to arbitration unless these rules are in their hands.

BUILDING STRIKE AT SWANSEA.—At a recent meeting of the Swansea Master Builders' Association it was resolved not to accede to the demands last made by the men, and the strike, therefore, continues. It was also decided to affiliate the Association with the Federation of Master Builders.

WAGES IN THE BUILDING TRADE, BANBURY.—The members of the Banbury branch of the Amalgamated Society of Carpenters and Joiners have addressed a letter to the master builders in Banbury and district asking for an advance of 1d. an hour, on the ground that wages at Leamington, Rugby, and other towns in the Midlands are 8d. an hour, while in Banbury they are only 6 1/4d. The men say it is twenty-one years since they had an advance of wages, and since then they have suffered a reduction of 1d. an hour. They ask that the increase may commence on July 1. The employers have agreed to have a conference with the men on the subject.

HALIFAX MASONS' WAGES.—The threatened strike of masons in the Halifax district has been averted. The men six months ago made a demand for an advance of 1d. per hour. An offer by the masters of 1/4d. per hour has been accepted by the men.

LEEDS PLUMBERS.—The threatened strike of plumbers at Leeds has been settled, the men agreeing to a 1/4d. an hour advance instead of a penny, as at first demanded.

LEGAL.

HEAVY DAMAGES AGAINST A BUILDER.

In the Queen's Bench Division, on the 7th inst., Mr. Justice Kennedy delivered judgment in the case of *Marshall v. Mackintosh*, an action brought by the plaintiff against a builder to recover damages for breach of a building agreement. The facts sufficiently appear from the judgment.

Mr. Justice Kennedy, in giving judgment, said that the only point he had to decide was the question of the damages the plaintiff was entitled to. By an agreement in writing, dated June 10, 1896, the defendant contracted with the plaintiff to pull down and remove certain buildings at 47 and 48, Dover-street, Piccadilly, and to build on the site a new structure, which was to be erected "in carcass" before December 25, 1896. Upon that being done the plaintiff contracted to grant to the defendant a lease of the land and buildings for a term of eighty years, from June 24, 1896, at a pecuniary rent for the first year and thereafter at a yearly rent of 1,100l. Clause 2 of the agreement provided that if the defendant made default under the agreement he should forfeit all benefit under the agreement, which should thereupon cease and be determined, and all the materials and buildings on the said premises should be forfeited to and become the absolute property of the lessor. Clause 11 reserved to the lessor, on the default of the defendant, a power to re-enter upon and take immediate possession of the premises and plant "without making to the lessee any allowance or compensation in respect thereof." The defendant got possession of the site on June 10, 1896, but except that he took down and removed 200l. worth of materials from the old buildings he did nothing whatever towards the fulfilment of his contract. The fact was that he had entered upon the undertaking without the means of fulfilling it. As there was no prospect of anything further being done, the plaintiff re-entered on January 10, 1897, as he had a right to do. It was clear that the mere fact of re-entry did not of itself exonerate the defendant from the liability to damages for breach of contract prior to re-entry, but it was contended for the defendant that the effect of clauses 2 and 11 did limit the plaintiff to such compensation as might be afforded to him by taking possession of the materials, plant, and buildings on the premises at the time of re-entry, without any allowance or compensation to the defendant, and that the plaintiff could not claim damages beyond that. His Lordship could not accept that view, for that would be to read with these clauses "as and for liquidated damage," or words to the same effect, and that he was not entitled to do. It was common enough to find the mention of such words when there was an intention of the parties so to limit the liability for a breach of the contract. In the absence of such express words, as in clauses 2 and 11, could not be construed so as to deprive the landowner of the right to prove actual damage from the defendant's failure to perform the contract; but the words in Clause 11 "without making any allowance or compensation in respect thereof" would not, in his Lordship's opinion, operate to prevent the builder from having included in the damages any value which might exist in the buildings, plant, &c., seized by the landlord when he re-entered. The damages must be assessed *rebus sic stantibus*, and it might be the case that if the structure was nearly completed "in carcass" at the time of the re-entry the landowner would fail to prove any substantial damage at all to flow from the breach on which he sued. If the defendant had performed this contract before the date of re-entry the old building would have been removed and a new and valuable structure

erected on the site, and if he had then failed to complete the plaintiff would have had no difficulty in getting some one to take up the undertaking on, at least, as profitable terms. But as it was the plaintiff had only been able to relet on terms involving a loss of £7,000. There would, therefore, be judgment for the plaintiff for this amount.

Mr. E. Morton appeared for the plaintiff; and Mr. G. A. Scott for the defendant.

MEETINGS.

FRIDAY, JUNE 10.

*Institution of Junior Engineers (Westminster Palace Hotel).—*Special meeting to welcome Sir T. Salter Pym, C.S.I., Honorary Member of the Institution. 8.30 p.m.

SATURDAY JUNE 11.

*Royal Institution.—*Dr. R. Caton on "The Temples and Ruins of Asclepias at Epidauron and Athens." 11.30 p.m.

*Dundee Institute of Architecture, Science, and Art.—*Excursion to Drummond Castle, Crieff, Muthill, &c.

SUNDAY, JUNE 13.

*Carpenter's Hall, London Wall (Fryer Lectures on Carpentry and Joinery).—*Professor T. Roger Smith on Timber and Half Timber Houses. Partitions. 7.30 p.m.

TUESDAY, JUNE 14.

*Society of Engineers.—*Visit to the Gas Light and Coke Co.'s Works, at Chelsea, S.W., and the Gigantic Wheel, at the Earl's Court Exhibition.

WEDNESDAY, JUNE 15.

*Builders' Foremen and Clerks of Works Institution.—*Ordinary meeting of the members. 8 p.m.

THURSDAY, JUNE 16.

*Institution of Electrical Engineers.—*Conversations at the Natural History Museum, South Kensington. 9 p.m.

*Society of Antiquaries.—*8.30 p.m.

FRIDAY, JUNE 18.

*Northern Architectural Association.—*Visit to Durham.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.
Open to opposition until July 12.

[1897] 1194.—SWITCH FOR CONTROLLING FROM A DISTANCE ELECTRIC MOTORS FOR WORKING HOISTS, PROJECTORS, CRANES, CAISTANS, &c.; *G. Martinie.*
The control is obtained by a reversing switch acting through two electro-magnets, the circuits of which, or of either, are under the operator's control, which can be effected by a flexible cord of three insulated wires of small section—one of them for the common return. Special features of the invention are that the operator on the switch (a) has nothing to do with the controlling apparatus, his only duty being to push or release one or two buttons of the board; (b) can operate for very short intervals of time, or effect sudden startings or stoppings, since the armature is short-circuited in an excited field.

14,599.—TREATING BLAST FURNACE SLAG FOR USE IN BRICK-MAKING; *A. D. Eiler.*
The process for treating sulphurous blast furnace slag in its ground state with a weak solution of nitric acid to render it super-ficially desulphurised, as well as impregnated with nitro-silicic acid, the solution contains about 14 per cent. of nitric acid, and the slag is ground dry so that at least 90 per cent. shall pass through a sieve of 180 meshes to the linear inch.

14,660.—A DIVIDING INSTRUMENT FOR CIRCLES; *C. E. Grendon.*
For a convenient, to divide a circle or semi-circle into equal parts, is devised a plate of brass or other metal, which is slotted and divided into a required number of equal parts, and by placing the same upon a circular arc or circle, the latter may be divided according to the graduations upon the slots.

15,486.—WINDOWS; *G. J. Clarke.*
For windows which either slide or swing are made two-part hinges, two or more for each sash, the hinge parts being secured in bushings embedded in the frame and sashes. In arranging the hinges for swinging the weight-rods on one side are detached, and their ends secured by a pin-like device adapted to fit a bushing in the edge of the sash and a similar lodgement in the frame.

15,556.—A TILE CUTTING-OFF AND PUNCHING TABLE; *J. Phillips.*
The table is fitted with an arrangement for cutting and punching tiles at one operation. When the lever to which the cutting wires are fixed is pulled over to cut the tiles the rocking shaft, which runs the whole length of the table, is set in motion by a cam and lifts the cross-bars to which the punches are fixed, and punches the tiles, which are prevented from rising by a check-bar. At the backward stroke of the lever the punches are withdrawn, and the finished tiles can then be taken off.

15,611.—STAINED GLASS WINDOWS; *G. H. E. & T. Cooke.*
To obviate the use of leading, &c., the panes are arranged between two sheets of glass. Whilst the two outside sheets and the device between them may be transparent, the front sheet may be transparent and the pattern sheet transparent or not, and the pattern may be made in any guide or cupboard; when suspended it will extend by its own weight.

15,621.—FLUES OF WASHING-COPERS, SET-POTS, &c.; *F. Farrier.*
Instead of covering the flues with flat bars, pieces of slate, &c., laid across one another, the brickwork in which the copper is built up is so constructed that the top of the copper, but one side shall be about 1/4 in. below the rim of the copper; then covers of, preferably, cast-iron are placed over the top of the flue, which have a quarter-circle cross-section, are curved to fit the copper or pot, and are made in different lengths, recessed for overlapping; the cover forms an arched top which connects the copper with the walls of the flue, and the space on the top is filled with brick, cement, or concrete.

15,622.—SAWS; *J. H. Akam.*
In order that the saw may cut whilst moving in either direction its teeth are formed in pairs, and a gullet is left between each pair; the teeth alternately point in a reversed direction with their cutting points towards the gullets, and the sides of the gullets more or less diverge towards the bottom to give a suitable rake to the teeth; the teeth of each pair are set in a direction opposite to that of the neighbouring pair.

15,636.—DISINFECTING DRAINS AND OTHER PLACES PROVIDED WITH A FLUSHING APPARATUS; *R. D. Bamker.*
Within an outer vessel is fitted a central inner vessel perforated at its lower part or with its lower part made of gauze, for containing the disinfectant; at the upper part of the outer vessel is an inlet pipe, whose one end enters the flushing pipe and other end enters the inner vessel, so that on an action of flushing some of the water running down the flushing pipe is caused to travel through the inlet pipe into the inner vessel, where the water impregnated with the disinfectant, and so through an outlet pipe into the flushing pipe again.

15,638.—SECURING REMOVABLE OBJECTS TO WALLS AND OTHER SURFACES; *F. M. Ruzene.*
For fixing or removing brackets, supports, balconies, shelves, and the like, is contrived a tubular plug which is permanently made fast within the wall and receives a removable stem piece fitted and held within it; the stem piece is carried on the projecting object to be fixed, and when the object is removed, an ornamental bolt is screwed into the plug.

17,000.—TOOLS, HANDLES, AND TOOLS FOR HANDLES; *J. W. Wood.*
The edge of the tool is opened up and sharpened and driven into the shoulder of the handle, the handle is made relatively thick, and the tapered shank or tang of the tool is formed with a series of transverse slots which extend between which is a transverse slot into which extends a tapering wedge key or rib dovetailed into the ferrule; tangs are dispensed with by the adoption of jaws for holding the grooved part of the tool.

[1898] 1769.—FIBRE-ROOF BUILDING STONES AND CEMENT; *P. Kleber.*
A plastic mass is made from an intimate mixture of finely pulverised burnt lime in a ratio of from 1—10 to 12 with quartzite or sandstone by the addition of diluted hydro-chloric acid, which is then pressed in moulds and subjected, in the presence of diluted hydro-chloric acid, to a pressure of up to seven atmospheres, corresponding to a temperature of 160 to 170 C. for hardening; the clinker produced may be ground for cement.

3,995.—WRENCHES OR SPANNERS; *E. Lieber.*
A head or fast jaw connects the two prongs of the fork on the upper side of the body of the wrench, a slot between the two shanks or prongs is carried through the body of the fork for guiding the leg of the movable (upper) jaw, a forked arm or lever reaches over the fork in the body of the wrench and is connected to it by a pin that serves as a fulcrum, a slot in the arm receiving a pin in the leg of the upper jaw.

6,741.—JOINTING METAL PIPES; *R. Ewing.*
A lined metal pipe, without socket, is joined to another of the same kind by turning the lead, or other lining, outwardly over the butt-ends, fusing or brazing the lead ends, and slipping a metal collar or thimble, lined or unlined, over the butt-ends.

8,401.—STANDS FOR THEODOLITES, LEVELS, TELESCOPES, &c.; *A. Hein.*
Around the hollow hemisphere which carries the instrument and the pendulum is placed a ring, to which is attached a movable and upper four pins that easily pass through holes in the ring's flange; helical or other springs tend to force the ring upwards and away from the hemisphere; on the base of the support is fulcrumed a lever adapted to come above the ring; a link connects the lever's front end with an eccentric or cam for moving the lever up and down; the link is slotted for its guide-pin; when the lever is slightly depressed its action on the ring, and so to the hemisphere, tends to steady the level, and when the cam is moved downwards the level is locked in position.

8,455.—WOOD PAVING AND BLOCKS FOR STREETS; *T. Grace.*
The paving consists of blocks formed and laid so that the upper surface will present regular series of tapered recesses (in *depression*) to receive a top dressing of asphalt or other coating, each block has one of its edges cut bevel-wise, and is laid in broken joint or bond, with the shorter height of the bevel abutting against the longer height of the next block.

NEW APPLICATIONS.

May 23—28.

11,513. C. P. Howell, Retaining Mechanism for Sliding Rods for Fanlights, &c. 11,565. H. Ely 11,781. E. Francetti-Schiaroni 11,910. J. Bartlett 11,970. British Pure Acetylene Gas Syndicate & T. Keene 12,061. Scarth & Ferro 12,173. R. Williams 12,232. V. Sardi 12,245. A. J. Motiulla, Acetylene Gas Generators. 12,572. R. Jones, Brazing Apparatus, Applicable to Portable Forges. 12,573. Glovers, Increasing the Initial Velocity of Bunsen Flames for Heating, Soldering, Brazing, &c. 12,574. Spences, Treatment of Sewage. 12,575. H. Kendall, Checking the Accuracy of Mechanical and Geometrical Drawings. 12,576. H. Tellow, Sizing Machines. 12,590. W. H. Hammond, Apparatus for Testing Drains, &c. 12,591. W. Camwood & Sons, and Another, Disinfecting Water-closets, Urinals, &c. 12,605. A. P. S. Jones, Rotary Motors. 12,610. Wood & Hoylands, Automatic Electrical Temperature Indicator. 12,618. W. T. Shepherd, Water-closets. 12,627. W. S. Smith, Electric Cables. 12,631. L. Parli, Filters. 12,639. E. Le Mar, Mechanism for Opening, Closing, and Securing Sliding Doors. 12,640. F. Heime, Accumulators or Secondary Batteries, and Apparatus for their Manufacture. 12,645. R. Kabakin, Apparatus for Rectifying and Concentrating Liquors. 12,646. W. J. Robinson, Door and other Bolts. 12,654. T. Burrows, a Wave Motor. 12,655. G. Leroy, Aerial Railways. 12,673. R. Killip, Lamps. 12,698. H. Hofer, and Another, Process of Producing a Printing Plate or Block, and for the Mathematically Correct and Identical Reproduction of Drawn or Printed Matter, without Redrawing, or the Intersecting Figures. 12,699. Graphical Negative. 12,701. Madison & Granham, Brush Heads and Handles. 12,706. Prest & Teale, Safety Devices for Hoists, Cages, &c. 12,713. Ruswutshs, Stone-swinging Machine. 12,714. Sir Charles Stewart Forbes, Bars, &c. 12,012. S. Falk & 12,061. Scarth & Ferro, Acetylene Lamps. 12,722. J. T. Falconer, Door Handles and their Spindles. 12,723. E. W. Hamilton, Making and Breaking of Electric Currents. 12,726. Eckardt & Zell, Jaw for the Face Plates or Chucks of Turning Lathes. 12,730. A. A. Smethurst, Concentric Ceiling Rose. 12,731. J. E. G. & Co., Limited, & G. E. Hey, Dia Globes for Electric, Incandescent, and other Lamps, and for Measuring Current or Voltage in Electric Lamps. 12,741. J. Carter, a Ladder Stay. 12,744. J. W. Denison, Fire-resisting Blinds, &c. 12,750. J. Willocks,

Methods of Applying and Using Disinfectants. 12,757. T. McEwan, Joining or Junction Boxes for Electric Wires. 12,770. Daw & Sanders, Road Scarifiers. 12,774. E. S. de Tamber, Carving or Impressing Designs, &c. 12,776. J. Eaplen, Frames for Winches, Cranes, and Similar Machinery. 12,783. W. A. P. Willard, Jun., Conductors for Electric Railways. 12,790. F. Berardi, Utilising the Pressure of Water in Pipes for Household Purposes. 12,800. C. H. Douglas, Saw Teeth. 12,814. Evetts & Schurz, and 12,809. W. Loelinger, Disinfecting Apparatus. 12,817. I. Timar, Heating Apparatus. 12,862. Beldam, Street and Road Gullies. 12,866. H. Sanders, Door-knobs, Spindles and Catches. 12,874. E. Caplat; 12,954. P. Dreake; and 12,022. J. K. Rigby, Acetylene. 12,880. A. Cleaver, Coils for Heating by Electricity. 12,885. A. S. Harrison, Automatic Indication and Prevention of Fire Risks. 12,916. P. J. Griffin, Nails, Spikes, &c. 12,919. H. Flesche, Sightsights and Windows. 12,922. A. A. C. Swinton, and 12,924. W. Peto, Electric Lamps. 12,929. A. J. Bull, Beam Compasses. 12,930. G. S. Hird, Sanitary Pipe Joint. 12,937. Taylor & Green, Water-closet and other Traps. 12,950. C. J. Lomas, Cement Concrete for Pavements. 12,007. Nesbit & Clowes, Water Heaters and Separators. 12,015. F. C. Jennings, Pipe Joints. 12,016. F. I. Sprague, Electrical-control Systems. 12,024. W. R. S. Jones, Flooring. 12,027. Schmidt & Kotheaus, Lifting Jacks. 12,034. Charlotte Smith, "Sand Washer." 12,038. T. Cardiff, Damp-resisting water-resisting Sanitary Water Composition or Paint. 12,041. C. A. Davison, Draughtsmen's Paper-weights. 12,042. C. Reising, Brick Drying-furnaces. 12,054. G. D. Innes, Metal Pedestals for Water-closets. 12,078. Peter Wood, Limited, & Nash, Continuous Kilns for Burning Bricks, Tiles, Sanitary Ware, &c. 12,091. Bridge & Trainer, Drawing Compasses. 12,100. Hodges & Lilbey, Floor Spring-hinges for Swing Doors. 12,117. C. Walton, Vices. 12,118. Rose, Conical Wedge for Fastening Tool-handles, rails, &c. 12,149. E. L. Pesse, Roofs and similar Structural Work. 12,153. Radford & Miles, a Plumb Rule. 12,159. G. A. Hirth, Adjustable Drawing Tables. 12,162. E. de Saint Hubert, Brick-presses. 12,179. R. G. L. Burn, Expandible Drain Plugs or Stoppers. 12,180. W. Bevit, Chimney-roofs or Cowl. 12,195. S. W. Bevit, a Single-chain Grab. 12,196. J. Hamblet, Sewer Blocks.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 24.—By J. C. PLATT (at Hammersmith).
Hammersmith—40, 42, 44, and 46, Wingate-rd.,
u.t. 45 yrs, g.t. 281, r. 1281. £1,700
13, Brackenbury-rd., u.t. 61 yrs, g.t. 34, 128, r. 395
By WILLIAM HOUGHTON (at Walthamstow).
Walthamstow—Blackhorse-rd., &c., 46 plots of land, f. 1,702
By D. SON & HILTON (at Blackheath).
Lee—2, 4, and 6, Boone's-rd., f. r. 621. 88. 830
By F. PITT & SON.
Newport, Isle of Wight—39, Upper-st., f. with goodwill 1,100
52, Upper-st., f. 295
1, Scarrot's-lane, f. 290
25 and 26, New-st., f. 290
Sea-st., freehold water-side premises 830
Carisbrooke, Isle of Wight—"Diamond Mead," f. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Sketch Models for Eight Stone Figures	Glasgow Corp. ....	.....	No date

CONTRACTS

Nature of Work or Materials.	By whom Required.	Forms of Tender, & Supplied by	Tenders to be delivered
*Wood Pavement	St. George Hanover-square Vestry	Surveyor, 1, Pimlico-road, S.W.	June 14
Schools, Acricington-road	Blackburn Sch. Bd.,	C. W. & Smith, Archt. 24, Richmond-terrace, Bickhurst	do.
Registry Office, Northallerton	North Riding C.C.	W. Stead, C.E. Northallerton	do.
Widening Leven County Bridge, near Yarm	do.	do.	do.
Sewerage Works	Southampton Corp.	W. R. G. Bennett, Esqr. Municipal Office	do.
Additions, &c. to Ivy Bush Inn	T. Jones	Morgan & Rifford, Archt. 3, Cannon-st. Aberdeen	do.
Additions to Electricity Works	Belford Corp.	T. Carter, Town Hall, Belford	do.
* Underground Conveyance	Willenden D.C.	O. C. Eubank, Offices, Dyne-roed, Kibblesworth	do.
* Wood Paving	do.	do.	do.
Painting at Infirmary	Whitechapel Union	B. J. Capell, 70, White-church-st. E.	do.
Stables, &c.	Herwood (Laure) Corp.	W. Whitnagh, Gasworks	do.
Alterations, &c. at Manse, Foveran	do.	Jenkins & Marr, O.E. 16, Bridge-st. Aberdeen	June 15
Workshops, &c. at Ravenworth-road, Maesfield	do.	W. Smith, King Edward-st. W. Maesfield	do.
Garra House, South Oram, Yorks.	do.	R. Barry, Archt. Arcade-chm. Chesham-st. W. Maesfield	do.
Sewers, Rye-side, &c. (Contract 156) ..	Rochdale Corp.	W. S. Platt, O.E. Town Hall	do.
Workshops, &c. at Ravenworth-road, Dunston, co. Durham	do.	Archibald & Co., Cragsley Hotel, Dunston	do.
Drainage over Lark Engine Drain	Burnt Fee District Commissioners	Archibald & Son, Market-st. Aberdeen	do.
Farmanous, near Londonderry	W. G. Lynch	W. M. Elwes, Archt. Commercial-derry	do.
Road Works, Brucklay, Cumblintown, N.B.	do.	J. C. Bennett, 314, Union-st. Aberdeen	do.
Additions, &c. at Doozie Arms Hotel, Highbridge, Somerset	Bergsman & Co.	J. R. Archd. Glasgow	do.
Workshops, &c. at Upper-street, &c.	do.	E. S. Scott, C.E. Town Hall	June 16
Auction Mart, Eilon, Aberdeenshire ..	Hallfar Corp.	Walker & Duncan, Archt. 3, Cornhill, N. Dublin	do.
Cottages, Arclietown, Kinlos, near Elgin, N.B.	do.	C. C. Doug. Archt. 147, High-st. Elgin	do.
Alighting House, Stables, &c.	Caraforth Co. Soc. Ltd.	C. F. Thompson, 4, The Arcade, Lancaster	do.
Ice Shops and Offices, New Bridge-street, Dewsbury	do.	W. H. Fox, Archt. Highgate, Dewsbury	do.
Two Weighbridges, St. John's-road Worcester	Slington Union	E. Davy, St. John's-road Worcester	do.
Police Station, Much Hadham	Herts C.C.	N. A. Smith, 381, Farringdon-st. S.W.	do.
C. Stage Works, Orchard-street	Newport, W. I. Sch. Bd.	F. Stratton, 31, Pyram-st. Newport	June 17
Alterations, &c. at Beacon House, near Addingham	do.	Milnes & Franco, Archt. Bradford	do.
* Excavating and Channelling	Stoke Newington Vestry	E. S. Church-street, Stoke Newington	do.
* Five Street Watering Vans	Newcastle - on Tyne Corp.	Engineer, Town Hall	do.
Building Works, Church-street	Lancaster Corp.	Borough Surveyor, Market Square	June 18
Road Works, Washbrook, Kings Lynn	do.	J. E. Fayers, Surveyor, St. Nicholas-street, King's Lynn	do.
House and Surgery, Queen's-road, Aberystwith	Dr. Bussell	G. Jones & Son, Archt. 12, Cornhill, Aberystwith	do.
* Wood Furniture	do.	W. H. Fox, Archt. Highgate, Dewsbury	do.
* Engine House	Leamington Corp.	W. H. Fox, Archt. Highgate, Dewsbury	do.
Stores, Stables, &c. at Lincoln-street, Trowbridge	J. Morton & Son	T. W. Whitley, Archt. 7, Jay-lane, Coventry	June 20
Two Houses, Plant Hill, Burnfield	T. Robson	J. Haycock, Archt. Robson, Burnfield, co. Durham	do.
Congregational Manse, Leek, Staffs.	Trustees	W. H. Fox, Archt. Highgate, Dewsbury	do.
Additions to White Rose Inn, Leeds ..	do.	T. Winn, Archt. 92 Albion-street Leeds	do.
* Wood Paving Blocks	Bernardsey Vestry	F. Sumner, Town Hall	do.
* New Walls adjoining Workhouse	Rimford Union	E. G. Boden, North Hall, Rimford	do.
* Sheds, Wall, &c.	Cly. Bor., of Croydon	Surveyor, 21 W. Ofen, Catford, S.E.	June 21
* Kerbing, Channelling, &c.	Leamham B. of W.	F. B. Cole, Clerk's Office, Bournemouth, N.E.	June 22
* Boundary Walls and Gates	Hackney Union	do.	do.
* Re-decorating and Repairing Relief ..	do.	do.	do.
* Granite	North Walsham U.D.C.	Surveyor, North Walsham	do.
Additions to House, Cabra	North Dublin Union	J. O'Neill, Board Room, New Brunswick, Dublin	do.

CONTRACTS—Continued.

[illegible]

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom advertised.	Salary.	Application to be in.
*Surrey and Dranghtman	London County Council	3/3s. per week	June 14
*Surrey, Collector, Inspector of			
St. James, &c.	Consett U.D.C.	150s. per annum	June 15
*Clerk of Works	Berkhamstead R.D.C.	150s. per week	do.
*Surrey, Inspector	Tottenham D.C.	150s. per week	do.
*Surrey, Assistant	Leicester Corp.	54s. 6s. per week	June 82
*Surrey, Inspector	do.	2/2s. per week	do.
*Building Inspector	Southend-on-Sea Corp.	104s. per annum	June 82

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, vii. & viii. Public Appointments, pp. xv. & xvii.

Wanstead.—5, Albert-ter., u.t. 82 yrs., g.r. 74 yrs., c. 381.		New Cross.—33, Erlanger-rd., u.t. 65 yrs., g.r. 81, r. 406.		Kilburn.—36 and 37, Salisbury-rd., u.t. 81 yrs., g.r. 136, 188, r. 82.	
Poplar.—5 to 6, Dalgleish-pl., f.	£350	15, Erlanger-rd., u.t. 68 yrs., g.r. 61, 68, r. 421.	£500	Stamford Hill.—657, Darent-hd., u.t. 86½ yrs., g.r. 101, c. 657.	£935
London Fields.—66, Devonshire-pl., area nearly 4,000 ft. c.	600	15, New Cross-rd., u.t. 25 yrs., g.r. 61, 15, f. 321.	320		715
By NEWBORN, EDWARDS, & SHEPHERD.		Old Kent-rd.—31 to 39 (odd), Peckham Pk.-rd., u.t. 15 yrs., g.r. 374, 108.	245	Henley-on-Thames, Oxon.—Vicarage-rd., " Rag- lans " and " Byrn Avon," g.r. 601.	050
Islington.—30, Almorah-rd., u.t. 54 yrs., g.r. 61, f. 321.	410	12, 8, Frensham-rd., u.t. 15 yrs., g.r. 374, 108.	300		
Holloway.—17, Kingsdown-rd., u.t. 60 yrs., g.r. 74, f. 321.	415	Walworth.—9, 10, and 11, Sutherland-sq., u.t. 10 yrs., g.r. 291, 128, r. 1361.	615	Lambeth.—7, 9, and 11, Lambeth-rd., r. 1661.	2,210
By NEWBORN, EDWARDS, & SHEPHERD.		Blanchard, Augustus.—Duke-st., c. 1, g.r. 2001, u.t. 11 yrs., g.r. 72.	960	By J. A. & W. THARR.	
Horsey.—High-st., f.g.r. 251, reversion in 60 yrs, u.t. 57½, g.r. 251.	750	Peckham.—43 and 45, Parkstone-rd., u.t. 66½ yrs., g.r. 431.	410	East Ham.—By J. A. & W. THARR, u.t. 221.	515
By NEWBORN, EDWARDS, & SHEPHERD.		Candover-rd., 31, Windsor-rd., u.t. 15 yrs., r. 101, r. 551.	450	Loughton.—Old-rd., " Sunnyside," u.t. 321.	515
Sidcup, Kent.—Blackhorse-rd., 1, g.r. 334, u.t. 15 yrs., g.r. 15.	605	Sydenham.—Kelvin Grove, a plot of building land, f. 321.	410	Hove, Sussex.—37 and 39, Waterloo-st., u.t. 42 yrs., g.r. 341.	550
Ball's Pond, Kent.—at Chislehurst, 1, g.r. 111, f. 111.	150	Kelvin Grove, a freehold bungalow residence, r. 261.	350	By HERRING, SON, & DAW (at Kilburn).	
Willesden Green.—Fishmonger's-lc., freehold stabling and shop, f. 321, 25.	150	Holloway.—1, Hercules-rd., with range of stabling, u.t. 54 yrs., g.r. 91, 98, r. 1491.	1,500	Kilburn.—2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 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987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.	
By STIMSON & SONS.		23, 15, and 17, Hercules-rd., u.t. 54 yrs., g.r. 141, 131, 121.	775	Fulham.—Holypot-rd., &c., 40 plots of building land, f. 321, 25.	3,805
Pentonville.—1, 3, Rodney-st., u.t. 46½ yrs., g.r. 401.	365	23, 15, and 17, Hercules-rd., u.t. 54 yrs., g.r. 141, 131, 121.	775	254, f. 321, 25	

MIDDLEBROUGH.—For the erection of a semi-detached villa residence, Linthorpe, for Mr. Marwood Smith. Mr. W. G. Roberts, architect, 6, Albert-street, Middlesbrough:—

J. Bulmer.....	£257 0	J. Burton.....	£297 0
Hudson Bros.....	257 0	J. Baker Bros.....	£120 0
E. Spencer, Middlesbrough.....	£116 0	J. Peck.....	£121 0
Curtis & Bowman.....	117 18	J. E. Robison.....	£35 10
J. Harrison.....	31 0	M. Middlesbrough.....	£32 5
E. Turner, Middlesbrough.....	£14 6	W. Ridgway.....	£6 15

NEWPORT.—For rebuilding premises, the "Royal George" Hotel, Newport, for The Albion Gate Brewery Company, Limited, Bristol. Mr. W. H. Watling, architect, 21, Bridge-street, Newport. Quantities by the architect:—
A. Lawson & Co. £1,370
J. Mathias 1,420
Wm. Price 1,485
W. Moore & Son 1,384
J. T. Morris 1,315
(All of Newport, Mon.)

NEWPORT.—For rebuilding premises, 38, Commercial-road, for Mr. J. Derrett. Mr. W. H. Watling, architect, 21, Bridge-street, Newport. Quantities by the architect:—
A. Lawson & Co. £494
J. T. Morris 493
R. Williams 523
T. Webb 523
J. Langmaid 499
D. Farrit 494
(All of Newport, Mon.)

NEWPORT.—For rebuilding premises, No. 37, Commercial-road, for Mr. T. Lammey. Mr. W. H. Watling, architect, 21, Bridge-street, Newport. Quantities by the architect:—
A. Lawson & Co. £157
D. W. Richards 157
T. Webb 157
J. Mathias 157
J. T. Morris 157
(All of Newport, Mon.)

NEWPORT.—For rebuilding premises No. 35, Commercial-road, for Mr. R. T. Mann. Mr. W. H. Watling, architect, 21, Bridge-street, Newport:—
J. T. Morris £200
J. Linton 200
E. C. Jordan 200
J. Charles 200
W. Moore 200
(Quantities by the architect)

NEWPORT.—For rebuilding premises, No. 36, Commercial-road, for Mr. Philip Green. Mr. W. H. Watling, architect, 21, Bridge-street, Newport. Quantities by the architect:—
J. T. Morris £178 0
J. Langmaid 178 0
J. T. Morris 178 0
A. Lawson & Co. 178 0
Smith Bros 178 0
E. C. Jordan 178 0
(All of Newport, Mon.)

NORTON (Co. Durham).—For the erection of school buildings at Norton, for the Norton School Board. Mr. W. H. Linton, architect, 15, Exchange, Stockton-on-Tees. Quantities by architect:—
A. J. Cooke £444 4
W. Mitchell 444 4
Craggs & Benson 444 4
W. C. Atkinson 444 4
(Accepted. Architect's estimate, £583 11s.)

PORT TALBOT.—For the erection of a hotel, Bryn. Messrs. Thomas & James, architects, Port Talbot:—
J. Rice £1,478
Morgan Cox 1,480
(Accepted.)

RADYR (Wales).—For the erection of two villas. Messrs. Griffiths & Jones, architects, Tonypandy:—
W. Cox £1,440
W. Spitt 1,440
D. Evans, Sons, & Co. 1,440

RAINFHAM (Essex).—For building twelve cottages, for Mr. E. R. Blewitt:—
J. Baxter, Upton Park £285 0

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REIGATE.—For the erection of a house in Manor-road, Reigate, for Mr. G. Taylor. Mr. C. E. Salmon, architect, Bell-street, Reigate:—
R. Kullik £1,067
T. Busby 1,067
E. J. Saunders 1,067
(Accepted.)

SHILDON.—For the erection of thirty-three dwelling-houses, Mr. W. Perkins, architect, Main-street, Shildon:—
L. M. Dennis, Shildon £2,915 5
(Accepted for masonry and joinery.)

SOUTH STOKE (Usual).—For the erection of schools, residence, &c., Woodcote, for the School Board. Mr. S. Johns, architect, St. Mary's-street, Wallingford. Quantities by Mr. S. G. Goss, 25, Bedford-row, London:—
Goodall £2,155
Rit 2,155
Robinson 2,155
Not signed 2,155
(Reading (accepted). 1,946 18)

STANMORE.—For erecting a house in Gordon-avenue, for Mr. F. Garrett. Mr. Horace Field, architect. Quantities by Mr. R. W. Griffiths:—
McComick & Sons £3,361
J. S. Kimberley 3,361
Roland Bros. 3,361
Kitty & Sons 3,361

SURBITON (Surrey).—For rebuilding the "Rising Sun" hotel, for Messrs. Charnington & Co. Mr. Thos. Timberley, architect, Surbiton. Quantities prepared by Messrs. Jas. Hood & Sons, 37, Walbrook, E.C.:—
W. M. Norton £2,647
Adkins Bros. 2,647
W. Nash 2,647
J. H. Jarvis 2,647

TONYPANDY (Wales).—For the erection of a public library. Messrs. Griffiths & Jones, architects, Tonypandy:—
Morgan & Williams, Tonypandy £1,188
(Amended and accepted.)
[All internal fittings, &c., not included.]

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G. R. R. & W. (amateurs should have been stated).—E. W. (below our limit).

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VOL. LXXIV. No. 2886.

JUNE 12, 1886.

ILLUSTRATIONS.

Proposed Mansion.—Mr. H. Heathcote Statham, F.R.I.B.A., Architect	Double-Page Photo-Litho.
"Hildon," Hants.—Mr. Aston Webb, F.R.I.B.A., Architect	Two Double-Page Ink-Photos.
Bronze Bracket: Italian Sixteenth Century.—Drawn by Mr. H. F. Waring	Single-Page Ink-Photo.
Chimney Piece in Carved Stone, from a Palace near Brescia.—Drawn by Mr. H. F. Waring	Single-Page Ink-Photo.

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At Chantilly.



N the *Builder* for July 26 and August 2, 1884, will be found a historical sketch of the Château of Chantilly, published then as an anonymous contribution, but written, we may now say, by no less a person than the late M. Charles Yriarte. At that time nothing had been said as to the intention of its owner to leave the château and its contents as a legacy to his country, if the intention were then formed. The account was written apropos of the completion, just at that time, of the rebuilding of the portion of the château which had been demolished at the Revolution. Now that the whole building, ancient and modern, with its contents, has passed into a new phase of existence and become public property, it was impossible to be at Paris without making a visit to it, and considering the restored palace and its collections from an English point of view.

Chantilly is about thirty miles by rail from Paris (twenty-five in a straight line) and it may be as well to say that the Château which is conspicuous to the right of the railway, just after passing Chantilly station on the road to Paris, is not the château of Chantilly, though generally taken for it by railway travellers; the Chantilly palace is on the other side of the railroad and is not visible from it. Since it was opened to the public on Sundays, Tuesdays, and Thursdays, the Nord railway company have run express or what they call "excursion" trains to Chantilly; but the intending visitor, after he has discovered the special train and its special booking-office, for which he will probably receive three different directions from as many different officials (for French terminal stations are all like Waterloo Station—no one knows anything), will also discover that while in England an excursion train always means a cheap train, in France it means one for which you pay extra.

Once started, however, the train does run there without stopping, and the transit is quick enough; and as the gates of the château are not opened till noon, there is

time to walk there leisurely by the drive that runs through the beautiful woods, a much pleasanter way than going by the town. On emerging from the wood we come on the château from much the same point of view as that shown in the lithographic illustration, from M. Daumet's drawing, published in our issue of July 26, 1884. The view is rather a shock to the visitor who has had anything like the idea of a French Renaissance château in his mind, for from this point of view nearly all that can be seen is redolent of the Ecole des Beaux-Arts. The accompanying plan (see next page) will serve to explain how the land lies. The block marked A, once the old portion of the château, is now the new portion, built from the designs of the Duc d'Aumale's architect, M. Daumet. This portion follows the lines of the mediæval château, and is at least the third building on this part of the site. The foundation is known to date from at least the thirteenth century, and how many times the mediæval château may have been rebuilt there is no knowing; but the latest mediæval version of it was still in existence when the Constable Anne de Montmorency, about 1540, gave it a Renaissance face to the interior of the courtyard, retaining the mediæval exterior with its machicolated towers (the same kind of alteration which was made to so many Scotch castles in the Renaissance period), and at the same time added the other and smaller rectangular block (B), which was called the Châtelet, and was designed by Jean Bullant, and is almost the only ancient portion of the château now left. About the middle of the seventeenth century "the great Condé" pulled down and rebuilt the whole of block A, except the circular angle towers, and the bases of the towers flanking the main entrance, and refitted the interior of the Châtelet in the taste of his own day. Block A, as before observed, was destroyed during the Revolution, and has now been again rebuilt by the Duc d'Aumale. Only the bases of the mediæval towers still remain as records of its ancient history. When the Châtelet was first built it was separated from the larger block by an arm of the moat crossed by a connecting bridge; this moat was filled up, and the bridge consequently abolished, by the last owner of the Condé line, in 1820. It should be added that the Châtelet stands on a much lower level than the larger block, its first floor,

being nearly on a level with the ground floor of the latter.

On approaching the château, one is impressed by the large scale of the surroundings. The courtyard gate and bridge are approached by a long sloping causeway of old uneven paving, at the top of which is the open space called the courtyard of the Connétable, from the equestrian statue of the Constable Anne de Montmorency which formerly stood there, and was broken up at the Revolution, to be replaced now by M. Dubois's fine group illustrated in the *Builder* of June 19, 1886. Beyond the statue, to the northward, a mighty flight of steps of great width, more like a hill than a staircase, devised by Le Notre, descends to the gardens. All round the buildings extends a wide moat, full of great carp.

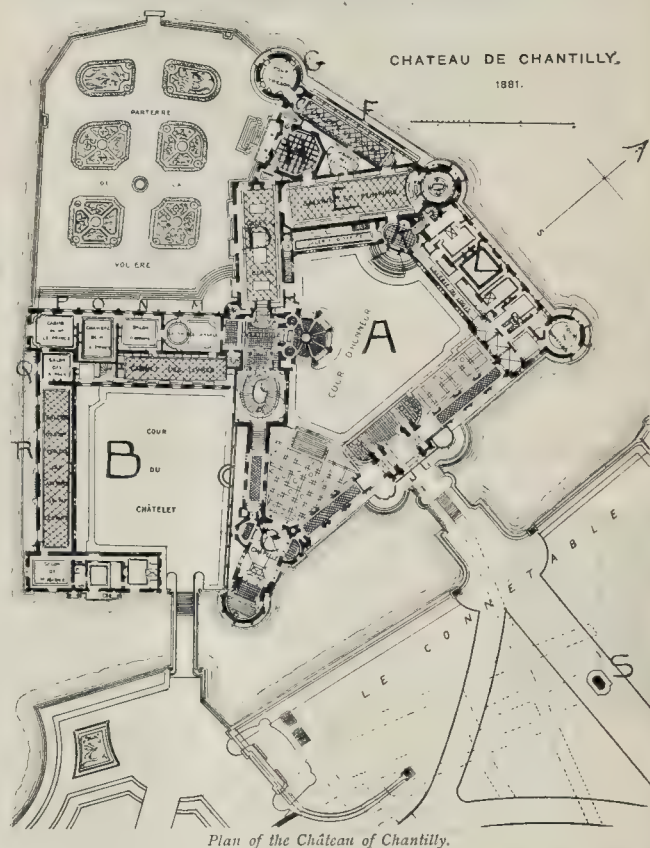
On entering the triangular courtyard the general impression of the new buildings is, as already observed, that they are redolent of the Ecole des Beaux Arts; and however they may appear to French eyes, to the English eye they present a cold, formal and conventional architecture; very much the same, indeed, as one sees in the new Apartment houses of the more costly class in Paris, only treated in a somewhat broader and more dignified manner. After all, however, it may be replied that at least the French have got a school of modern architecture, more decisively than any other nation can be said to have at present; one seems to meet the same style and the same details everywhere in new buildings on which any money is spent; and according to some theories about national architecture this ought to be right. No doubt the architecture thus produced on school lines is always good and scholarly, in a sense; but it cannot be denied that it is cold and monotonous. At the southern angle of the modern building the architect has introduced a touch of modern mediæval treatment in order to distinguish the chapel—a high-pitched roof and a flèche and angle pinnacles, in which there is a general look of mediæval outline, though the details on closer examination are found to be of Renaissance type.

For the main entrance we cross the Cour d'Honneur to the semi-octagonal porch; the entrance hall is on the same level with the principal floor of the Châtelet, the range of rooms of which opens right opposite the entrance door; the floors of the new château

the "Galerie des Cerfs" (which has the appearance and furnishing of a large dining hall) on the right, and the chapel on the left, are reached by short flights of steps. Between the vestibule and the chapel corridor the grand staircase, which leads downwards and not upwards from this floor, and which is barred to the public, is surrounded by a balustrade in hammered and polished metal, made by Moreau frères from the architect's design, which is one of the finest specimens of sumptuous work of this kind to be seen anywhere. Among the most prominent objects around the staircase are also some very fine lamp-bearing statues, caryatides, by Chapu. Mounting the steps to the corridor leading to the chapel, one is astonished on the other hand at the commonplace leaded and tinted glass, the sort that in England is satirically called cathedral glass, inserted in the windows here; a kind of thing that certainly no English architect would allow in a building of this pretension. But the interior of the chapel is a compensation. This chapel, called the "Oratoire Saint-Louis," is ecclesiologically regarded as only the last rebuilding of a chapel founded at the commencement of the fourteenth century, and successively rebuilt in the sixteenth, eighteenth, and nineteenth centuries. Here there is an altar by Jean Goujon, and a quantity of wood fittings of the middle of the sixteenth century, formerly belonging to the chapel of the Château d'Ecouen; there is a great deal of inlaid ornament in this, which, for exquisite and delicate finish and for its perfect preservation, must, as the phrase is, be seen to be believed; it is something unsurpassable in its way.

To get to the rest of the new building we have to return down the steps and through the vestibule and up the opposite steps to the "Galerie des Cerfs" (the revival of an old name), a splendid room containing a long table which is a monumental piece of work. The ceiling is decorated with the armorial bearings of the families which have possessed Chantilly since the twelfth century. Among the other objects in this room are some very fine furniture, some Gobelin tapestries of the seventeenth century, and two decorative paintings by Baudry. The artificial lighting is arranged for in an effective and fanciful manner; a series of bronze arms project from the walls, the hands formed as candlesticks or lamp-holders. The Salon de Peinture, a gallery of about the same size, opens out of the end of this one, to the right. The collection of pictures in this gallery is of more interest in a historical than an artistic sense; it includes specimens of the works of a good many painters of different dates and schools, some of them rather out-of-the-way names; but as old masters, they are all works of secondary value and interest, and a collection of second-rate old masters is a somewhat depressing spectacle. At the end of the gallery the space occupied by the circular turret is worked into a good piece of interior architectural effect, a kind of small rotunda separated by a colonnade from the main room, and with the ceiling painted with an "Enlèvement de Psyche" by Baudry.

Opening from the end of the Galerie de Peinture is the long narrow "Galerie de Psyche," running along one face of the exterior line of the château, and containing a very curious series of windows in grisaille, executed by order of Anne de Montmorency,



Plan of the Château of Chantilly.

REFERENCES.

- | | |
|-----------------------------|---|
| A The Modern Château. | L Museum Wing. |
| B The Châtelet. | M Antichamber to the suite of the Prince de Condé, in the Châtelet. |
| C The Chapel. | N Salle des Gardes. |
| D Galerie des Cerfs. | O "Chambre de M. le Prince." |
| E Picture Gallery. | P "Grand Cabinet de M. le Prince." |
| F Galerie de Psyche. | Q "Salle des Singes." |
| G Cabinet des Gemmes. | R "Galerie où sont Peintées les Actions de M. le Prince." |
| H Tribune. | |
| K Vestibule to Museum Wing. | |

S Statue of Anne de Montmorency.

1542-44, and originally fixed in the Château d'Ecouen. They represent forty-four scenes in the legend of Cupid and Psyche as told in the *Golden Ass* of Apuleius, and are attributed to Michel Coxie. These form a most curious example of Renaissance art of the period. The same gallery contains a number of examples of the painter François Clouet, mostly portraits of personages of historic interest; besides examples of other French painters of the same period. At the end of the Psyche Gallery is the "Cabinet des Gemmes," formed in one of the circular turrets, and containing a number of objects both of artistic and historic interest, among which may be specially mentioned the Grand Cross from the treasure of Bâle, and various examples of German silversmiths' work of the thirteenth and fifteenth centuries. In the triangular space between this gallery and the Picture Gallery is formed the octagonal hall called the Tribune, a fine and lofty apartment which contains a good many pictures of real value, especially examples of some of the masters of the French school of the earlier part of the present century; Ingres, Delaroche, and others.

The wing of the building extending along the front in the opposite direction from the

Psyche Gallery is laid out as a regular museum, with a succession of small rooms to the front, and two narrow parallel galleries in its rear. The front rooms contain a great many of the smaller pictures of the collection, mostly of the French school, and including many fine works by Ingres, Decamps, Gerome, Gericault, and many other well-known names; and in a purely artistic sense this is the most interesting portion of the picture collection. In the oval vestibule at the re-entering angle of the courtyard is a great Japanese bronze vase which must be one of the finest things of its kind in existence.

Coming back to the main vestibule of the château we enter from it the range of rooms belonging to the Châtelet. This is the most interesting portion of the interior, as most of the furniture and other objects are ancient, and many of them belong to the date when the Prince de Condé refitted this portion of the building, even if they are not part of the original furniture of his restoration. There is a suite of rooms entered in the old fashion through each other. We pass through the Antechamber, the Salle des Gardes, the "Chambre de M. le Prince," the "Grand Cabinet de M. le Prince," a splendidly

decorated and furnished room, the "Salle des Singes," with a fanciful painted decoration in which monkeys predominate, and attributed to Christophe Huet, and thence enter the long and (to modern ideas) low gallery, "où sont peintes les actions de M. le Prince." The paintings are a series by Lecomte, of actions in which Condé was concerned; there are busts of Turenne and Condé on each side of the sumptuous mantelpiece, and various fine pieces of Louis Quinze and other furniture. As we walk through these rooms, looking out on the formal parterre below, and especially in the long reception gallery where the greatness of "M. le Prince" seems to be everywhere proclaimed, one can half realise the large space filled in the life of those days by the figure of the great aristocratic soldier who was hardly second in importance to the King himself, and conjure up in imagination the superb fêtes and receptions which once filled that gallery—all swept away to make room for a common-place Republic, with a respectable tradesman at its head. The Republic is no doubt much the more virtuous institution, but it cannot be denied that it is less picturesque.

Among the rooms in the Châtelet is also the one which has now become the library, where the Duc d'Aumale's collection of rare and curious or beautifully bound books, to the number of about 13,000, has been arranged. This is the long room opening out of the antechamber, and parallel with it and the Salle des Gardes. Visitors are at present only admitted to one end of the room; the library is in process of being catalogued; but we understand that access will be given to it when this is done. Students can however consult any books there under certain conditions and on proper application.

The whole of the modern part of the chateau has been really built as a private art museum and an example of modern French architecture based on the ancient style; and it is in that light that it must be regarded. As far as the very multifarious contents of the Musée Condé, as it is now called, are concerned, there is perhaps room for a little disappointment. There are numbers of curious and interesting objects—china, tapestries, many others which we have not touched upon; but the number of things which are of the highest value as works of art, apart from historical interest, is not so great as might have been expected. A visitor who was in France for the special purpose of studying the history of French painting, however, assured us that the value of the collection of paintings, in that sense, had surpassed his expectations; and the number of curious and out-of-the-way objects of ancient work of different kinds, which are to be met with, renders a walk through the galleries a series of surprises. In fact the collection will be more appreciated, perhaps, by those who visit it for the purpose of study than by those who expect to see a great art-exhibition. Architecturally the exterior of the Châtelet is a beautiful piece of work of its period, only suffering from having been too much cleaned up by the architect for the restoration; and the new building, though modern in style, at all events follows the lines of the ancient one, and gives us, with its moat and its other surroundings, a tolerably good realisation of the general aspect

of a French palatial chateau of the later Renaissance period, discounting the differences in detail.

Visitors who approach by the street, however, and not by the park, will find near to the end of the small town a great late Renaissance building totally untouched and un-restored; the immense and palatial stables, namely, erected by Prince Henri de Bourbon in 1719-35, and which, if they were nearer to the chateau, would fairly eclipse it. This is a vast building as large as a cathedral, consisting, as one may say, of two long aisles divided by a great open space in the centre—a square with the angles cut off, and surmounted by a cupola. Externally the building is a vast and symmetrical mass of rusticated masonry. Internally the two aisles are roofed with a stone semicircular barrel vault with broad flat ribs dividing it into bays, and Welsh vaults between to the windows. In the central paved space, which is large enough to exercise horses in, is a magnificent stone drinking trough against the wall, covered with sculpture, and backed by a great stele or pyramid rising behind it, bearing the inscription—"Louis Henri de Bourbon, VII. Prince de Condé, a fait construire cette écurie et les bâtiments qui en dépendent: commencés 1719 et finis 1735." High up on the wall are stags and other heraldic emblems sculptured in relief. One of the aisles is nearly filled with modern stable fittings, the other is completely empty and bare. But the appearance of this sumptuous and monumental building, erected merely for stables and as a dependency to a private mansion, gives one a vivid idea of the sumptuous and stately nature of the life led by great French nobles in the eighteenth century. To be sure, when one reflects that the money for all this was probably wrung from the blood and sweat of the French peasantry, one feels that there is another side to the picture; but the building is at all events harmless now, and, to an architect, it is certainly the thing best worth seeing at Chantilly.

A GRAPHIC METHOD OF SETTING-OUT THE FACE-ANGLES OF SKEW BRIDGE VOUSOIRS.

BY H. H. HUMPHREYS, A.M. INST. C.E.

THE setting-out of arch voussoirs for the face of skew bridges is confessedly a somewhat difficult task, as a considerable knowledge of descriptive geometry is required, in order to lay down lines for the various templates required by the stone-mason.

Peter Nicholson was the first to grasp the problem in its entirety, and his work upon the subject is still the best book extant. Unfortunately the last edition is out of print, and as second-hand copies are scarce and exceedingly expensive, they are out of reach of the majority of engineers who are engaged on skew bridge work. Mr. J. H. Watson Buck's work is an admirable text-book, but it carries one rather further into the mathematics of the subject than is useful or desirable, when the same results can be obtained by less complicated graphic methods.

The crux of platform work is undoubtedly the setting out of correct templates for face angles—that is, angles contained between the coursing osculatory circle and the face joints of the arch. Nicholson only gives a

method which approximates to correctness, but the way devised by Mr. W. H. Barlow, and given in Mr. Watson Buck's book, is entirely correct; it has, however, one serious disadvantage, viz., it is harder to follow than a graphic method.

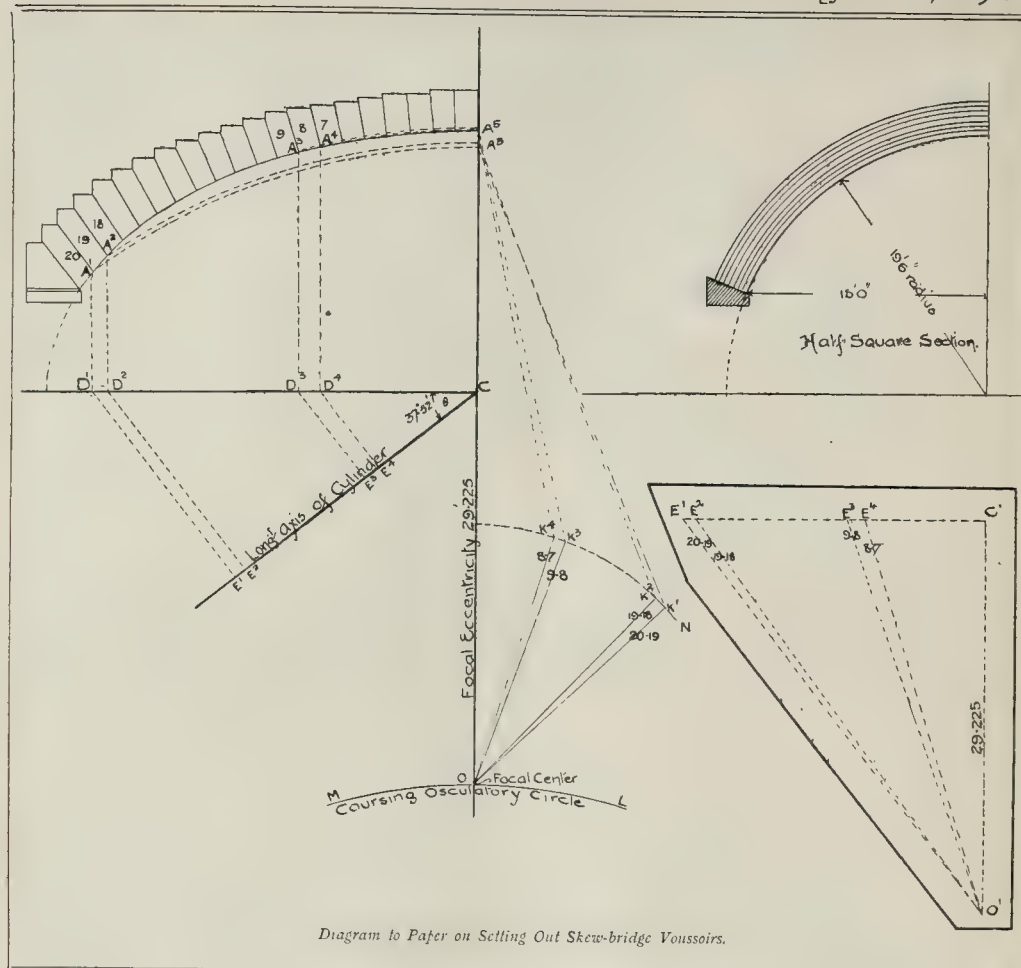
When getting out the working drawings for several oblique arches, my then chief (Mr. D. Connery, M.E., A.M. INST. C.E.) devised the following solution for the vexed problem, and he has subsequently given me permission to publish it, insisting all the while that some credit is due to me for the discovery. I much regret that his view of the matter is incorrect, and if credit be deserved by myself, it will only be due for the publication of a method which I believe to be the most simple yet given. It must be clearly understood, however, that this article is not a general exposition of platform work in connexion with skew arches, and therefore a knowledge of the "developments" and spiral surfaces is assumed for the reader, as is also a familiarity with the usual terminology employed.

Let us suppose that, in accordance with the usual custom, one half of the skew elevation of the arch has been set out at full size upon the platform, in order to obtain the zinc face moulds, and that the face angles are now required to complete the template lines. The example given in the diagram (see next page) is from an arch, segmental in square cross section, and having a radius of 19 ft. 6 in. The line D'C will, of course, have been laid down on the platform in order to obtain the foci of the ellipse forming the intrados of the arch.

From the point C set off the angle of skew (θ), in the present case 37 deg. 52 min., and produce CE' until a perpendicular from the end of it is approximately vertically below the springer. At O (the focal centre) strike out the osculatory circle MOL. Imagine that the diagram is hinged on the line D'C, and that therefore this line serves the double purpose of being the transverse axis of the cylinder (cut on the skew), and also the plan of the face line of the arch; imagine also that the line E'C is the plan of the longitudinal axis of the cylinder and that it is therefore in a plane which is at right angles to the plane of the face elevation.

Since O is the focal centre, it obviously lies in the same plane as the face of the voussoirs, and all joints produced will therefore pass through it.

Suppose now that a rod of the length of the square radius (19 ft. 6 in.) is fixed to the longitudinal axis line in such a way that it must always be at right angles to it, if considered in plan, but is free to revolve around and slide along it, it is plain that the loose end of this rod can be made to just touch each of the face joints in turn if it is moved forward along the axis line; drop perpendiculars from any of the required face joints A' A' A' A' on to the line D'C; raise perpendiculars from the line E'C to intersect the points D' D' D' D', and consider that the radius lines D'E', &c., have been produced across the beds of the voussoirs; it is evident that these radius lines will intersect at right angles a tangent to the coursing osculatory circle at any of the points A' A' A', &c., and that the angle between this radius line and the face of the voussoir will be the angle required. An imaginary triangle has now been formed, of which one side is always the varying distance A'O A'O, &c. The second side is



equal to the radius of the cylinder, and the third is the true distance from $E^1 E^2$, &c., to O , and which is given in the side diagram; this length, of course, varies with each joint. It remains then to describe a triangle, of which three sides are now known.

With the centre O and distances $OA^1 A^2 A^3 A^4$, &c. From O with a radius equal to the square radius of the arch describe an arc K'N. From the four points A^3 , and, with lengths taken from the side diagram equal to $E^1 O E^2 O E^3 O E^4 O$, strike out arcs to intersect K'N at $K^1 K^2 K^3 K^4$; then the angles K'OM K²OM will be the face angles required.

Н. Н. Н.

NOTES.

WE recently noticed that the Preventive Measures against Fire in the City. Cripple-gate street improvements were not to be taken in hand. This short-sighted decision of the authorities has been immediately followed by another warning in the form of a large fire in Tooley-street, where the destruction of a warehouse of considerable dimensions kept some couple of hundred firemen employed for many hours. Almost simultaneously with this fire we find, on the one hand, the Chamber of Commerce taking action with respect to fire protection by approaching the London

County Council on various matters relating to the Building Acts, and on the other hand, we find that a certain section of the Corporation is showing its interest in the better protection of the City by calling upon the Engineer to report on a variety of subjects arising out of the Cripplegate fire. That the Chamber of Commerce should have taken the matter up is a sure sign of the dissatisfaction of those primarily interested in the question, *i.e.*, the City merchants and warehousemen, who are tired of being continually exposed to losses owing to the mere chance of a neighbour's house having taken fire. As regards the City Engineer's report on possible improvements in the City, we do not wish to touch on it until some action on the part of the Corporation may be seriously anticipated. When, however, we learn from this report that the City area, with its 27,000 houses, has only thirty-five public fire alarms, we cannot but point out that this is, perhaps, one of the defects which most urgently requires remedy. We need not go so far as in some American cities, where 27,000 fire alarms would be advocated for 27,000 houses, but we certainly hold that every block or every important crossing in the City area should have a conspicuous and automatic alarm, with such necessary indicators as to make them easily visible both

by day and by night. A deficiency of conspicuous alarm posts simply means courting a second conflagration, quite irrespective of any questions of construction.

Overcrowding in Trains. A NEW and very elaborate code of by-laws has just been submitted to the Board of Trade

by the North-Eastern Railway Company, with the object of furthering the comfort and safety of passengers. The *Times* of Tuesday last devotes two columns to the reproduction of these by-laws, some of which are nominally in force at the present time, while others are amplifications of existing rules. One of the latter is a very stringent regulation dealing with the subject of overcrowding, and commences as follows:—"When a compartment contains the full number of passengers which it is constructed to carry, no additional person shall enter or remain therein if requested by any passenger therein or by a guard of the train or any duly authorised servant of the company not to do so." A decided innovation follows, it being provided that on failure to quit immediately upon being thus requested, the offender "may be removed by or under the direction of such guard or servant." This opens up a stirring prospect, and it remains to be seen

ow the summary ejection clause will work. By a singular coincidence, Tuesday's papers also report a case in which the Great Northern Railway have been suing a passenger who raised an objection to his compartment being overcrowded. He resisted the intrusion of excess passengers, and his efforts unfortunately resulted in the carriage window being broken. The judge, however, held that he was justified in what he did, and gave judgment in his favour. Under the circumstances, we should think that the company will hardly exercise the right they obtained to appeal against this decision.

At the performance of the scenic deficiencies of Covent Garden, which was supposed to be on Bayreuth precedent, there was little to complain of as regards the orchestra, and many of the singers were superior to those who have lately been engaged at Bayreuth. But as regards scenery and stage effects we are still lamentably below the Bayreuth standard, although, of course, there were considerable improvements compared with what we were accustomed to under the ordinary management. That the mounting should have been, comparatively speaking, so weak, and this, although new scenery was painted both for the "Rhein-Gold" and the "Götterdämmerung," can be only ascribed to the lack of those mechanical contrivances without which no modern Continental stage is to-day complete. Many of the effects, too, although ingeniously contrived—such as the swimming of the Rhine maidens—were marred by the bad lighting of the stage, which, besides preventing any semblance of realism, led to many incongruities, and to ugly shadows being thrown on the backcloths. In the presentation of the "Walküre" at Bayreuth, the difficulties that would be encountered by the hero crossing a "Wagner fire" can be well appreciated by the audience; at Covent Garden the whole effect of the music and acting was marred by a lack of reality, for it was obvious that any child could walk across what was here called "fire." We cannot dilate here on the many anomalies in the mounting of the "Nibelungen Ring" at Covent Garden, or the unbusinesslike mistakes in the scenic arrangements, but we may call attention to the general mediocrity of the mounting as an object lesson, inasmuch as it showed plainly that, even with the assistance of Herr Kranich, the eminent Bayreuth stage mechanist, to superintend matters at Covent Garden, it is impossible to simulate nature if the foundation is not given in the form of practical appliances. The Covent Garden stage, besides being notoriously a source of considerable anxiety from the fireman's point of view, is too antiquated for modern requirements. The sooner it makes room for a new installation the better.

In a paper on "The Abuse of Power Houses," read to the Association of Municipal and County Engineers at Yarmouth by Mr. Preece, C.B., F.R.S., the President of the Institution of Civil Engineers, the common practice of having several central stations, where one would be sufficient, is strongly condemned. He points out that in a town where the Corporation supply the electric light and a private company manages the

electric tramways, we may have the anomaly of two power stations side by side where one would not only be sufficient, but would lead to great economy in running costs. The remedy he proposes is that the Corporation works should supply the tramway company with energy as cheaply as the company make it for themselves, and so abolish the necessity of another power house, and probably greatly cheapen the price of the electric light. We quite agree with Mr. Preece in his remarks about the desirability of reducing the number of power stations, and allowing new ones to be built only where the smoke, condensed vapour, noise, and vibration inseparable from the working of a power station would be least offensive, and where their tall chimneys would not disfigure the view. In his description of the ideal power house, built on the side of a river where water is abundant and available for condensing, where coal can be delivered with the least cost, and where ashes and dirt can be easily taken away in barges, he seems to have had the Deptford station of the London Electric Supply Corporation in his mind. Now that a Joint Committee of the Lords and Commons have recommended that compulsory powers for purchase and for way-leaves for mains be granted to those who find it necessary, for public purposes, to establish their power houses outside their own area of supply, we hope that the legal difficulties which are in the way at present will soon disappear.

The Latest Gas. *Krypton* (Gr. κρυπτός, "to hide") is the name given by Professor Ramsay to the gas which he has recently discovered as a constituent of the atmosphere. It is but a few years since argon and helium were added to the list of identified gases, and Professor Ramsay, whose name was associated with both discoveries, is to be congratulated upon his latest achievement. Beyond the fact that krypton is a hitherto unknown gas which undoubtedly exists in small proportions as a component of the air, very little is yet discovered about it; but it exhibits distinctive spectrum lines, and is believed to be an element. It is said that as far back as 1894 observers had detected the bands produced by krypton in the commingled spectra of certain atmospheric gases, at the time argon was undergoing rigorous examination; but the gas was not isolated, examined, and classified. The name "krypton" is not altogether a happy one, since the gas is no longer "hidden," and in common with every other element only remained hidden until the powers of human observation had become sufficiently developed to be able to recognise its presence in the matter around us. Until, however, the relationship which probably exists between the elements is discovered, a systematic elementary nomenclature cannot be made, and "krypton" will serve as a name quite as well as many of those already familiar in the ever-lengthening list of elements.

A Serious Danger in Swimming-baths.

The case reported a few days ago in the daily papers, of the dreadful death of a poor lad in the Corporation Swimming-bath at Cheltenham, ought not to be passed over without special comment. The valve had been opened to empty the bath while it was still in use, and the poor youth in question was

drawn by the outgoing current to the opening of the discharge-pipe and partly sucked into it. The coroner's jury returned a verdict of "accidental death," while censuring the caretaker for his neglect of the bath regulations (a verdict in our opinion very much short of what the circumstances demanded), and they also recommended the Corporation to have a grid placed over the waste water conduit. It would be better for some reasons to have a grid over it, no doubt, but that would not prevent a similar accident; the suction of the water would hold a swimmer down against the grid, and drown him just as certainly. It is a very serious matter that people using a swimming-bath should be exposed to such a danger by the mere carelessness of an official.

German Criticism on the Underground Railway. *THE Wiener Bauindustrie-Zeitung* for June 9 contains a long and interesting article on the London Underground Railway. The difficulties encountered in the work and the generally successful surmounting of them are appreciatively described. The following little piece of adverse criticism, however, is not uncalled for:—"The stations externally are not well distinguished from neighbouring buildings; a soot-blackened inscription alone marks their character. For example, the station at Westminster Bridge is approached by a narrow entrance, from which a long corridor leads to the booking-office. On the right hand is the great show window of a baker's shop, so that a stranger entering the station for the first time is in doubt as to whether he is on the right road. At another station the board bearing the name is quite hidden beside a gigantic inscription that, with four lines, covers the front of a five-story building and sets forth in gilt and far-shining letters the fact that in that building are the headquarters of the Salvation Army."

City and Guilds Institute Exhibition. THERE is on view this week, at the Imperial Institute, a collection of the works executed by students in the various crafts for the certificates offered by the City and Guilds of London Institute in their yearly examinations. In nearly all the examinations, there is the double test, practice combined with theory; and the craftsmen have also to pass an educational examination in the technology of their craft. Among the works on view are found specimens of carpentry and joinery, cabinet-making, metal plate work, plumbers' work, bookbinding, weaving in various fabrics, and the usual complement of mediocre work done by persons qualifying as manual instructors in elementary schools. In all, over 13,000 students were examined in the various subjects. Specially interesting to our readers will be the models of carpentry and joinery, executed in many instances with considerable skill; staircases, domes, turrets, vaulting, skylights, panelling are among the subjects taken in hand. As on former occasions, wherever the candidate has been left to design something more than an ordinary door, the result has not been satisfactory; it seems impossible to hope for much in this direction, and we must be content with work which is well executed in itself, without reference to design. The exhibition is interesting as showing the output of educational work in this direction, and the general

level of the exhibits is, if anything, above that of previous years. The Institute is certainly to be congratulated on the results, although much still remains to be done to bring the various arts, crafts, and industries of the kingdom into line with those of other nations.

AN interesting collection of old furniture, needlework, &c., and family portraits, from Bilton Hall, will be sold at Christie's next week. The collection belonged to Addison and his wife, the Countess of Warwick, and, it is said, was for the greater part removed from Holland House, Kensington, to Bilton Hall. The pictures include portraits of Charles I. and his equerry, by Vandyck and Stone; Prince Rupert, Prince Maurice, and the Earl of Holland (beheaded in 1649), by Vandyck; Addison and his daughter (in her childhood), by Kneller; the Countess of Warwick, her father, Sir Thomas Myddelton, of Chirk Castle, Denbighshire, and her son, the Earl of Warwick; Secretary Craggs, who gave Addison some Spanish acorns from which he reared oak saplings at Bilton; Dryden, Lord Halifax, and George Villiers, Duke of Buckingham; and a miniature on enamel of Addison, by Zincke. Addison bought Bilton Hall for, we read, 10,000*l.*, from William Boughton in 1711, five years before his marriage, and there he passed the greater part of the close of his life. After the Countess's death the property was inherited by their daughter, who resided there until her death in 1797, and was buried in the parish church. She devised the Bilton estate to the Hon. John Bridgeman Simpson. Of late years it has belonged to Mr. G. H. Bridgeman. Her father's library, to which she succeeded, was sold at Sotheby's in 856 lots, in May, 1799, for 456*l.* 2*s.* 9*d.* Bilton Hall, which is often confused with the neighbouring Bilton Grange, rebuilt by Pugin, is distant one and a half miles from Rugby, and near Dunchurch, in the country of the Gunpowder Plot. It was erected, it is supposed, in 1623, a date inscribed above the porch. The gabled main front has not suffered much change. Mr. Bridgeman Simpson modernised somewhat the garden side, and rebuilt a gable; but the tall elms, and the gardens of Addison's time, in their old formal style have, it seems, been carefully preserved. Bilton and Dunchurch were granted, *temp.* Stephen, to Pipewell Monastery, in Northamptonshire. The Grange stood on the boundary between the two parishes.

The Paris
1900
Exhibition.

M. HENRI BOUCHER, the Minister of Commerce, has submitted to the President a Report on the state of the works for the 1900 Exhibition. A comparison between these and the works for the 1878 and 1889 exhibitions shows that the works in the present case are relatively more forward than in the case of either of the former exhibitions, and that none of the buildings to be erected present so much difficulty of execution as the Galerie des Machines and the Central Dome of the 1889 Exhibition. The partition of spaces intended for the foreign exhibitions on the Esplanade des Invalides has now been arranged, and in consequence the Champ de Mars is now "interdit" to the public, and direct communication between the 7th and 15th Arrondissements cut off.

In order to get over this inconvenience, an engineer, M. Edoux, has proposed the formation of a subterranean passage to traverse Champ de Mars from east to west, and unite Avenue Suffren with Avenue La Bourdonnais. It is proposed that it should be lighted by electricity, and that closed vehicles should transport people from one point to another, at a charge of five centimes. The cost of the work is estimated at 100,000 francs, and the road is to be converted for a sewer after the close of the exhibition. The scheme has been submitted to the Municipal Council. The Paris people seem to be making this exhibition quite a yoke upon their necks, for the time being. It is to be hoped the result will repay all these inconveniences.

THE summer exhibition of water-colours and sketches of the Dudley Gallery Art Society contains some very good work among a considerable amount of mediocrity. Mr. Topham Davidson's "Summer Time in the Scilly Isles" (279) is a remarkable study of calm sea under bright sunlight, and ought to have been better hung, instead of being placed close to the door where people are liable to pass it by; but perhaps it was necessary to keep it out of the way of the President's sea pictures. If the Society could enter into a bargain with their President not to exhibit it would be better for the exhibitions. Generally speaking, the really good works are some of the small and carefully studied landscapes by Mr. G. Marks, Mr. F. C. Coleridge, and others, and some of the freely-executed sketches and studies by a group of clever lady artists who have exhibited there for three or four years back—Miss Margaret Bernard and Miss Rose Douglas especially. Another lady, Mrs. Bessie Johnson, exhibits a quite admirable picture of "The Sphinx" (174) in strong sunlight. An exhibitor whose name we do not before recall, Mr. Duassut, has some excellent works, especially "Near Chiddingstone" (222), and Mr. David Green's sketch entitled "Spring Time" (229) shows the broad and certain handling, in a rapid sketch, which comes from certainty of observation and of method.

At the Dutch Gallery, 14, Brook-street, is a small collection of pictures, chiefly French and Dutch, among which are some fine things: A beautiful little landscape by Rousseau, "After the Storm," also a black and white study by the same painter; two or three good works by Maris—a small oil sketch "The Towing Path," with a foreshortened horse in the foreground, is very good; a fine landscape by Mauve, "The Moor"; and an interior of a cow-house, "Milking Time," by Mr. Edward Stott, which is a very interesting and original piece of work. There is also a forest scene by Diaz, which however strikes one as rather more Diaz than nature. At "The Studio," Beaumont-road, close to West Kensington Station, two English lady artists, Miss A. Robertson and Miss C. F. Costerton, who have been for some years working together in Paris, have opened an exhibition of their joint works for a few weeks, which will be found interesting. Miss Robertson's portraits display a good deal of originality in feeling and colour; there are also some

landscape studies showing a great deal of feeling for effect and a certain individuality in the way of looking at things. Miss Costerton devotes herself mainly to miniature painting, and her works of that class are of high merit.

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

DOMESTIC architecture is rather largely represented among the drawings at the Academy. There are houses, some of them tolerably large ones, designed in a serious manner; there are some small works of special and picturesque character; and there are those which, though illustrated as modern buildings, have too much the appearance of being drawings of old ones. Mr. Arnold Mitchell's "House at Milford-on-Sea" (1597), comes to a certain extent under the latter category; it is a beautiful specimen of effective drawing and tinting, but the whole handling goes to give it an appearance of the texture and weathering of an old building, and the details are mostly familiar in old buildings of a certain date. A new house can hardly in reality look as this does in the drawing. A plan is given; its characteristic is a hall larger in proportion to the size of the house than is usual, but this is no bad way of treating a moderate-sized house. To have the drawing-room door exactly opposite the door which leads not only to the entrance vestibule but also to the gentlemen's lavatory is not quite the best arrangement, but in the main the plan is a good one. Mr. Edgar Wood's "House at Middleton" (1675-6) again looks too much like a sketch of a rather dilapidated old house; Mr. Baillie's Scott's "Proposed House at Douglas" and Messrs. Ernest George and Yeates's "Okewood" (1,600), have the appearance of old manor-houses, and Mr. Brierley's "Design for Stables" (1,745) might be entitled "Old Farm Buildings at —." They all make very pleasant drawings, but the effect is rather factitious, nor can we see any particular advantage in giving this air of antiquity to a modern house. All the old houses looked new once.

The two largest houses illustrated are Mr. Aston Webb's "Hildon House, Hants" (1,767), illustrated in our present issue, and Mr. Belcher's "House at Pangbourne" (1,752, 1,753, 1,768). Hildon is a very pleasant-looking quiet house surrounding three sides of a courtyard, and has some of the characteristics of houses of an older date without actually imitating them in a deceptive manner. We are enabled to give the ground plan, which is not given on the exhibited drawings, and a few words of explanation from the architect, to be found under the head of "Illustrations." Mr. Belcher's "House at Pangbourne" rather illustrates what we have remarked upon before as to the want of the element of dignity in modern large houses; this is a symmetrically designed house as far as the front here shown is concerned, but it is not dignified; it is too much broken up for that—with intention no doubt; the preference now is for the picturesque rather than the stately element in a dwelling-house, but we rather doubt if then will not be a reaction presently in favour of stateliness. The interior of the entrance hall is shown in No. 1,752; an apartment with a cross-vaulted roof with the surface of the vault covered with strap-work decoration in the Elizabethan manner; this breaks round the meeting edge of the vault, without any moulding or groin rib, in a manner which is piquant, but gives rather a ragged line. No. 1,768 is a fine bold line-drawing of the entrance tower of the same house.

In "Design for a New Church, Caerhŷn, Conway" (1,601) a little drawing which escaped our notice when going through the churches, Mr. H. L. North shows in small coloured geometrical drawings a very nice design for a small country church, proposed to be built of local gray granite and white Penmon stone; the plan shows two aisles with a central arcade, the chancel arch being apparently a double one at an angle of 45 deg. each way from the terminating pier of the arcade. A perspective sketch of the church is shown in No. 1635; the two should have been placed together. In "Proposed Hotel, Churston" (1,602) Mr. Carvill shows a small hotel design which has the merit of being free from the meretricious display so common in hotel architecture; this is a coloured elevation showing brickwork wings with plastered gables, and the connec-

ing wall also in plaster, or cement; white wall events. In the little drawing of "A Country House at Sutton" (1,612) Mr. E. Runtz shows character, and adds a plan with a compass (often omitted); but we may observe that south is not a good aspect either for a dining-room or a billiard-room. Mr. Street's "Design for a Country House" (1,617) is quite the old style of thing, perhaps intended as a protest against the picturesque vagaries of the day; a square mass of brickwork with a projecting bay a little way from each angle; the plan shows that the principal rooms are well arranged as to aspect. Messrs. Clark and Moscrop's interior of "Gallery and Ball-room Yorkshire" (1,620) shows a dignified room with a large undecorated cove at the base of the ceiling supporting a clearstory and a decorative ceiling; there seems rather a want of some appearance of structural capability in the cove to carry all this; the side of the room is broken by two round-arched recesses, with good effect.

Mr. R. W. Schultz's "A London Garden, St. John's Lodge, Regent's Park" (1,622) is a rather curious affair; a bird's-eye view of a formal garden with two successive circular compartments formed by clipped hedges, the nearer one gay with the colour of flowers. This is one of a class of drawings which have only recently found their way into the architectural domain—an indication of the revived interest in formal gardening. Of the same class is Mr. Manigo Thomas's drawing of "The New Playing Fields, Eton" (1,642), also a bird's-eye view, showing the playing fields laid out somewhat like the environs of Hampton Court; long alleys between the fields, expanding at regular distances into open spaces or squares, placed diagonally to the line of the alleys, and each with a fountain in the centre. Thus is the march of aestheticism invading the school playground. Mr. Thomas's other contribution, "Rotherfield Hall, Sussex" (1,649) is a still more curious one, a small coloured view or elevation of a house seen in the distance, while the greater portion of the picture space is occupied by a large arabesque border which seems to be the primary object of the drawing; the whole thing looks rather like a joke.

We come to a series of rather curious but interesting small drawings in this part of the room. Mr. G. L. Morris's "Proposed Country House near Northampton" (1,627) shows a prime title elevation in red brick and cement (probably), with an entrance doorway variegated with bands of different material, and a plan of a shape, in which the "hall" takes the shape of a long corridor parallel with the front wall; there is a drawing-room (or no room called by that name); no compass is given, so that we form no idea as to the aspect of the rooms. The bedroom plan is an odd-looking one too, but very compactly arranged at any rate, and here is considerable individuality about the whole scheme, shown though it is in small and inadequate drawings. Mr. Walter Cave's "Proposed New Front, 40 James-street" (1,634) is a small coloured elevation of still more harked character. It is very carefully one, and represents a front of green bricks with a white-painted projecting bay running up through three stories in the centre of this front of green brick, with a cornice at the top, above which the gable is apparently of light-coloured stone, very lightly treated. On each side of the upper part of the bay, beneath the cornice, is a "trellis" panel. Altogether this is a very original little drawing. Near this is Mr. Skippworth's curious collection of a series of small drawings of an "Artist's House" (1,630, 1,636), done on brown-toned paper with the flattered portions of the walls put in white body-colour, a little "dodge" which has rather invaded the Academy of late, and which gives a piquant effect to a drawing with little trouble. The two sheets consist of a series of small perspectives both of interiors and exteriors of the house, and very small plans with no names to the rooms, so that they do not tell one very much. Nor is it possible to form much idea from these little sketches as to how the details are to be treated. Nevertheless, this is an interesting and suggestive exhibit.

PARISH CHURCH RESTORATION, SOUTH QUEENSFERRY.—Plans for the restoration of the interior of the South Queensferry Parish Church have been prepared by Mr. McGregor Chalmers, architect, Glasgow, and have been approved of and signed by the Presbytery, heritors, and kirk-session.

THE ACETYLENE EXHIBITION.

The exhibition of acetylene gas generators which is now being held at the Imperial Institute is the first exhibition of any importance in connexion with the acetylene industry which has been held in England. The exhibition is divided into two sections, the one within the north gallery being devoted to appliances not at work, whilst the other, which is very close to the first section, is outside the building, and shows a number of generators at work. The acetylene produced by these working generators is led into the building containing the Cape Colony and other colonial exhibits, and is there burnt in 7-light chandeliers. The total acetylene consumption of one of the 7-light chandeliers is said to be about 5 cubic ft. per hour when all the burners are in use, whilst the light emitted is remarkably white and is of such brilliancy that neighbouring incandescent electric lamps and ordinary gas jets appear dull and yellow in comparison. It is worthy of note that, although the price of carbide in bulk has been quoted at 16s. per ton, the retail price per lb. tin is sixpence. There are twenty-five to thirty different forms of generators on view, and many of them are sufficiently simple to be manipulated by any servant of ordinary intelligence, after a preliminary explanation as to how the apparatus works. A good generator will yield about 5 cubic feet of gas per lb. of calcium carbide consumed.

Notwithstanding the fact that it is almost universally admitted that purification of the gas before use would be very beneficial, few exhibitors make any attempt at purification. As one of the few exceptions, Messrs. Thorn & Hodde's "Incanto" apparatus may be mentioned.

In the manufacture of acetylene, steam is often generated, owing to the heat produced by the reaction of the water upon the calcium carbide, and it is a matter of importance, not sufficiently recognised among the exhibitors, that some means of condensing and withdrawing this should be provided; otherwise an unsteady "jumping" flame is likely to result, owing to the condensation of water within the service pipes.

In selecting a generator the principal points to observe are (1) the heat developed within the generator during manufacture of the acetylene, (2) simplicity of construction, (3) facilities for withdrawing the spent charges of hydrate of lime, (4) where necessary, the arrangement for condensing and withdrawing condensed steam driven off with the acetylene, and (5) the purification arrangements. Few, if any, of the generators exhibited can be said to satisfactorily deal with all these points; nevertheless, many are sufficiently good to form a safe and simple apparatus for the manufacture of acetylene, and to afford a ready means of lighting country houses with the new illuminant.

With regard to the burner, the most important matters to look to are the illuminating value, and the length of time the burner can be used without becoming choked with soot. The burners in use at the exhibition are Naphey burners, and although this burner is not entirely satisfactory, it is, perhaps, the best yet on the market.

Provincial towns, such as Manchester and Birmingham, are well represented, and Scotland also is in evidence; in fact, the exhibition shows that all over Great Britain considerable activity has been displayed in the manufacture of acetylene appliances, and the capital which has been invested in connexion with acetylene already amounts to several millions of pounds in this country alone.

Cyclists will be interested in the exhibition of acetylene cycle lamps, and the solitary acetylene motor bicycle which, however, is unfortunately not one of the working exhibits.

The exhibition is well worth a visit, and architects and builders especially will do well to avail themselves of the opportunity of seeing the plant and appliances used for lighting residences and public buildings with an illuminant which is rapidly gaining in popularity, and is particularly suitable for the lighting of country mansions. The exhibition is open daily from 11 a.m. to 1 p.m. free, and from 1 p.m. until 11 p.m. the entrance fee is 1s. On Wednesdays it is only open to Fellows of the Institute. The exhibition will be open until August 31.

NEW CLOCK, UPPINGHAM.—A large clock with quarter chimas has just been erected in the parish church of Uppingham, by Messrs. John Smith & Sons, of Derby.

THE ROYAL ARCHITECTURAL MUSEUM AND WESTMINSTER SCHOOL OF ART.

The annual general meeting of the Royal Architectural Museum and Westminster School of Art was held on Friday last week at No. 18, Tufton-street, Dean's Yard, the Duke of Westminster, President, occupying the chair.

The minutes of the last meeting having been read and confirmed, the President and Vice-Presidents were re-elected on the motion of Sir A. Blomfield, seconded by Mr. J. H. Pollen.

The Chairman, in thanking the meeting for his re-election, said he considered it an honour to do anything in his power to second the efforts of the Committee in keeping up the reputation of the Museum and School of Art as a whole. He had little doubt that the recent addition to the accommodation of the school, and the consequent opportunities for the development of its work would increase its popularity and fame as one of the most successful centres of art teaching to be found in the United Kingdom.

The Curator, Mr. Francis Ford, then read the annual report, the principal parts of which we give herewith:—

"The Council of the Royal Architectural Museum and Westminster School of Art, in presenting their report for the year 1897, desire in the first place to record with deep regret the loss the Museum has sustained by the death of three of the oldest subscribers—Sir Frederick Leighton, Bart., President of the Royal Academy; Mr. J. L. Pearson, R.A., F.S.A.; and, more recently, Sir Thomas Dyke Acland, Bart. The earnest and enthusiastic band of men, who, in their love for Gothic architecture in its best and purest forms, founded and maintained the Museum in its earlier years, is indeed fast diminishing, and at present there is no sign of the ranks being filled up either by members of the architectural profession or by the general public. The Council, however, are confident that the superb collection of examples committed to their charge, and preserved intact for nearly half a century, will in course of time meet with renewed appreciation and pecuniary support, especially from those to whom its excellence more particularly appeals.

The year has been a notable one in the history of the institution, inasmuch as it has been found possible to make, at a very considerable outlay, a most useful and substantial addition to the accommodation required for the Westminster School of Art, and incidentally to free the central hall of the Museum from studies which were to some extent out of harmony with its surroundings.

The buildings referred to in the last Annual Report have been completed and partially occupied, and are now being equipped and fitted with the electric light. Four commodious class-rooms have thus been added to the accommodation devoted to the school, and it is hoped that the consequent opportunities for the development of its work will increase its popularity and fame, as one of the most successful centres of art teaching, especially in its advanced stages, to be found within the limits of the United Kingdom. This was evidenced by the result of last year's examinations, for in the most advanced subject (drawing from the life), no fewer than 61 candidates were presented from this school, of whom 22 obtained second-class certificates, 20 first-class certificates, and 8 "excellent" (the highest award), there being only 2 failures! . . .

The contract for the new class-rooms, which have been built by Messrs. Lathey Bros., from the designs of Messrs. Lee & Pain, architects, was 2,327l. The building is heated by hot-water apparatus fitted by Messrs. Haden & Sons. . . . The total expenditure on the new building is brought to a total of about 2,850l.

The balance of the amount already paid (about 1,530l.) has been provided from the funds of the Museum, which have happily been able to meet this exceptional outlay, but further donations towards the balance of liabilities will be most acceptable. The favourable condition of the finances is mainly due to the success of the School of Art, which thus repays in its prosperity the expenditure necessary to its maintenance during its earlier days, when it owed its establishment and existence to the fostering care of the Museum. It is satisfactory to know that it will in the coming autumn resume its operations with a fair prospect of a long career of increased usefulness and success."

Mr. Aston Webb proposed, and Mr. J. P. Seddon seconded, the adoption of the report. This having been agreed to, the Council, hon. treasurer, and auditors were re-elected on the motion of Mr. C. F. Hayward, seconded by Mr. S. W. Lee.

The Chairman having responded to a vote of thanks proposed by Mr. W. Paine, the meeting terminated.

MEMORIAL WINDOWS, ILKLEY.—The Bishop of Richmond recently dedicated two stained-glass windows which have been placed in Ilkley church by Messrs. James Powell & Son, of Whitefriars, London.

THE LUXFER PRISMS.

THIS is the name given to a system of glazing which has been patented in this country by the "Luxfer Prism Company," the American company whence the invention comes having their head office at The Rookery, Chicago. The system also includes patents with regard to pavement or floor lights. The floor or pavement lights are somewhat of the same nature as those our readers are familiar with in this country, with, of course, some special improvements claimed by the new company. It is mainly to bring to the attention of our readers the new method of glazing upright sashes that this notice is written, as also a new system which is adopted in fixing the squares of glass.

The company have a warehouse in Hill-street, Finsbury, which is divided into several portions on the ground floor, one of which has two windows facing Hill-street, each glazed with one square of plate glass. This room is narrow and of considerable depth, and when standing at the end furthest from the window, the place is gloomy, to say the least of it. Casement sashes are fitted to the window inside the plate glass, these casements being glazed with Luxfer prisms; when these are closed in front of the ordinary glass the place is very considerably lighter, so much so that we were able to read the advertisements of the company when standing at the end of the room furthest from the window, and this on a very dull, wet day. The matter is easily explained by recollecting that the angle of the prisms or serrated face of the glass on the inside is arranged so that the rays of light shall be refracted in straight lines towards the furthest end of the room.

Some may be of opinion that shadows will be thrown the whole length of the room, by any solid objects therein, and to some extent this will be the case, and we can only advise those of our readers who require more light to examine the invention and judge of its merits for themselves. Canopies or reflectors, so called (a more accurate name would be refractors) for fixing outside windows are also made.

The method of glazing adopted is ingenious, and is as follows:—The squares of glass are accurately ground, so that they shall be exactly 4 in. each way, the desired number are then laid out on a bench and an external frame of very light L copper fitted round the margin; each square is laid in position, having strips of copper about $\frac{1}{2}$ of an inch thick between. When the whole area is made up in this manner a few of the angles have a drop of solder put on, and the slab is lifted up and placed vertically in an electric bath composed of copper in solution, copper wires being hung from rods which form one of the poles of a dynamo machine, and the slab hung from rods forming the other pole. The machine, which is of low tension (4 volts) and large output, is then started, and copper is deposited on the copper strips, which increase in size until they slightly overlap the small teeth in the face of the glass, and also any open spaces there may be between the strips and the glass. After a time the deposit is complete, and we have an area of glass firmly held together by strips of copper so narrow as not to be any practical obstruction to the light. This, of course, is only a general outline of what can be done by the process.

The company have compiled a most useful handbook for architects, giving details to scale of various methods of constructing "canopies," &c., in iron, and full instructions as to the best prisms to use under varying circumstances.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

AN Eastern Counties' District meeting of this Association was held at Norwich and Great Yarmouth on Friday and Saturday last week. The members met at Norwich in the Council-chamber at the Guildhall on Friday afternoon, the Mayor (Mr. C. C. Rix Spelman) taking the chair at the commencement of the proceedings. Among those present were Messrs. A. E. Collins, Borough Surveyor, J. T. Eayrs (Birmingham), J. W. Cockrill (Great Yarmouth), E. J. Silcock (King's Lynn), R. M. Gloyne (Eastbourne), J. Lobley (Hanley), E. G. Mawbey (Leicester), J. Price (Birmingham), N. Scorgie (Rotherhithe), A. D. Greatorex (West Bromwich), J. Parker (Nottingham), J. S.

Pickering (Nuneaton), E. Buckham (Ipswich), J. Mann (Sevenoaks), J. P. Barber (Islington), L. P. Marshall (Resident Engineer, Norwich Sewage works), O. E. Winter, W. H. Leete, and others.

The Mayor having welcomed the members, Mr. J. T. Eayrs, Past President, took the chair, and apologised for the absence of the President, Sir A. Binnie. In the course of his remarks he said that in the past the death-rate of Norwich had been rather high, and from its ancient character there was, no doubt, a great deal of sanitary work to be done. He desired to move a vote of thanks to the Mayor and Corporation for their hospitality.

This having been carried, and the Mayor having replied,

Mr. A. E. Collins then read a paper dealing with some of the municipal works of the city, in the course of which he said:—

"During the past few years considerable lengths of ancient sewers had been put out of use. Generally they were built with walls and flat bottoms constructed of flint in lime mortar, and covered with brick arches. Some fifty years since extensive sewerage works were constructed, the sewers discharging into the river, with the result that the river got exceedingly foul. A main outfall sewer, with branches, was constructed some thirty years since to intercept the old sewers, and deliver the sewage to a main outfall sewage pumping station, constructed at the same time, at Trowse. From this powerful beam pumping engines at the sewage farm having total area of 503 acres, 268 of which are available to receive sewage. The land is irrigated with raw sewage, no precipitation, filtration or other process being used. The farm is satisfactorily let. When the main outfall sewer was brought into use thirty years since, it was found to be so leaky as to make it practically impossible for the three powerful beam pumping engines at the outfall to keep the sewer pumped down. Had iron construction been adopted at that time, the new scheme now in progress would not have been required, excepting as regards the newer parts of the city. The Corporation consulted the best engineering talent of that day, with the result that the most leaky portions of the sewer were lined with iron. Whilst the lining itself was watertight, the total amount of leakage was not materially decreased by it, as when the water was dammed out at one place it found its way in at others, more especially at the junctions of iron linings with the unlined brickwork, and whilst many devices were tried to overcome this, none were successful. As the ultimate result the then City Engineer (Mr. P. P. Marshall, who took office after these difficulties had arisen) advised—1. The construction of a new main outfall sewer at a higher level than the old one, and the abandonment of the old one. 2. The adoption of the Shone system for raising the sewage of the low-level districts into the new main outfall sewer. 3. The drainage of the whole of the city on the separate system. The undertaking contemplated being of a very extensive character, the Corporation obtained its act of 1888, giving them powers to do the necessary works, including the construction of air mains beneath the streets, and borrowing powers to the extent of 80,000*l.* The works were then put in hand under Mr. Marshall's direction, and carried on by him until his resignation of office; they were continued by the late Mr. Buchan until his resignation, and since by the author. Throughout, Messrs. Shone & Ault have been the Consulting Engineers as regards the ejectors, air and sealed mains and air compressors, which have cost about 25,000*l.* out of a total expenditure, which at completion will reach about 164,000*l.* Until about two and a half years since the works were carried on by men in the direct employ of the Corporation; since then contracting has been resorted to, excepting in the cases of certain difficult works where the amounts contractors would of necessity have to charge to cover risks would be large. In these cases the works have been done by the Corporation staff. The contractors have been Messrs. Hughes & Lancaster, of Westminster, for the ejector stations, air and sealed mains, and air compressing machinery; Messrs. Monk & Newell, of Liverpool, for the sewers in the western low-level district; and Messrs. B. Cooke & Co., of London, for one high-level and four low-level districts.

The new main outfall sewer is constructed of circular concrete pipes surrounded with cement concrete, commencing with an internal diameter of 4 ft. 6 in. At the outfall its invert is 5 ft. below the line of saturation. Otherwise, excepting in the case of pipes across the river, the whole of the sewage sewers are constructed of circular stone-ware pipes, which are jointed on Parker and Hassall's system beneath or near the line of saturation, and in all places where special care is required. This joint was adopted after trials of various systems of joints, including one devised by the author at the suggestion of Mr. Ault. Leaks are easily located before the pipes are covered, by filling the pipes with air under pressure, and painting all the joints, &c., with soapy water, when the most minute leaks will reveal themselves by the formation of bubbles. The sealed mains con-

sist in almost all cases of cast iron, socketed, lead-jointed, pipes. They are for the purpose of conveying sewage from the high levels on one side of the valley, through which the river runs, to the new outfall sewer on the other side of the valley; they also receive the pumpage from the ejectors. Each of these sealed mains forms an inverted syphon, dipping, in the case of the 24-in. pipe crossing the Wensum at Fye Bridge, to the extent of 16.75 ft. below the hydraulic gradient, and, in the case of the 12-in. pipe at Carrow Bridge, 14 ft. below the hydraulic gradient. To ensure cleansing localities, through these deeply inverted syphons almost the whole of the sewage passing through them is delivered in concentrated fushes, that from the high levels by the aid of automatic flush tanks, that from the low levels by the ejectors. Two of these inverted syphons have been at work for several months without any trouble arising, except as regards the sufficient ventilation of the pipes between the water level when not discharging and the flush tank or ejector inlets. What he considered sufficient ventilation was provided by the author, but he had to materially increase it before obtaining a satisfactory discharge from the automatic flush tank or ejector as the case may be.

For the construction of the sewers across the river at five points, comprising nine actual pipe crossings, various methods were adopted as circumstances dictated. At Carrow Bridge, where the river is crossed by a 12-in. sealed main, a 7-in. low-level gravitating sewer and a 3-in. air main, advantage was taken of the old low-level branch sewer, 30 in. in diameter, to receive the three new pipes. The old sewer was too small to admit of the joining of pipes within it; moreover it was not straight, either horizontally nor vertically. The work was done as follows:—A trench about 12 ft. long was sunk down to the old sewer on one bank of the river, and a working shaft about 7 ft. square on the other bank, and the arch of the sewer removed at each end. The pipes were lowered into the trench and jointed at the bottom. The whole of the pipes were steel, lap-welded; the joints of the 12-in. and 7-in. pipes were spherical, the sockets being of steel bored to spherical shape, the male ends were faced, turned to a narrow chamfer at the extreme end, and provided with three grooves to hold the jointing lead. Two pipes having been put in position for jointing and tightly forced together with a screw jack, the joint was run with lead, and caulked tightly between the outside of the cylindrical male end and the inside of the spherical socket. The joints of the 3-in. steel air mains used at this point were made with ordinary screwed sockets, with back nuts and gaskets at each end of each socket to ensure air-tightness. The joints having been made on a section, and the pipes bundled together in fagot fashion, they were drawn into the old 30-in. iron sewer beneath the river by means of a chain attached to the shoreward end of the pipes, and passing from thence through the 30 in. pipe to a crab fixed at the bottom of the working shaft at the opposite side of the river. The bundle pipes having been drawn a pipe length into the old 30-in. pipe, the cycle of operations was repeated until the three pipe lines were completely laid across the river. After this the pipes were tested, when it was found that, notwithstanding the fact that at one half of the joints flexure had occurred in at least three directions after the joints had been made, and that at all the joints some flexure had taken place, all of the joints were quite free from leakage and the pipes through out water or air-tight, as the case might be. At times the force required to move the pipes was so great that an hydraulic jack was required to push whilst the crab pulled. At Foundry Bridge advantage was taken of the existence of the old low-level sewer crossing, which consisted of an iron pipe 6 ft. internal diameter. The size available made constructional work comparatively straightforward at this point. At Fye Bridge a 24-in. sealed main inclining from north to south, and a 9-in. gravitating sewage sewer from south to north, had to be constructed beneath the bridge and below the navigation depth of the river. This work had to be done without stopping the bridge for traffic or the river for navigation excepting during a limited number of hours, and was effected as follows:—Steel pipes 30 ft. long (the span of the bridge being 33 ft.) were obtained; at both ends of this pair of pipes wooden yoke pieces were attached in such a manner as to secure the pipes in their proper relative positions to each other; the joints between the yoke pieces and the pipes were caulked so as to be watertight, the sides of the yokes were grooved to receive the shoeing planks of a coffer dam, and to their tops doors were hinged; such doors afterwards formed parts of the coffer dams. The pipes having been prepared in this manner, they were floated upon a pontoon beneath the bridge and slung from the bridge, by means of proper tackle, above a trench which had previously been dredged to receive them. The pontoon was then floated away and the pipes lowered on to the dredged bed. Up to this time the doors above mentioned were lying horizontally upon the pipes, this being necessitated by the limited head-room beneath the bridge. When the pipes had been lowered the doors were raised to the vertical position, the position of the pipes accurately adjusted by the aid of marks previously placed upon the doors, and the pipes

covered with concrete. Coffer dams were then driven in continuation of the small portions of such dams formed by the doors and yokes. The driving of the piles had to be effected to a great extent by means of hydraulic jacks which abutted against the underside of the bridge. Shafts were then sunk at the landward end of both abutments, and headings driven beneath the abutments into the coffer dams. This work had to be carried out at such a depth as to be in parts below the points of the piles supporting the bridge abutments. A manhole was built at each end of the river length; through these manholes the pipes are carried in special castings provided with large access doors to enable blockages to be dealt with should they occur. Blow-outs and stop-valves are also arranged on the up-stream side of each of the deepest dips to enable the pipes to be to a great extent emptied without pumping. These precautions were taken with the whole of the sewer system excepting that from No. 5 collector near New Mills, where the dip is comparatively slight. Along many miles of route both surface water and sewage sewers have had to be provided, the old combined sewers being from one cause or another unsuitable for retention as surface water sewers. Through nearly the whole of the length the sewage sewers are required to be much deeper than the surface water sewers; the former are invariably constructed of pipes, and the latter partly of pipes, but to a great extent of brickwork in cement. In all cases the trenches are excavated in such a way as to accommodate both sewers in one trench, the trenches being got out wide enough for both sewers to the depths necessary; for the shallower sewer a benching is then left, and a narrower trench carried down for the deeper sewer. In consequence of the nature of the soil and the precautions taken, no disturbance or settlement of the line of saturation has occurred, excepting in one short length, notwithstanding the fact that the deep trench is not refilled with concrete, but only with selected excavated material. The special precautions have been to select the most suitable excavated material for refilling purposes, to have it well rammed, and where the work is in the line of saturation (as it mostly is) to allow the water to rise before commencing to fill the shallower sewer. Where the work is being carried out above the line of saturation a plentiful supply of water is used to assist consolidation. It was in consequence of a neglect of this precaution that the only disturbance of one of the shallower sewers above referred to occurred. The difficulties arising from the attempt to carry out the separate system in this ancient and irregularly built city were found to be so great, and likely to lead to such an enormous outlay, that the author soon after this appointment advised that, excepting in the low-level districts drained by means of ejectors, and in new buildings and new building estates, the separate system be not proceeded with for the time being, but that the then existing combined sewers be intercepted at suitable points in such a manner that sewage and storm water up to a sufficient dilution should pass into the sewage sewerage system, and after the pre-arranged amount of dilution had been exceeded the whole flow should pass to the river, which, where any of the storm overflows exist, is tidal, and below the New Mills weir, which in its turn is some distance below any waterworks intake. The Council accepted this proposition, and since that time the work has proceeded on the lines recommended. Whilst the author upholds the separate system of sewerage as the best one extant, yet the complications and expenses are so great in cases similar to that he is dealing with in Norwich that he feels he is perfectly justified in the departure from it he has made. For the drainage of the districts lying below the levels commanded by the new main outfall sewer, six ejector stations have been constructed, each containing a pair of Shone's ejectors, manufactured by Messrs. Hughes & Lancaster. The pair of ejectors at station No. 5, near New Mills, are the largest yet constructed, and are notable as being double inlet and outlet pipes and valves to facilitate filling and discharging.

The author then described the ejectors. In speaking of the two Horsfall refuse furnaces, which have been constructed within an old building already provided with a chimney roof it high, he said they are the best of the kind in the power-houses. Tests of the furnaces and boilers have been made, when it has been found that the two furnaces, each having a grate bar area of 5 ft. 6 in. by 5 ft., are capable of burning about 90 cubic yards, or 30 tons, of refuse per twenty-four hours, and of evaporating water at the rate of 2,400 lb. per hour, at a pressure of 125 lb.

The old-fashioned small sluices which formerly existed at New Mills caused river floods to be greater than they should have been, due to a great extent to the tendency they had to become blocked with debris brought down by the river. In constructing the new works advantage has been taken of the late Mr. Stoney's invention, and a sluice on his principle, 14 ft. 3 in. wide by 8 ft. deep, has been provided. This sluice was supplied by Messrs. Ransomes & Rapier, of Ipswich; it can be raised or lowered with the full head of water against it by one man.

Mr. Collins then gave a detailed account of the engines at Trowse main outfall, after which he said

that in addition to the sewerage works, now approaching completion, the Norwich Corporation have carried out a variety of other works during the author's tenure of office. The stonework of the exterior of the Free Library had become much decayed by decay—so much so, in fact, that the mouldings, &c., were to a great extent unrecognisable. The cost of restoring the work in stone was found to be so great that a contract was entered into with Messrs. A. Dreifus & Co., of London, to cut away the whole of the decayed portions of the stonework, and to make good the whole of the work to the original features, with Tabary's Patent Metallic Stone Cement or Imperishable Artificial Stone. This work was done by French workmen, the contractor having, he informed the author, failed in his attempts to get English workmen to learn the necessary operations. At the same time, such of the old stonework as had not crumbled away was coated with Sazerley stone liquid. Notwithstanding that the work has been subjected to some sharp, if short, frosts since then, no defect of any sort has shown itself, whereas previously, scarcely a week passed without flakes or larger pieces of stone falling from the building. Adjoining the free library is the former palace of the Dukes of Norfolk, used in recent years as a museum, and now converted, as to part, into public slipper and stand-up wash baths, and as to the remainder, into offices, &c., for the guardians. The stand-up wash baths have been adopted with the view of enabling the Corporation to give a warm bath with cold shower for 1d. A technical institute is now being built near St. Andrew's Hall; the total cost is estimated at 22,000l. The contract for the buildings has recently been let to Mr. Samuel Warburton, of Manchester.

The Chairman, in moving a vote of thanks to Mr. Collins for his paper, said that some of the methods employed by the City Engineer in dealing with underground water were specially worthy of consideration. He suggested that a discussion on the paper should be conducted by correspondence with Mr. Collins.

Mr. Mawbey seconded the vote of thanks, which was agreed to unanimously.

On the motion of the Chairman, a vote of thanks was then accorded to the Mayor and Corporation for the use of the Guildhall.

The members then visited various works of interest in the City. The first visit was to St. Andrew's Hall, where a pneumatic painting machine was seen in use. The party then drove to the New Mills Air-compressing station, where are two "Victor" turbines driven by a fall in the river Wensum; two pairs of compound engines and four air compressors, so arranged as to provide alternative means of compressing air for use in connexion with the Shone system. Electricity is supplied from a Babcock-Wilson boiler, heated with refuse burnt in the Horsfall furnaces. In a marquee adjoining, refreshments were provided by Messrs. B. Cooke & Co., the contractors. A visit was then paid to the Carrow Works, by permission of Messrs. J. & J. Colman, where the machinery for making tins and boxes for mustard, &c., was inspected. The members were then driven to the Trowse main outfall sewerage pumping station, and afterwards to the Castle Museum, where Mr. Collins described some of the objects of interest.

A dinner was held at the Maid's Hotel, in the evening. Mr. Eayrs presiding, supported by about sixty members of the Association.

The loyal toasts having been honoured, the Chairman proposed "The Health of Mr. A. E. Collins," remarking that the work that gentleman was carrying out at Norwich was of exceptional quality, and was being conducted under exceptional difficulties.

Mr. Collins replied, and then gave the toast of "Messrs. Shone and Ault," and Mr. Shone responded.

Mr. Barber proposed "The Health of the Visitors," and coupled with it the name of Mr. Holmes, the Chairman of the Sewerage Committee of the Norwich Corporation, and Mr. Bassett Hopkins (London).

Mr. Holmes, in responding, said he had not the slightest doubt that the Shone system was the one best adapted to the needs of Norwich.

Mr. Hopkins also responded.

On Saturday morning the members proceeded by steamer (provided by Messrs. Collins & Cockrill) to Brundall, where train was taken to Yarmouth. The party assembled at 12.30 p.m., in the Town Hall, where light refreshments were provided by the Mayor.

Mr. Frank Burton (Chairman of the Sanitary Committee), who, in the absence of the Mayor, presided at the outset of the subsequent proceedings, welcomed the members to Yarmouth.

Mr. Eayrs then took the chair, and moved

that their thanks be accorded to the Mayor for his hospitality.

Mr. Barber seconded the vote of thanks, which was agreed to.

The Hon. District Secretary (Mr. Cockrill) then read the minutes of the last Eastern Counties District meeting at Bury St. Edmunds, and on the motion of Mr. A. E. Collins, seconded by Mr. Silcock, Mr. Cockrill was re-elected as District Secretary.

Mr. Cockrill then read a paper entitled "Some of the Recent Works carried out by the Great Yarmouth Town Council," from which we make the following extracts:—

The work of relaying the whole system of sewers has stood well, and out of nearly 100 miles of sewer under his charge there was not one mile but which was absolutely self-cleaning. Since 1886 many extensions had been made to the sewerage works. New pumping-stations on the main sewer outfalls, to prevent the tide-locking of the sewers, have been erected, and flood-prevention works have been carried out, the cost of which in the aggregate has been about 25,000l. These works comprise about one mile of 5 ft. egg-shaped and 1½ mile of 3 ft. egg-shaped sewer, built in concrete with a salt-glazed tile facing—the cost was remarkably low. The 5 ft. sewer cost 33s. per yard run, and the 3 ft. sewer 20s. per yard run without digging. The low cost is due to the very great facilities for making concrete at Yarmouth, the clean shingle being delivered on the works, ready for use, at 1s. 3d. per yard cube. The success of the sea-water works, described in a previous paper, on all points was so marked that the committee determined very soon to extend the works, and instead of the 4,500l., which the original works cost, more than 10,000l. has now been spent. The cost, including repayments of capital, interest, and all working expenses, has been about 600l. per annum during the last few years since the extensions, and for this quite 100 million gallons of water has been raised to a height of 45 ft. and distributed over the town, or at a cost of 10s. 6d. to 1½d. per 1,000 gallons. The street watering takes about 7 million gallons, and sewer flushing the remainder. The water is supplied free to most of the elementary and board schools in the town for flushing closets, urinals drains, &c., some fourteen houses also have it laid on for baths and drain flushing. Flushing is carried out by some twenty-five automatic flushing-tanks, varying in capacity from 3,000 gallons to 1,000 gallons, and with outfalls of from 9 in. to 15 in. diameter, besides about 250 flushing-valves, varying from 6 in. to 3 in. diameter, according to the size of the sewer to be flushed; but he had found that 3-in. and 4-in. pipes with delivery direct into the sewers provide sufficient flush for 9-in. pipes, and that sewers up to 15 in. diameter can be kept clean with the larger-sized valves. The save in the roadwork is very considerable; the sea water has a most beneficial effect on light roads made with gravel or flint. No damage is done on the heavier granite macadam, but a greater amount of cleaning is required in the autumn. The saving on the light roads by the use of sea water, in his opinion, is quite 500l. per annum, spread over about twenty-five miles. In addition to the saving caused by the water costing only 1½d. per 1,000 gallons instead of 1s., there is from two to three million gallons less used than there would be if fresh water were employed. The save in horse hire in distributing is quite 250l. per annum, and the work is much more effectually done. Its use has been most effectual in preventing nuisances from sewer-gas, as not only is there the mechanical action of the flush, which scours the sewers out, but there is the change of air in the sewers caused by the large rush of water. In the sewerage of the Old Rows, of which there are 145, averaging about 150 yards in length and less than two yards wide, which have been recently sewered, each sewer has its own flushing valve at its head, and is by this means kept perfectly clean. The length of water mains laid in the streets is now thirteen miles, of sizes varying from 8 in. to 3 in. diameter.

During the sixteen years which the author has been responsible, he has laid some forty to fifty miles of concrete footways. The facilities for obtaining materials are very great, and shingle ready for the work, entirely free of sand, is delivered in the streets at 1s. 3d. and 1s. 6d. per yard cube. This permits the path, 3 in. thick, to be laid at a cost of 2s. to 2s. 2d. per yard superficial by the Corporation staffs. Contracts, however, have been let and completed at from 1s. 8d. to 1s. 9d. per yard superficial.

The growing difficulty of disposing of town rubbish has for some years been apparent in the town, and although recreation and pleasure grounds have been formed with this material during the last ten years—for he had laid down thirty-two acres of this class of ground on sandy waste land similar to and partly on the beach—the cost and upkeep of the grounds prevents too great an extension, and the Town Council have reached a point beyond which they could not go at present. It thus became necessary to decide on some other course, and it was ultimately determined to erect a destructor. The foundations of the site are very bad; the river Bure adjoins it on the west, and the mean level of the water in the same

is above the level of the marsh; the soil is for the first foot or two vegetable mould, then there is about 2 ft. of sand which is full of water, and then for nearly 20 ft. a soft alluvial deposit, locally known as ooze. The utmost bearing capabilities of the soil about 6 in. from the top after removing the sod, was by experiment found to be 10 cwt. per foot superficial; the bearing capabilities of the ooze not being more than half this. At a depth of 22 ft. is found a bed of good sand and gravel, and borings on the site show this to be at least 15 ft. thick. The very poor quality of the refuse of the town, which contains a large percentage of sand, with the contents of some 3,000 privies, will give poor calorific results; and the present installation only provides for fixing an 80-h.p. boiler, the steam from which will be used for fans, for forced draught, a dynamo from which light will be obtained for the works, and motors for sewerage lifting at a station near by. The chimney is to be 200 ft. high; it starts square at the base, is octagonal for 50 ft., and then goes up circular; inside it is a parallel tube 6 ft. in diameter, with fire-brick lining the whole height, and kept at least 4 in. from the outside shaft; for half its height it is 14 in. thick, and for the remainder 9 in. thick. The foundations which are now in progress for the chimney and main buildings are to be on cylinders. The chimney weighs 2,300 tons, is to stand on sixteen cylinders, each 6 ft. 6 in. diameter, and gives a weight, including the cylinder, of 4 tons 6½ cwt. per foot superficial on the bed of sand and gravel. The main building is to stand on twenty-six cylinders of 5 ft. 6 in. diameter, and give an average of about 3 tons 5 cwt. per foot superficial on the soil. The cylinders are constructed of concrete blocks 9 in. thick, built in the ordinary way.

Mr. Cockrill then referred to the Depot, and the Isolation Hospital accommodation. The success of the Isolation Hospital for fever cases and the good work done by it led the Council very soon to make additions to it, as laid out in his first plan. The extensions now being made consist of eight bedrooms to the administrative block, a large double ward block of the usual plan, and, what is perhaps a rather unusual feature, a convalescent block for scarlet fever patients; this consists of a day room, two dormitories, two nurses' rooms, bath room and usual offices. The whole of the ward blocks are erected in concrete, the walls outside being faced with pebble panels, brick quoins and dressings, and inside with glazed tile.

An addition, 130 ft. in length, was made to the old jetty in 1890. The old portion has historic associations connected with the naval wars in the early part of the present century.

Reference having been made to the rifle butts, and accommodation for volunteer encampments, and the recreation grounds and beach gardens, he referred to the fish wharf quay wall. He recommended the Council to put in a concrete quay wall in the year 1888, and this work was completed in 1891. Messrs. Kinnipie & Jaffery, of Westminster, were consulting engineers. The wall as designed and executed was composed of concrete blocks, the five lower courses capital, and the top two were 3 ft. 6 in. high. Each block was 3 ft. wide on the face; the top three courses were faced with granite rough dressed. The works were completed 1,000l. inside the estimate, under the author's supervision, without the intervention of a contractor. The length of the wall is 2,100 ft., and its height from foundation to coping is about 27 ft. 17 ft. of this is below low-water mark.

As early as 1886 he had been instructed to, and he had reported upon the desirability of introducing the electric light into the borough, and in 1890 the Town Council obtained a provisional order, which they commenced to carry out in 1894; Mr. W. H. Preece, C.B., F.R.S., being appointed consulting engineer. The cost of the first portion of the installation was 15,000l., but the demand for the light has been so great that at the present time the capital expended amounts to 33,000l., and leave for fresh loans is asked from the Local Government Board, which will make the capital expenditure 40,000l. The increase of the demand is shown in the fact that the lamps installed on April 1, 1895, were 1,600; in 1896, 5,900; in 1897, 8,600; and in 1898, 11,000. The arc lights in the town number sixty (with eleven at the Fish wharf, which are only used when those on the beach gardens are not alight), and are continuous current 1,500 volts, thirty lamps in series. The private lighting is high tension alternate current 2,000 volts, with some twenty transformer sub-stations. The charge made to private customers is 6d. per unit, to churches, chapels, and public elementary schools, 4d. per unit, and to motors, a sliding scale varying from 1½d. to 3½d. per unit. The whole installation has been put in by Messrs. Crompton, of Chelmsford. The mains are armoured cables made by the British Insulated Wire Company, of Prescott.

In conclusion, Mr. Cockrill referred to some works under consideration, such as the provision of a system of electric tramways (the system recommended was the overhead trolley system, and the estimate for the work, which has been deferred, was 36,000l.), and a pier and pavilions. The scheme for the pier as approved by the Committee, from his plans and designs, comprised a pier 660 ft. in length, with large T end, a landing stage 900 ft. long surrounding the T end, a large quantity of shelter accommodation, and band stand, &c. A combination of vested interests, and

he sentiment that the present old jetty was free to the public, prevented anything being done."

Some of the plans and models prepared for this and other works were on view.

Mr. Mawbey, in proposing a vote of thanks to Mr. Cockrill, said that his method of supplying salt water was a great victory, considering the cost. Their able colleague was practically the pioneer of concrete paths. In regard to the destructor, he was rather surprised that more was not to be done to utilise the waste heat, but he noticed that the refuse was of a very poor quality, and the calorific power would be very low. At Leicester, he was recommending it for use in electric traction. He believed that at least three horse-power could be produced per ton of refuse every twenty-four hours. He did not believe in rushing from ten to twenty tons a day through a destructor. The first duty was to thoroughly burn the refuse so as to avoid any nuisance in the way of escaping dust. He should like to refer to the sanitary tile which had been invented by Mr. Cockrill. It was a very good tile, and he had used it in Leicester.

Mr. Lobley seconded the vote of thanks, and said that in Hanley he was troubled as to the foundations of the destructor in consequence of undermining. He wanted to ask Mr. Cockrill if he had considered the advisability of using a steel chimney, considering the foundation he had to deal with at the site of the destructor. He (the speaker) was considering that point.

The discussion was continued by Messrs. Silcock, Baker, Nettleton, and Hayward.

Mr. Silcock, in calling attention to the extremely low cost of some of the work carried out at Yarmouth, said that it was a great advantage to have so much shingle, &c., to hand. As to the proposed destructor, Mr. Cockrill had great courage to build a chimney 200 ft. high on such a foundation, and in such an exposed position. He quite endorsed Mr. Mawbey's remarks as to the tiles invented by Mr. Cockrill; he (the speaker) had used them himself, and he knew what good work could be done with them.

The vote of thanks having been put by the Chairman, and heartily agreed to,

Mr. Cockrill briefly replied. He remarked that he had considered the question of a steel chimney for the destructor, but he had decided to use brick. He did not think, when considering the matter, he could get a loan for more than five years from the Local Government Board.

Mr. A. H. Preece then read a paper which had been prepared by his father, Mr. W. H. Preece, C.B., which was entitled, "The Abuse of Electric Power Houses." It is referred to on another page.

After a brief discussion, in which Messrs. Mawbey and Lobley took part, a vote of thanks was carried to the author of the paper and the reader, and Mr. Preece, jun., briefly replied.

A vote of thanks to the Mayor and Corporation for the use of the Town Hall having been agreed to, visits were made to the various works described by the Borough Surveyor.

The proceedings then terminated.

ARCHITECTURAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—The annual business meeting of the Glasgow Architectural Association was held in the rooms, 187, Pitt-street—the President, Mr. W. T. Conner, in the chair. The Secretary read the annual report, including the statements of the treasurer and librarian. During the session nineteen new members were admitted. The syllabus comprised nine papers and four lectures, in addition to which there were exhibitions of drawings and photographs. There have been three prizes offered for competition, of the respective values of 10l. 10s., 5l. 5s. and 2l. 2s., the first for a design, the other two for measured work and sketches. The treasurer's account shows a balance of 47l. 3s. 6d. on the credit side, and the librarian's statement enumerates valuable additions by purchase and donation. The following gentlemen were elected to hold office during the coming session:—President, Mr. G. S. Hill, A.R.I.B.A.; vice-presidents, Messrs. John Fairweather, A.R.I.B.A., and C. E. Whitelaw; hon. secretaries, Messrs. R. J. Walker and Alex. Wingate; hon. treasurer, Mr. W. S. Tucker; hon. librarian, Mr. Hugh Dale; general committee, Messrs. James Lochard, A.R.I.B.A., Wm. Vickers, Thos. Ramsay, and W. J. Blain.

COMPETITIONS.

TROWBRIDGE TECHNICAL SCHOOL.—As we stated in our last issue, there were sixty-seven competitors in this competition, and the assessor, Mr. E. W. Mountford, placed first the designs of Mr. T. Davison, A.R.I.B.A., of Great Ormond-street, W.C. The designs of Messrs. Briggs and Wolstenholme, Central Buildings, Richmond-terrace, Blackburn, were placed second; and the designs of Mr. A. Dunbar Smith, 28, Theobalds-road, Gray's Inn, W.C., and Messrs. A. G. Hall and Thos. H. Bishop, A.R.I.B.A., Leighton Buzzard, were bracketed for third place. Mr. T. E. Thickpenny, A.R.I.B.A., Breydon House, Lansdowne-road, Bournemouth, Messrs. J. H. Tyars and E. T. Jago, 16, Garfield-road, Lavender-hill, London, S.W., were highly commended.

Books.

Lichfield: The Cathedral and See. By A. B. CLIFTON. George Bell & Sons.

THIS is another volume of Messrs. Bell's little "Cathedral" series, and it well maintains the high standard of excellence reached by those that preceded it. Indeed, in two minor respects it is an improvement upon them. There is an entire absence of indifferently drawn sketch illustrations, and the ground plan is put at the end where it can easily be turned to for reference, instead of in the middle where it had to be hunted for. These admirably condensed and lucid accounts of our cathedrals are obviously the result of much careful research, which we are especially grateful to Mr. Clifton for having undertaken in the case of Lichfield; for, in the absence of much direct evidence as to the early history of the building, it has been the subject of many interesting speculations by antiquarians, whose accounts are scattered in a great variety of publications. Though the See was one of the earliest founded in the country, and originally of immense extent, including the greater part of those of Hereford, Ely, Peterborough, Chester, Worcester, Oxford, St. Albans, Gloucester, Manchester, Liverpool, and Southwell, the cathedral was from the first, and has remained through all its changes, a comparatively small building; not, indeed, so inferior in this respect as might be supposed from the way in which it is often spoken of, but still considerably under the average size of even English cathedrals. It shares with Salisbury the distinction of great regularity of plan and uniformity of style, and is the only English example which has the ideal three spires, and the only one with a polygonal eastern apse. The structure suffered even more than others in the civil wars of the seventeenth century, owing to the close, which had been fortified by an ambitious bishop in the fourteenth, being besieged by both sides in turn. It suffered again terribly at the hands of Wyatt, with his "vistas" and his stucco, and the passage, quoted in this volume from Canon Lonsdale's "Recollections," describing the state of the building before Sir Gilbert Scott began the restoration, must, one would think, convince the most conservative that there was ample excuse for some such thorough overhauling.

Lichfield Cathedral, as we see it now, is one of the most perfect and lovely of our mediæval monuments. In style, if not very spirited, it is exceptionally pure, and some of its features are unique and interesting. It is altogether worthy of a painstaking monograph, and the one under review is not unworthy of it.

Industrial Electricity. Translated and Adapted from the French of HENRY DE GRAFFIGNY, and Edited by A. G. ELLIOTT, B.Sc. London: Whitaker & Co. 1898.

This is the first of a series of volumes in electro-mechanics, which are intended to explain in simple language the many and various applications of electricity without going into abstruse theory or using mathematical symbols. As this book is introductory to the rest of the series it ranges over the whole subject, and thus the information given is necessarily very meagre, and unless one has some practical knowledge of electricity, it will merely give a very vague idea of the numerous applications which are to be treated in detail in the subsequent volumes.

On the first page of this book, in describing the constitution of matter, occurs the following

startling statement:—"We conceive matter as being composed of exceedingly small particles called atoms, arranged in groups called molecules. These molecules are not rigidly connected to one another, and even in the densest matter the intervals which separate them are vast compared with their size, and may be likened to the enormous distances which separate the stars." This is certainly a very transcendental theory. According to the ordinary theory, which is good enough for working purposes, the molecules in a liquid are touching one another, and in a solid they are fixed relatively to one another, and only a slight amount of play and vibration is possible. In a gas, according to Clerk Maxwell, a molecule collides with other molecules some eight thousand million times a second, and the mass of the molecules in a cubic inch is probably greater than the thousandth part of a cubic inch, so that even in this case the comparison seems absurd.

In the résumé of units and dimensions of electric quantities given on p. 27 there are at least twelve misprints; but as this page would probably be skipped by the class of readers for which the book is intended, this perhaps is not very serious. It is misleading to state that in the best Siemens' dynamometers currents varying from 1 to 1000 ampere can be measured, as this is a most unusual range. There are one or two other minor points we would like to criticise, but as the subjects are only touched on the misleading effect may be due to the condensation rendered necessary by considerations of space.

The volume is a convenient size, the print is clear, and the division of the matter is good. As a whole it is accurate, and promises well for the series.

Proceedings of the Thirty-first Annual Convention of the American Institute of Architects, Providence, U.S.A. E. A. JOHNSON & Co.

THE Report of the thirty-first "Convention" which we suppose means the same as "Congress" of the American Institute of Architects is a thinner volume than some of its predecessors which have been in our hands, perhaps because some subjects of special interest have already been pretty well talked out. Among the subjects discussed was that of "The Advisability of Licensing Architects," on which a Report of a Special Committee, appointed at the last Convention, was read and is given in full. The various "Chapters" of architects in different States, in relation with the central body, had been invited to express their views on the subject. We cannot go into the details, but the following is the general result as expressed in the Report:—

"It appears from the correspondence, which is voluminous, that in five of the States of the Union we have been introduced in the various legislatures looking toward the establishment of a Board of Examiners and some standard of professional skill to be required of those who are permitted to practise architecture. These bills, in all cases, so far as the correspondence indicates, have been introduced, advocated, and supported by the architects of the various States where the bills were introduced, both as organised bodies and as individual practitioners. In one State—Illinois—this law has been passed, and is now in operation, or, at least, the Board of Examiners has been duly organised, and is now ready for work.

The general consensus of opinion as expressed by the replies of all the Chapters is almost unanimously in favour of legislative enactment, restricting the practice of architecture to those who have the ability to design strong and safe buildings."

Nothing, it will be observed, is said about examination in artistic qualifications, only as to the capacity to produce "strong and safe buildings," which practically is the only basis on which legislative control could be established. This of course leaves the movement open to the objection made to it in England, that it would result in "hall-marking" to a certain class of persons as architects without any regard to their artistic qualifications.

It is important to note, however, that the majority of American architects who are represented on the central body are in favour of the movement. The volume contains a paper on "Church Architecture," by Mr. Burgess of Boston, which, as an expression of the attitude of an architect belonging to a country in which there are no ancient precedents, on a subject in which we in England are so much governed by precedent, is of considerable interest, and we may find space to print a portion of it on another occasion.

Public Works in Lancashire for the relief of distress among the unemployed factory hands during the Cotton Famine, 1863-66, carried out under the supervision of Mr. Robert Rawlinson, C.E., Chief Superintending Engineering Inspector to the Local Government Board. With an appendix on the sewerage of towns and draining of houses. London: P. S. King & Son. 1898.

THIS is a somewhat curious compilation. It consists of extracts from reports prepared by Sir Robert Rawlinson on the works "of permanent utility and sanitary improvement," which were so ably carried out under his supervision in Lancashire and adjacent counties during the Cotton Famine, together with his paper on "The sewerage of towns and draining of houses," which appeared in the "Journal of the Society of Arts" so long ago as March, 1862; his report on "Sanitary Works at Windsor Castle," dated 1863; and "official and press notices on his receiving the honour of knighthood, 1883," and "on his retirement, 1888." As a contribution to the history of practical sanitation, this compilation is not without merit; as a biography of one of our most distinguished engineers, it is very inadequate; if intended for the student of sanitary problems, the matter should have been corrected up to date. The book will be interesting to Lancastrians and to the late engineer's friends and admirers.

The "Journal" of the Sanitary Institute. London: E. Stanford and at the office of the Sanitary Institute. April, 1898.

THIS latest number of the *Journal* of the Sanitary Institute contains papers on a great many important subjects, one of the most useful being that on "Small Isolation Hospitals," by Mr. Meredith Young, going into a number of small practical details which are sometimes overlooked because they appear so small, but which are of serious consequence. Mr. James Munce contributes a paper (with plans) on "Workmen's Dwellings in Belfast"; Mr. Chas. Mason one on the "Sanitary Aspects of Wood Paving," really a defence of this method of paving, in which we do not much sympathise, though we admit that some of the objections to it may be, as the author argues, the result of an inferior system of laying and inferior material; and Professor Corfield and Miss Chreiman deal with the subject, of special interest at present, of "The Contamination of Water-supplies by Hop-Pickers."

Greenwood's Timber Calculator. Second edition. By T. HARRY GREENWOOD. Manchester: Buxendale & Co. 1898.

WE gather that this issue may be described as a second edition, though it is not so stated in the usual manner, because an addition has been made, which we suggested in noticing the publication before, in the shape of a distinct statement that the figures in the price columns represent pence and fractions of pence, which was not stated in the earlier copies. We are glad that the small publication has been found useful, as we expected it would be.

Elementary Chemistry, Practical and Theoretical, First Year's Course. By T. A. CHEETHAM. Blackie & Son. 1898.

THIS is a small book for the use of those about to commence the study of chemical science. The first portion of the book gives directions for the performance of a large number of simple experiments with inexpensive and common apparatus and reagents. The second part deals more with the laws and principles by which chemical reactions are governed. We are glad to see the word "observe" so constantly reiterated throughout the book, for in the study of science the development of the power of observation is far more important than the committing to memory of a host of facts recorded by previous experimentalists.

BOOKS RECEIVED.

SPECIFICATIONS FOR BUILDING WORKS: A Manual for Architectural Students. By F. R. FARROW, F.R.I.B.A. (Builder Office) and Whitaker & Co.)

ELECTRICITY IN TOWNS AND COUNTRY HOUSES. By Percy E. Stretton. (A. Constable & Co.)

Correspondence.

To the Editor of THE BUILDER.

TRAINING OF WORKMEN.

SIR,—In your report recently of the dinner of the Institute of Builders, Lieutenant-Colonel Trollope is reported to have said, "That employers seemed to think that complete tradesmen grew on the roadside, and took not the slightest trouble to make them." This most happily expresses the attitude for the past twenty years or so of the majority of employers in the building trades towards the question of the training of the British workman, and it is to be sincerely hoped, for the welfare of British industries, and the health of the people, that Colonel Trollope's words will be heeded.

I cannot expect to have space accorded in your columns to enter fully into the causes which have brought about the state of affairs mentioned, but I may be permitted to briefly point out how, to a great extent, it may be remedied. Broadly speaking, the death of the apprenticeship system is due to two causes. (1) The displacement of handwork by machinery, and (2) the substitution of the contractor for the builder proper. Of this latter class there are but few remaining who have practical knowledge of the details of construction. The comprehensiveness of modern building operations demands financiers at the head of affairs, the practical parts being left to departmental experts. These have no immediate concern in the production of future workmen, as the process to them is troublesome and unproductive. They drain the provinces of men, and when the supply runs short put down more machines. This will continue, sentiment notwithstanding. Machinery means sub-division of labour, and it is impossible to pass a lad from one machine or department to another continually, so that he can follow the processes that go to make up the finished article. Even so simple a thing as a door may be passed through four or five machines to complete, the final result giving no inkling to the worker as to how it has been reached; so that if it were possible to revive workshop apprenticeship it would be useless as a remedy.

Twenty-five years' experience with the old and the new workman in all branches of building has convinced me that nothing short of entire production from start to finish, by hand-work, will ensure an intelligent and capable workman; given that, he may be adapted as may seem most suitable for the production of any particular portion. If, then, the exigencies of modern industry prevent such experience, is it not reasonable to ask that some other method should be attempted to bring about the same result? My suggestion is that responsible building firms should take a sufficiency of apprentices for periods suitable to the various trades, and for such length of time as to ensure a return for the outlay to be proposed; that it be a condition in the indentures that they should attend a certain time—say four hours a day for five days a week for the first year—at a properly managed and equipped training school, there to be engaged upon, and instructed in, the construction of the usual class of work, in their respective trades, by thoroughly competent tradesmen; the remainder of their time to be put in at the works in the usual way.

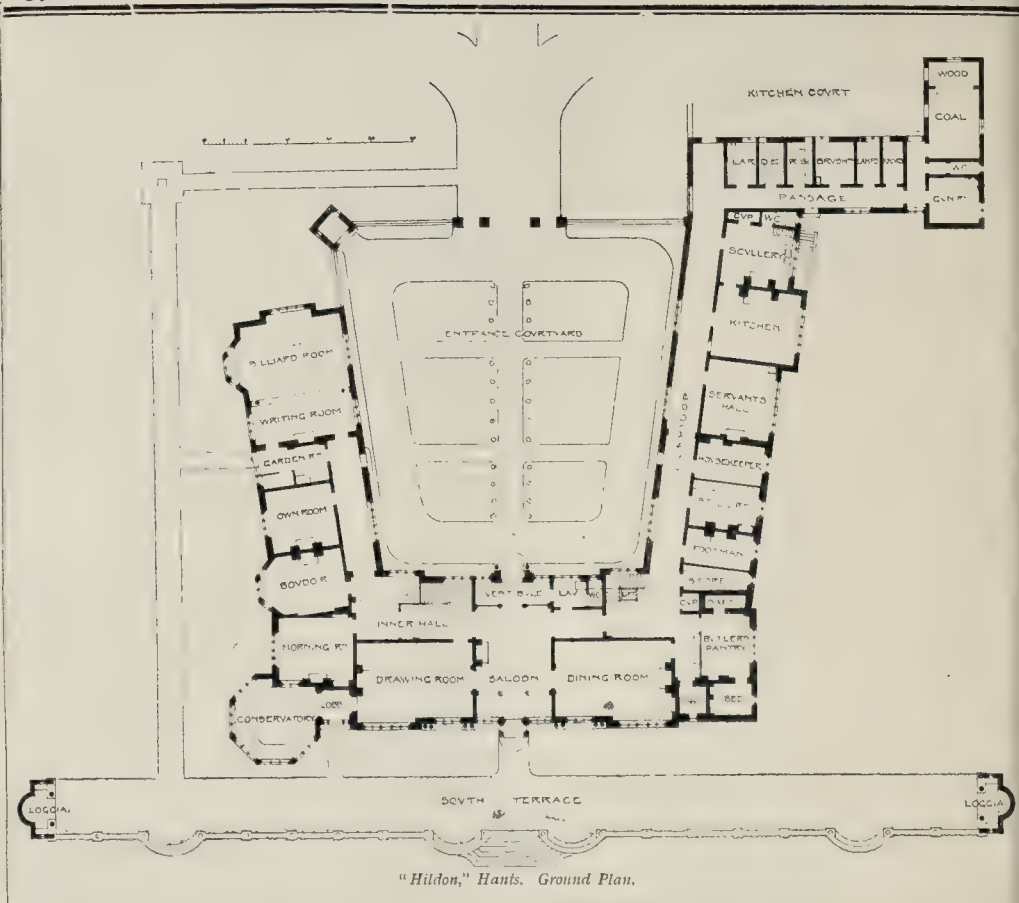
One year, as described, would, in most cases, render a lad so capable and useful that his attendance at the school might be cut down to one or two days per week for the following year, and during the remaining period of his apprenticeship he could probably gain sufficient information in the evening class, providing he was not required to work overtime.

Such training schools could be established where required, and be under the control of any representative association of builders, their cost to be met by contributions from those sending their apprentices for instruction. The details of administration could be settled at a Conference. That the difficulties are not insurmountable is proved by the establishment of such a school in the W.C. district—the Trades Training School of the Worshipful Company of Carpenters. This, although doing a good work unostentatiously, is much hampered by the apathy and indifference of builders; and any one willing to try the experiment would probably be gladly assisted by the Company.

GEO. ELLIS.

INSURANCE FOR WORKMEN.

SIR,—I am a jobbing and contracting builder, employing all branches of the trade, one-third of the men being constantly in employ, and the other two-thirds being migratory workmen; and it has occurred to me that a system of insurance might be adopted, and may be self-sustained, by each workman paying a very small amount weekly. At present, when a workman is ill, his fellow-workmen and myself help him by subscription, but this is very unsatisfactory, for obvious reasons. I shall be glad if any of your readers have a workable scheme, and would inform me of the same through the medium of your valuable paper, as there is no doubt other employers would adopt any likely idea for what is a felt want in my district. The great difficulty with me is the



fact that some of the workmen are only employed for two or three days, while others have been with me for twenty years.

ASSURANCE.

ART METAL EXHIBITION.

SIR,—With regard to your remarks that the names of artists who have designed work which we have made should have been made known, we would reply that, by an oversight of the printer, no description of our work is in the catalogue. When this is issued in its revised form you will find the names of the artists in it.

LONGDEN & CO.

PORTLAND CEMENT KILNS.

SIR,—I should feel obliged if any of your readers can inform me where there are to be seen in working order any recently-constructed chamber kilns for making Portland cement, and can supply me with any information on the subject.

R. B. S.

RED ANTS.

SIR,—May I ask the favour of inquiring if any of your numerous readers could kindly give me some information as to the best means of ridding houses infested with the small red ant? I have some houses in which they have burrowed into the earth under the floors, and from there spread over the entire house; and thinking that perhaps some of your readers or correspondents may have suffered from the same trouble, I venture to ask if they would give me some advice in the matter, for which I should be very grateful.

S. B. KING.

NEW CHURCH, CATTEDOWN, PLYMOUTH.—It is stated that the first portion of this church, consisting of entrance and a room capable of holding some 200 people, which will eventually form a portion of the west end of the proposed church, is almost complete. The west entrance has been built from the designs of Messrs. Weblin & De Boinville, of Plymouth, and Mr. A. H. Trevelyan has completed the sculpture of the scene on Calvary on the tympanum over the doorway.

Illustrations.

PROPOSED MANSION: ELEVATION AND PLANS.

THIS is a scheme, not yet entirely matured, for a house which might perhaps rather be called a State villa than a mansion. Certain special objects were kept in view in designing it; viz., to have a spacious and effective central hall and staircase on a large scale; to provide a generally symmetrical treatment of the front while at the same time facing the dining-room and drawing-room windows the opposite way, according to their requirements of aspect—the dining room facing north-east towards the entrance front, the drawing-room south-west and towards the garden; and to group the bath-rooms and water-closets in a tower separate from the main building, and reached by bridges. Thus the lower story of the tower, on the level of the billiard room floor and close to it, is set apart for the gentlemen; a mezzanine, reached by a stair from the corridor of the men-servants' sleeping rooms, provides for them; the ladies' story is above that, reached from the corridor near the State bedroom; the women servants' story is over that, and would be reached by a bridge over the same point as the men servants' bridge. A separate story can be given for extra bath-rooms. The tower is to carry a storage water tank on the top; hence the buttresses and the thick cross wall.

The entertaining rooms, hall, and conservatory are so aligned that, when desired, on the occasion of a great fête for instance, there would be a central vista of 230 ft. from the grand buffet of the dining-room to the circle of the conservatory. The spectators' gallery of the billiard room is arranged so as to be on a level with and *en suite* with the vestibule near

the garden and dining-room doors, the actual playing floor being at a lower level.

The old-fashioned manner of making the access to the entertaining rooms through one to another, without a passage, is to my mind quite in keeping with the objects and character of a State house. Similarly, on the upper floor, the two dressing-rooms are made the ante-rooms to the principal guests' bedroom. In the ordinary case of a bedroom and dressing-room arranged for married persons, the gentleman's dressing-room is of necessity an ante-room or passage to the bedroom, and there is no reason why the lady's should not be also. The provision of a second dressing-room is of course to some extent a luxury rather than a necessity, but it here serves the purpose also of a bath-room.

It was intended that all flues should be carried into the two large up-cast shafts shown on either side of the hall, but this may perhaps be still better provided for by slightly enlarging the latrines tower and carrying the exhaust flue up the centre of that.

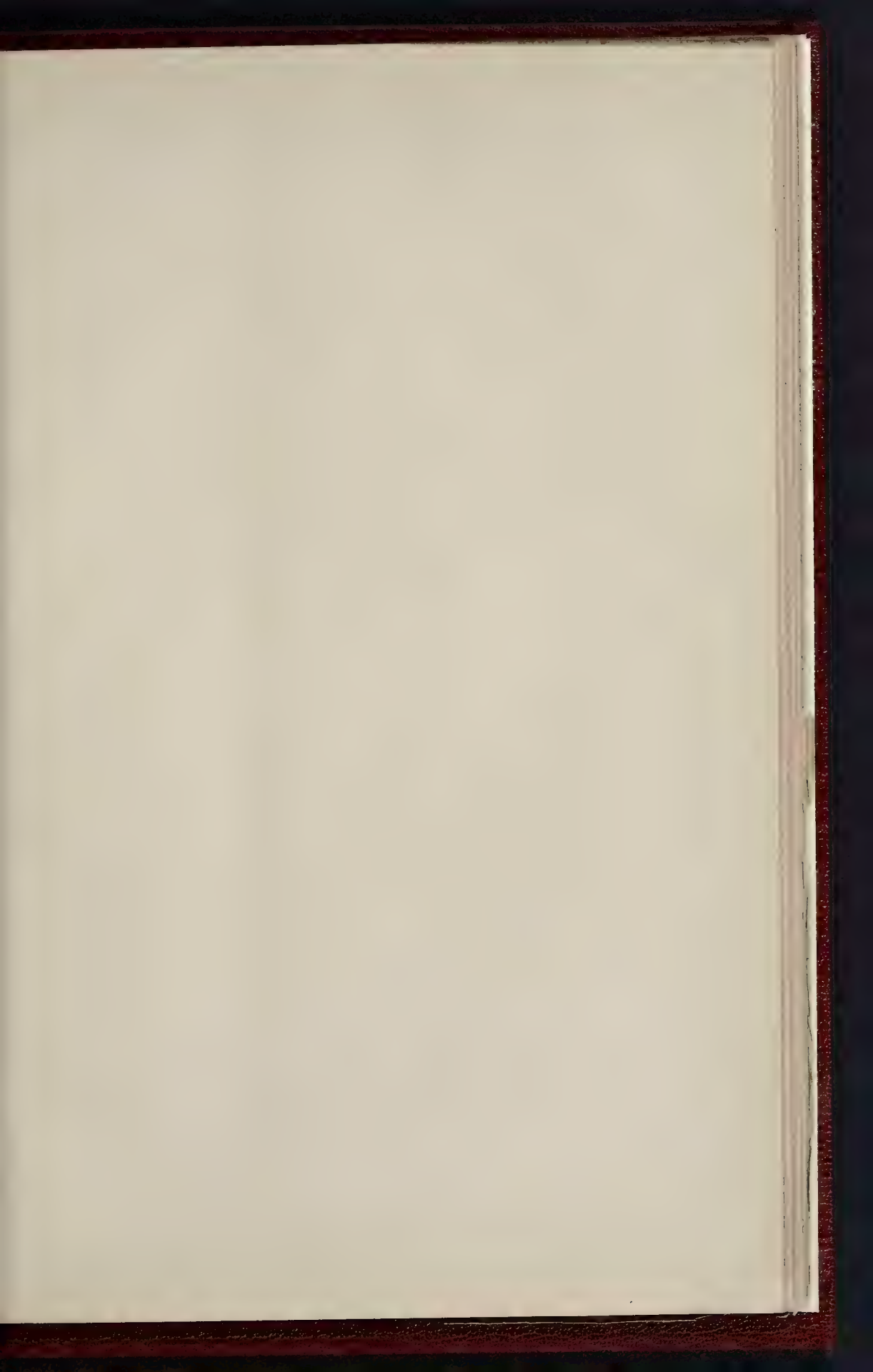
H. HEATHCOTE STATHAM.

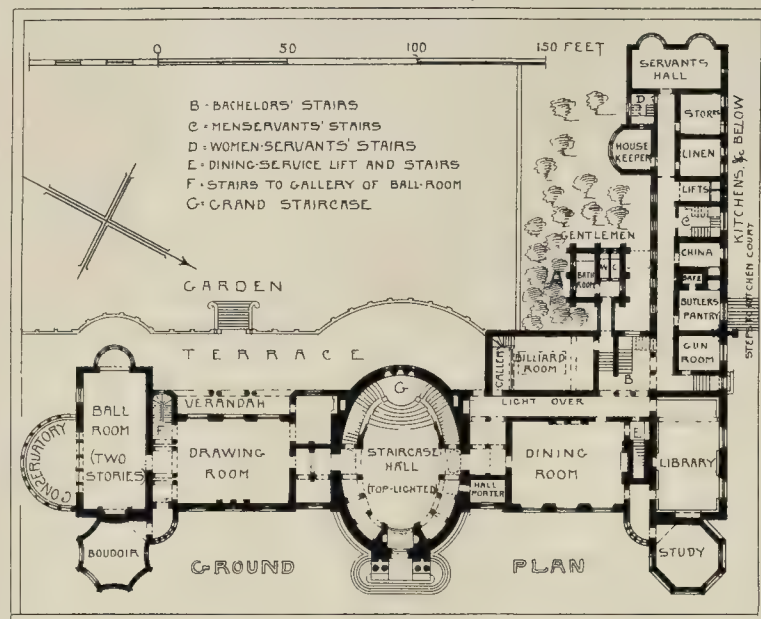
"HILDON," HANTS.

THIS house is being built by Sir Augustus Webster, Bart., on the site of a smaller house which has been pulled down to make room for it.

The house will command fine views to the south. The plan adopted has rooms on one side of a corridor only; the corridor looks into the courtyard and the rooms towards the gardens. The wings are cantled partly to increase the size of the courtyard, partly for the view and aspect, and partly to soften off the angles of the building. The plan of the ground floor is appended.

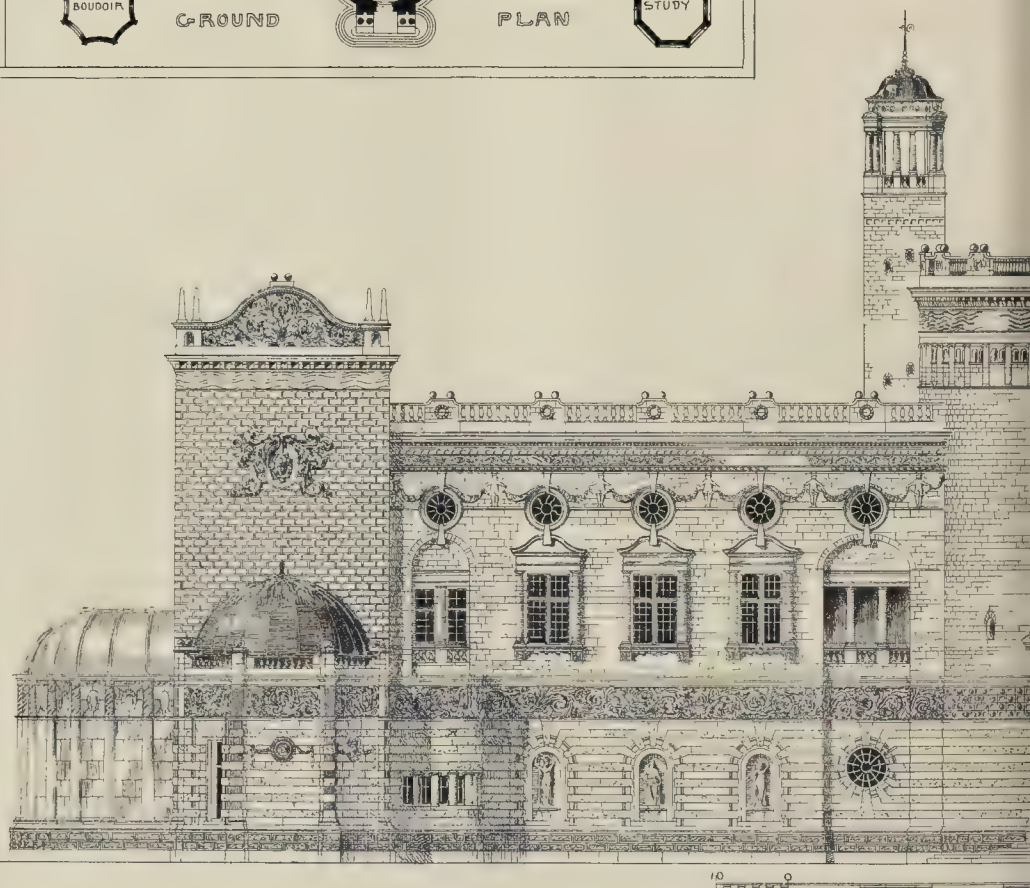
The walls are of white Suffolk bricks with Bath stone dressings, and the roofs are covered with green slates. The stables, to the north-





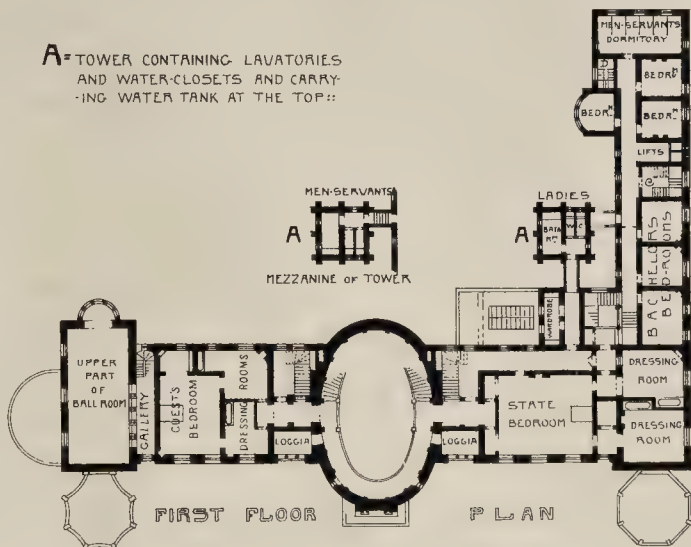
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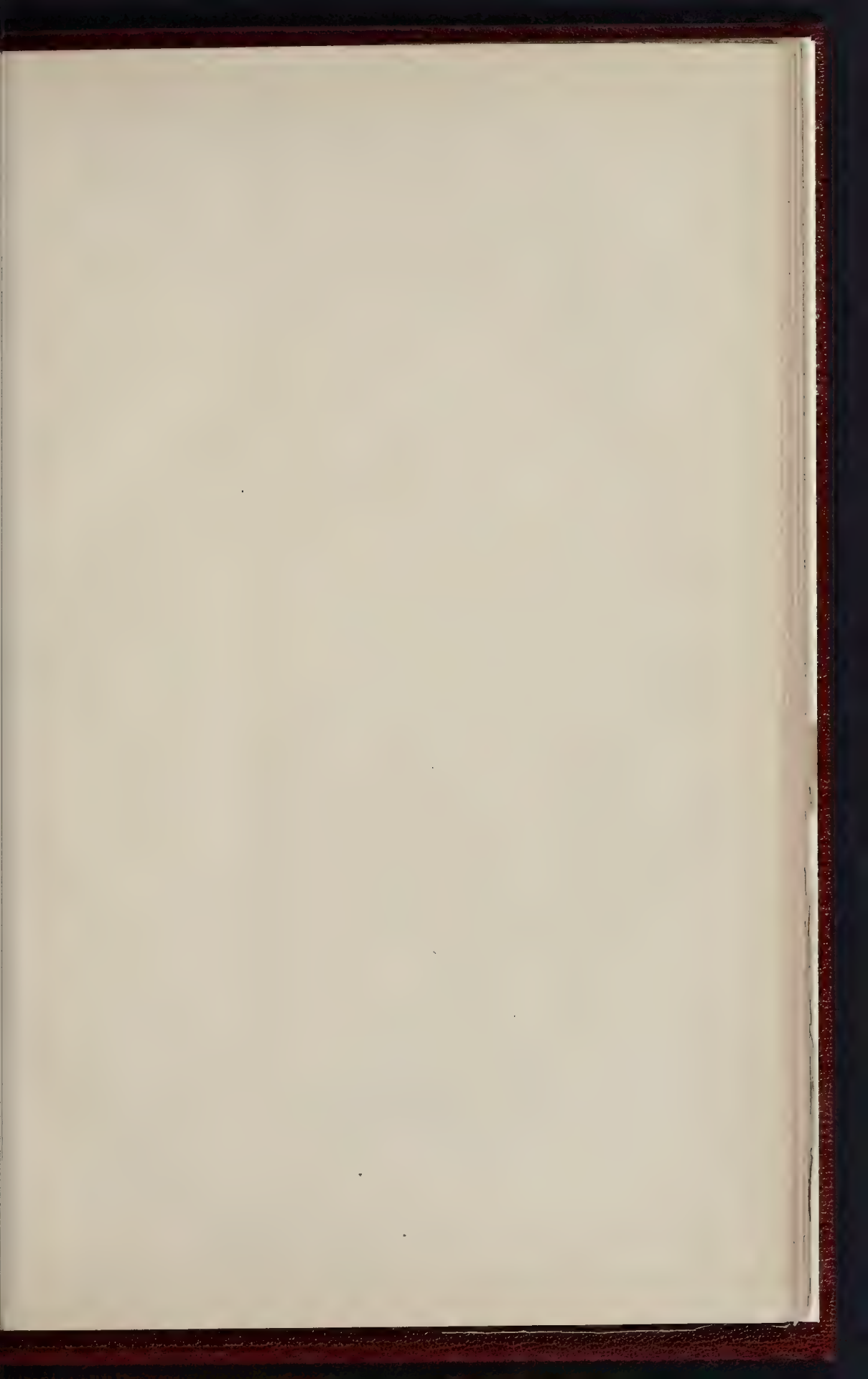
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AND WATER-CLOSETS AND CARRY-
ING WATER TANK AT THE TOP::



H. H. STATHAM INVENTOR DEL.

PHOTO BY H. SPRAGUE & CO. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

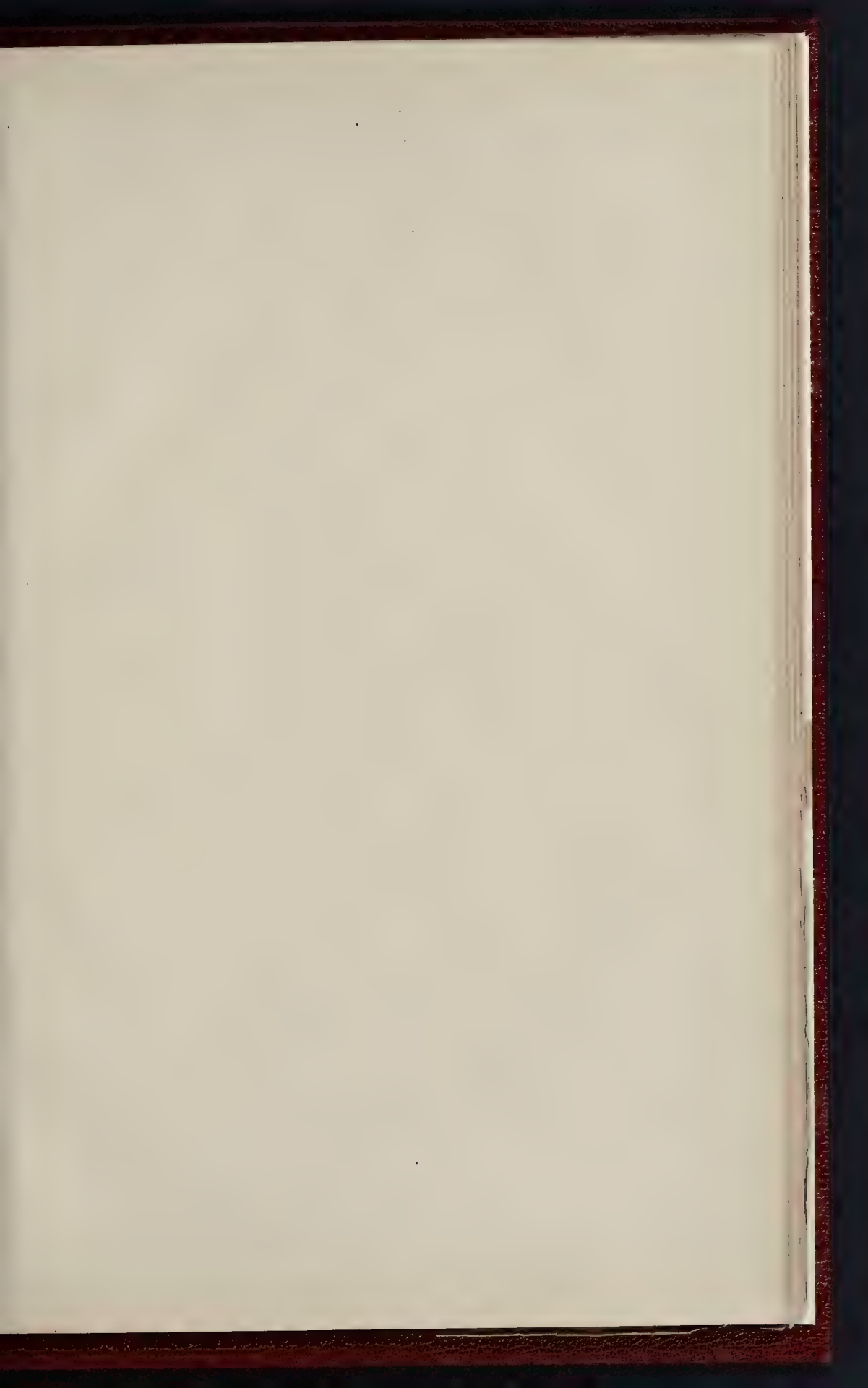




"HILDON," HANTS.—MR. AST



BY DR. T. S. HARRIS, F.R.S. & A.B. EASTMAN, M.D. STREY FETTER, LAND. F.C.



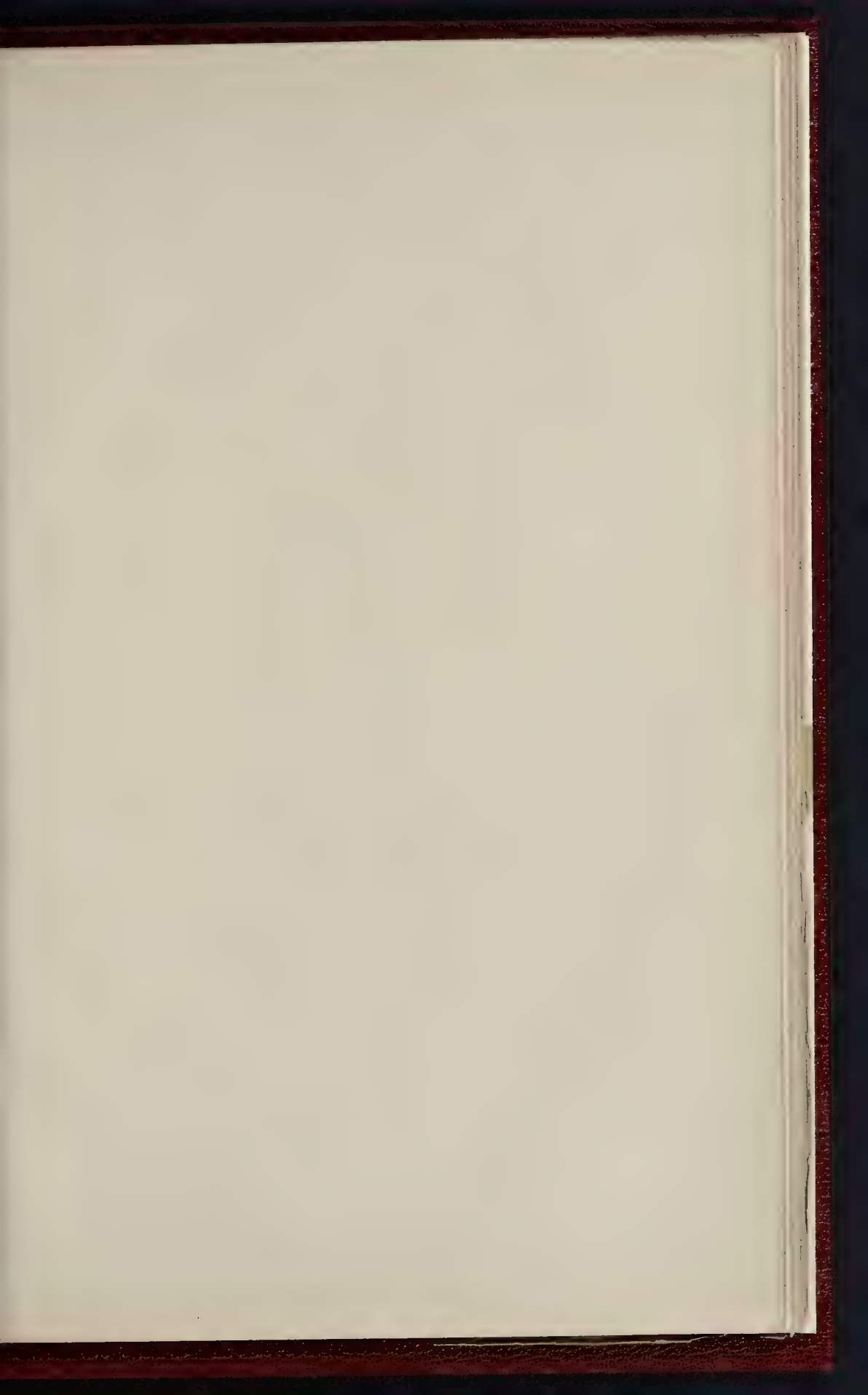


"HILDON," HANTS.—MR. A.



INK PHOTO SPRACUE & CO. LTD. 4 & 5 EAST HARDING STREET FETTER LANE E.C.

WEBB, F.R.I.B.A., ARCHITECT.

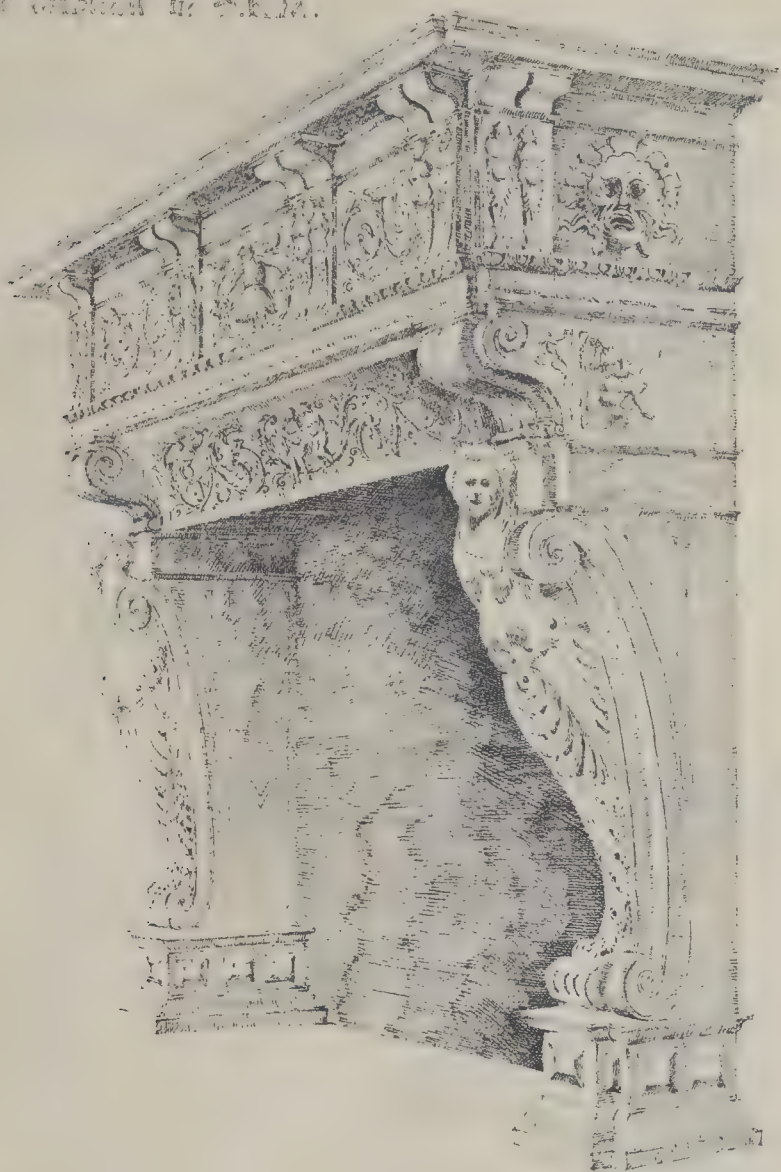




BRITISH DESIGNER
ITALIAN 18th CENT.

426
1901 08

Chimney Piece in carved stone
above a fireplace near Pisa
Italy, about 1560
Now in collection of A.R.A.



east, were erected previously. The grounds are being laid out by Mr. H. E. Milner.

The builders are Messrs. Jenkins & Son, of Southampton, and Mr. H. W. Gray is the clerk of the works. Mr. Aston Webb is the architect. The two views of the house are exhibited at the Royal Academy.

BRONZE BRACKET, SOUTH KENSINGTON MUSEUM.

This bracket is one of a pair in the South Kensington Museum. They are Italian work, of early sixteenth century date, and were used as supports to candles or lamps.

The illustration is from a pencil drawing by Mr. H. F. Waring.

CHIMNEY-PIECE, SOUTH KENSINGTON MUSEUM.

THIS is a chimney-piece of Italian work of the middle of the sixteenth century, of which the original is in the South Kensington Museum, and is rather vaguely described as "from a palace near Brescia." It is of a very fine type of Renaissance work, and the treatment of the two console figures, with their heads turned outwards towards each side, instead of being centralised in the more usual manner, forms a pretty and characteristic incident in the work.

The illustration is from a pencil drawing by Mr. H. F. Waring.

THE LONDON BUILDING ACT, 1894.

THE TRIBUNAL OF APPEAL AND DEVIATIONS.

THE Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institution on Wednesday to hear an appeal lodged on behalf of the Lion Brewery Company, Limited, by Messrs. Layton, Sons, & London, solicitors, against the decision of the London County Council, contained in a resolution passed on May 10, refusing to sanction certain deviations from the plan certified by the District Surveyor under Section 43 of the Act, so far as relates to the proposed rebuilding of No. 29, Foubert's-place, Regent-street. The members of the Tribunal sitting were Messrs. Arthur Cates, A. A. Hudson, and J. W. Penfold. The appellants were represented by Mr. A. F. Wootton, barrister, and the County Council by Mr. Seager Berry.

Mr. Wootton, in opening the case for the appellants, said this was an appeal of a somewhat similar nature to that which the Tribunal had previously allowed under certain circumstances in regard to an adjoining building in Foubert's-place. He thought this was a case of some little hardship upon the builders and owners, because, although on January 11 they submitted plans, it was not until May 11 that they got the decision of the County Council on the matter. The application was to deviate under Section 43 of the Act from old certified plans. That application had been absolutely refused, as shown by the letter of February 10 from Mr. Blashill, the Council's Superintendent Architect, stating that as more land would be occupied by the proposed new building than was occupied by the old, the Council had no power to entertain the application. A discussion then took place between the respective parties, with the result that it was decided fresh application should be made to the Council, when it was understood they would not take up the *non possumus* position they had taken up before. The second application was therefore made on April 18. Much to his clients' surprise, on May 12 they received intimation that the Council had passed a resolution refusing sanction. After that there was nothing to do but to bring the matter before the Tribunal. The deviations desired were to the following effect:—It would be seen by the old certified plans that on the west side of the small back yard there was a building which extended to the height of one story. On the east side there was a two-story building. Now, the deviation which they wished to make was to take the building which was on the west side and add it on to the building on the east side. That deviation would not entail the occupying of any more space than was originally occupied by the building already there. Another deviation was to carry that building on the east side one story higher. Then, on the additional plans which were sent with the second application there was shown an iron staircase which went up from the yard, and which, rightly or wrongly, his clients did not regard as a deviation, and certainly not an erection within the meaning of the Act such as they might not place there, because the amount of air space occupied by the staircase would be infinitesimal. Therefore, what was intended to be done was to transfer a building from one place to the other (at the same time not to occupy more superficial area) and to carry that building up one story higher. In the space they were now seeking to use for an additional story there was a "flying" chimney, so that they were not really purposing to take up much more of the cubical air

space. They also purposed giving up a little space on the north side of the yard, and in addition to that they had dug out under the basement and had covered the yard with a grating, so that they had given additional air space to the cellars below. He did not know what reason his friend Mr. Berry would give for the refusal of the application, but it was his contention that by Sub-Section 2 and Section 43 of the Act the Council had no power to refuse sanction. This section laid it down that if a person erecting an intended domestic building should desire to deviate, it should be lawful for him to apply to the County Council for sanction, and they shall sanction on such conditions as they might think fit. He submitted that no Act of Parliament had ever yet been construed so that the word "shall" meant "may." It seemed an obvious conclusion that what the County Council were required to do was to sanction the deviations, and the only discretion given to them was to impose conditions. He submitted that in this case the Council had made a dangerous precedent, and one entirely outside their powers.

Mr. Hudson: Do you say the Council are bound to sanction any kind of plans whatsoever so long as they impose conditions?

Mr. Wootton: I suggest the Council would cover themselves by saying the builder must follow out all the conditions prescribed for domestic buildings erected after the commencement of this Act.

Mr. Leonard Goodwin, of Messrs. Goodwin & Sons, architect, was then called and gave evidence in support of counsel's statement.

In reply to Mr. Seager Berry, Mr. Goodwin said they would by the proposed deviations considerably reduce the air space (to the extent of one-third) above the level of the first floor. The iron staircase outside would give better exit in case of fire. There would be no staircase on the inside.

By Mr. Wootton: He was not actually wedded to the erection of the iron staircase, and had the County Council imposed a condition that the staircase must go up inside the building, he would have raised no possible objection to such a condition. Instead of that, all the intimation received was that as the new buildings would occupy more land, sanction would be refused.

Mr. Goodwin then presented an alternative scheme, which had been prepared to meet such a condition had it been made.

By Mr. Berry: He had not submitted any such scheme to the County Council.

Mr. Seager Berry, in replying to the case on behalf of the Council, said, on the point raised by Mr. Wootton as to the wording of sub-section 2 of section 43 he would admit there might be a point of law. Mr. Wootton had contended that the word "shall" meant "must." In his opinion it was difficult to say whether such words always did bear an imperative meaning. In the case of *in re Lord Thurlow ex parte the Official Receiver*, Lord Esher had laid it down that the word "shall" had not always an obligatory meaning, but might at times have a directory meaning. So far as he could judge, general circumstances whether it was permissive or obligatory. His contention was that in this case it was only permissive, enabling the County Council to give consent if they thought fit.

The Chairman at this stage pointed out that perhaps some arrangement might be come to between the parties so that the appeal might be allowed, subject to conditions somewhat on the lines suggested by Mr. Goodwin's alternative scheme.

Mr. Berry said under these circumstances he need not argue the point of law further. He must ask, however, that the proposed building be kept down to the building line adjoining.

The following arrangement was then agreed to:—That in the rear of the main building, which shall not exceed a depth of 24 ft. 6 in. from the front in Foubert's-place, there shall be provided on the level of the first floor an open air space, open to the sky, exclusively belonging to such building, extending to the northern boundary and of a width on the line of the back wall of the main building of 13 ft. 9 in., and at the northern boundary of 16 ft. and not less than 150 ft. in superficial area, exclusive of party or external walls. That any portion of the new building which may be erected on the remaining space in rear of the main building shall not exceed in height to the eaves of the roof thereof 24 ft. above the level of the pavement in front, or exceed the limit of the diagonal line of 63½ deg.

Mr. Wootton applied for costs, but the Tribunal declined to grant the application.

ELECTRIC LIGHTING, PEMBROKE.—Mr. C. P. Cotton, Inspector to the Local Government Board, recently being an inquiry in the board-room of the Town Hall, Ballsbridge, with reference to the application of the Commissioners as the Urban Sanitary Authority for the sanction of the board to a loan of 33,000l. for electric lighting purposes, and to a loan of 15,000l. for constructing paved channel courses. Mr. Robert Hammond, Consulting Electrical Engineer, gave evidence, and Mr. Charles France, architect, Bradford, gave evidence as to the plans for the necessary buildings, &c., the cost of which would be about 6,000l. Mr. John H. Middleton, C.E., gave evidence as to the second branch of the application.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XXIV.

IT must not be forgotten by the student that, whether he is dealing with retaining walls or with any other kind of walls, the load on the soil at the bottom of the foundations must not be more than the soil in question can bear with safety.

The safe load that can be put upon various kinds of soil differs largely, and it is not an easy matter to determine, without careful experiment, how much load any particular soil will safely carry per square foot of its surface. There are certain figures, however, which are pretty generally accepted, and which will serve as a guide to the student.

Rankine advises that the safe load on an earth foundation should not be assumed at more than one to one and a half tons per square foot, but experience has shown that on good compact gravel, sand, or loam, two to three tons per square foot is a quite safe figure, provided the depth of the foundation is sufficient to protect the earth from atmospheric influence, either of heat, frost, or wet, and even as much as five or six tons may be placed upon such good soil if there is no objection to a certain amount of subsidence, in which case, of course, the loads should be carefully distributed so as to ensure equal subsidence of all parts of the building. Indeed, as it is probable that all soils ordinarily met with in building become compressed to some slight extent when a load is placed upon them, the student should regard it as an imperative necessity for sound construction that the load of his building should be evenly distributed over the whole area. The usual method of obtaining equal pressure upon the earth is of course the use of concrete, but too often the concrete is put in somewhat unthinkingly, so that an even distribution of pressure is not obtained.

Any vibration occurring in the building itself, or in proximity to it, will largely increase the effect of the load upon the earth, and almost invariably causes settlement or the sinking of the earth under the load placed upon it.

Clay is ordinarily more compressible than the soils we have mentioned above, and should not, therefore, be loaded with more than from one to two and a half tons per square foot, according to its nature and quality, as there is a considerable difference, indicated by the figures we have just mentioned, between the bearing powers of different clays. In dealing with clay it is particularly important that the foundation should be carried sufficiently deep to preserve the earth from the adverse influence of weather and atmospheric action. The method of calculating the pressure upon the soil brought to bear by any particular building presents no difficulty. Let us suppose, for the sake of example, that we have a pier 3 ft. by 3 ft. on plan, with a load of 6 tons per square foot on the bottom course of the pier, and that we have to deal with a soil which can only be trusted to carry 1½ tons per square foot. The bearing power of the soil is, therefore, one-fourth of the load on the pier, and we should require the bottom of our foundations where it rests upon the earth to have four times the area of the pier. The area of the pier is 3 ft. by 3 ft., equal to 9 ft. super; the area of the bottom of our foundation should, therefore, be four times nine, equal to 36 ft., and the plan of our foundation will be a square 6 ft. by 6 ft.

It sometimes occurs that soils are met with which will not bear even as little as one ton per square foot; thus, in silty soils, settlement would take place probably at the rate of from 3 to 12 in. per ton per square foot with a quiescent load.

In such cases there are various expedients open, for some of which calculations may have to be made. One of the best known of these is piling. Unfortunately there are so many factors concerned with the bearing power of piles that it is practically impossible to lay down a rigid rule which shall be satisfactorily applicable in all cases. Undoubtedly the ground itself, though not sufficiently trustworthy to bear the whole load, does carry some portion of the weight of the building. It is, however, the custom to assume that the pile is to carry the whole load, which certainly is on the right side; but even so it is difficult to assign a proper weight to each pile, particularly in clay soils, as there

is a possibility and even a probability that water will work its way down between the pile and the clay, thus diminishing the amount of friction between the pile and the earth around it, which is one of the most important elements in the bearing power of piles. Piles do not ordinarily carry the weight upon them by resting on firmer soil beneath them, but by the resistance to sinking which the friction against their sides affords. Any cause, therefore, which lessens this friction, whether it be the percolation of water, or vibration in the building or near it, will cause a diminution of the friction, and therefore of the sustaining power of the pile.

Taking a line through experience, we find in the case of London Bridge each pile under some of the piers sustains a load of 80 tons, and as they are 12 in. square, this means 80 tons per square foot; numerous settlements have, however, occurred in the piers, and it is not going too far to say that this load is excessive. At Blackfriars Bridge the load on the piled area is 5½ tons per square foot, the piled area including both the piles and the clay enclosed by them. Here, again, considerable settlement has occurred, probably by the bodily settlement of the mass of piled clay into the unpiled clay below it, the piles and earth having sunk together. At the Hull Docks piles carry between 20 and 25 tons each, and they are 10 in. square. Other examples might be quoted of piles loaded with from 20 to 70 tons per square foot of area of the head of the piles. A good rule for the bearing power of piles is, for the extreme bearing power multiply the cube root of the fall in feet of the hammer used in driving by the weight of the hammer in pounds, and this product by '023, and divide by the amount of the last sinking in inches plus one. Thus, supposing a pile were being driven by a 600 lbs. hammer falling 27 ft., and at the last blow the sinking of the pile were half an inch, we should have $L = \frac{3 \times 600 \times '023}{\frac{1}{2} + 1}$

$$= \frac{1,200 \times '023}{1.5} \\ = 27.6 \text{ tons.}$$

Only a proportion of the extreme load thus found should be taken as the safe load. This proportion should not exceed one-half if the piles are being driven in firm soil, and one-sixth if in soft river mud or silt. If the work is subject to vibration, these figures should be halved. It is, of course, assumed that the piles have not been driven down to solid rock.

We have intimated above that the bearing power of piles is principally due to the friction against their sides, but it is difficult to calculate their bearing power with certainty from an estimate of this friction, as it is well nigh impossible to determine before actual driving what the friction is in any particular case between the piles and the earth into which they are driven, and it is probable that the friction even in the most favourable instances does not exceed one ton per square foot, whilst with ordinary soils and clay it may be about half to three-quarters of a ton, and in silt and wet river mud no more than one-tenth to one-fifth of a ton per square foot of pile surface.

Making a calculation of bearing power by an estimate of friction is useful in dealing with piers of masonry, brickwork, or concrete used in made ground or other faulty soil. This may be of very great depth, and adequate support may be obtained without going right through down to the firm soil beneath. Thus, supposing we had 60 ft. of made ground, and sank a concrete pier, 3 ft. by 3 ft., for 40 ft. only, then if we assume that the friction between the pier and the soil is one quarter of a ton per square foot, we should calculate the bearing power of our pier thus:—the superficial area of the surface of the pier is $40 \times 12 = 480$ square feet, and the bearing power, therefore, $480 \times \frac{1}{4} = 120$ tons.

CHAPTER XXV.

ALTHOUGH not often taken into consideration by architects, so much of the science of hydraulics as relates to the flow of water and other fluids through pipes should receive the attention of the architectural student.

In the theoretical investigation of hydraulics, pipes are assumed to be laid in straight lines, and perfectly free from all obstruction to the flow, but these conditions are not generally found in practice. Pipes are not laid perfectly straight, nor are they perfectly smooth or of uniform diameter, and irregularity in these respects tends to retard the flow. It is therefore advisable, under all circumstances, to

make the size of the pipes sufficiently large (theoretically) to discharge 20 per cent. more fluid than the amount actually required. And, in addition to this, if there is any probability of the interior of the pipes becoming lessened in area by deposit or encrustation, a still further increase of size ought to be allowed.

In speaking of the force which causes water and other fluids to move through pipes, the term "head" is generally used. By "head" is meant the vertical height from the top of the highest surface of the water to the centre of the orifice through which it is flowing. It does not matter whether the horizontal distance between the top of the water and the point of the orifice is small or great, nor whether the piping goes straight from one point to the other, or by a circuitous route, even, possibly, for part of the distance below the horizontal level of the orifice; the "head" is still the same. Thus, if we had a cistern at the top of a house, and a bath-room on the first floor, the amount of the head would still be the same, even if the pipe from the cistern to the bath-room went down to the basement and then rose to the bath-room, or if it went direct from the cistern to the point of discharge. The work, however, which the head or force has to do would vary considerably in the two cases.

In every instance the head has three kinds of work to do: first, to overcome the obstruction of entry into the pipe; second, to overcome the resistance of the flow caused by friction against the sides of the pipe; and third, to produce velocity of flow in the pipe, and it is a common practice to speak of these as the "entry head," or head of entry, the "frictional head," and the "velocity head," or head of velocity, or effective head, since it is this last alone which is the net force performing effective work in causing the flow of fluid through the pipe.

The head of velocity is the height through which a body must fall in vacuum to acquire the velocity with which the water actually flows through the pipe, it is therefore equal to $\frac{V^2}{2G}$ in which V is the velocity in feet per

second, and G is the acceleration of gravity or 32.2 ft. The head of entry is, with ordinary pipes having square edges, often taken at half the velocity head, or it may be found more accurately by the formula $H_e = V^2 \times C$ where H_e is the loss of head on entry or head of entry, V is the average velocity in the pipe, and C is a constant whose value for round openings with square edge is '007849, for played or bell-mouthed openings to a circular pipe '000444, and for square-edged circular pipes projecting into the cistern, '014846.

The frictional head or loss of force due to the resistance of the pipes includes the losses due to angles or bends in the pipe, and the loss due to friction against the sides of the pipe.

For the head lost by angles or elbows in a pipe, Hurst gives the formula

$$H_a = \frac{V^2}{64.4} \left('9457 \sin^2 \frac{\phi}{2} + '2047 \sin^4 \frac{\phi}{2} \right)$$

Where ϕ is the angle of deflection from the straight portion of the pipe and for the convenience of those of us who are not expert mathematicians, the formula is modified to the simpler form $H_a = V^2 \times C$ where C is the value for different angles of the remaining factors in the original formula, thus:—

C = '000109	when	angle of deflection = 10°
= '000466	"	" " " = 20°
= '001134	"	" " " = 30°
= '002158	"	" " " = 40°
= '003634	"	" " " = 50°
= '005952	"	" " " = 60°
= '008276	"	" " " = 70°
= '011491	"	" " " = 80°
= '015248	"	" " " = 90°

For the loss of head due to circular bends Hurst gives when the radius of the axis of the bend is greater than five diameters of the pipe,

$$H_b = \frac{V^2 \theta}{88.480} \text{ where } H_b \text{ is the loss of head}$$

due to the bend, V the velocity in the pipe and θ the number of degrees in the bend.

For cases where the radius of the bend is less than five diameters, Weisbach's formula is given as being more accurate, thus:—

$$H_b = \frac{V^2 \theta}{11592} \left('131 + '1847 \left(\frac{d}{2r} \right)^2 \right) \text{ where } d$$

is the internal diameter of the pipe and r the radius of the axis of the bend, both in inches.

For smooth, cylindrical, cast-iron pipes, the loss of head by friction against the sides of the

pipe can be found by Weisbach's formula, thus:—

$$H_f = \left('0144 + \frac{'01716}{\sqrt{V}} \right) \times \frac{L}{D} \times \frac{V^2}{64.4}$$

Where H_f is the frictional head in feet, V is velocity in feet per second, L is length of pipe in feet, and D is diameter of pipe in feet.

The total head required, therefore, to furnish a given velocity in a pipe would be found by adding together the head of velocity, the head of entry, and the head of friction (including that required for bends or elbows).

Hurst gives also the following formulae from Eytelwein, which are much used:—

For open channels, and pipes which are not running full:—

$$V = 95 \sqrt{RS}$$

$$Q = 95 A \sqrt{RS}$$

For pipes running full:—

$$V = 13.7255 \sqrt{dS}$$

$$G = 28 \sqrt{d^2 S}$$

$$H = \frac{G^2 L}{784 d^5}$$

$$d = \sqrt[5]{\frac{G^2 L}{784 H}}$$

$$L = \frac{784 H}{G^2}$$

In these formulae, A is sectional area of flowing stream in feet, d is diameter of pipe in inches, G is supply in gallons per minute, H is head of water in feet, L is length of pipe in feet, Q is discharge in cubic feet per second, V is velocity in feet per second, R is hydraulic radius or mean depth (which in open channels or partially full pipes is the sectional area divided by the wetted perimeter, and in pipes running full is one-quarter of the diameter), S is the sine of the inclination of the pipe—that is, the total fall divided by the total length.

A simple and convenient formula is Darcy's, which although not quite accurate has its error on the right side for practical work. This is

$$V = C \sqrt{\frac{D}{4} \times \frac{H}{L}}$$

where V is velocity in feet per second, D is diameter of pipe in feet, H is effective head in feet, that is the actual head less the loss due to entry, bends and angles, L is length of pipe in feet, and C is a constant whose value for ½ in. pipe is 65; for ¾ in., 80; for 1 in., 93; for 1 ¼ in., 99; for 1 ½ in., 102; for 1 ¾ in., 103; for 2 in., 105; for 2 ½ in., 106; for 3 in., 107.

GENERAL BUILDING NEWS.

CATHOLIC CHURCH, PRINCETHORPE, WARWICKSHIRE.—The foundation-stone has just been laid of a Roman Catholic Church, Princethorpe. The church, which is dedicated to Our Lady of the Angels and St. John the Evangelist, consists of nuns' choir, chancel, transepts, strangers' chapel, ante-choir, nuns' and priests' sacristies, &c. The chancel is terminated by a five-sided apse. The clearstory of the chancel, in each bay of which is a two-light window, is supported by nine arches resting on stone shafts. Outside this is an ambulatory extending round the apse. A chapel projects from the centre bay. The bay on either side is filled with a three-light window. In two other bays of the ambulatory are recesses for altars. The strangers' chapel is on the south side of the chancel, and at this point the wall of the ambulatory is pierced with two arches, which enables those in the strangers' chapel to see the altar. An arch divides the chancel from the crossing, and there is another arch between the crossing and nuns' choir. The organ will be placed in a gallery in the south transept, supported on two stone arches. There is a similar treatment in the north transept supporting a tribune, which will be connected with the infirmary. The nuns' choir is lit by two two-light windows in each bay, and also by a five-light window in the west gable. A gallery is provided for the lay sisters at the west end, over the ante-choir. The nuns' and priests' sacristies are placed in the south side of the nuns' choir. The tower is on the south side of the extreme west, and will rise to a height of about 130 ft. The internal length of the church is 108 ft., and the total length from the chapel at the extreme east to the west wall is 135 ft. The width across the nave and chancel is 31 ft., and the internal height is 46 ft. The church is built of brick, with Russett brick facings, and the dressings are of Greenhill stone. The interior dressings are of Bath stone; oak will be used for the floor of the nuns' choir, and mosaic for the chancel floor. The church has been designed by Messrs. Pugin & Pugin, of London, and the work is being carried out by Messrs. Foster & Dicksee, of Rugby. Mr. Healy is

the clerk of the works. The church is being built on the site of the former domestic offices, and a new suite of such offices has had to be provided. It consists of a laundry block complete, with boiler, scullery, and an extension of the kitchen. The architect for these buildings was Mr. Pugin, and the work has been carried out by Messrs. Foster & Dicksee, of Rugby.

PROPOSED CHURCH, CARLIN HOW, YORKSHIRE.—It is proposed to erect a new church at Carlin How. Plans have been prepared by Mr. Hicks, architect, of Newcastle. The building will be a brick one, and is estimated to cost about 1,000l.

CHURCH, LYTCHETT MINSTER, DORSETSHIRE.—A new church, St. Aldhelm's, has been erected at Lytchett Minster. The building is in the Early English style, and has been built from the plans of the Diocesan Architect, Mr. Crickmay. The internal fittings are of oak, and there is a font of Caen stone, with Purbeck shaft.

CATHOLIC CHURCH, TULLAMORE, IRELAND.—The foundation-stone has just been laid of the new Catholic church at Tullamore. Mr. Wm. Hague, of Dublin, is the architect. The new church will seat 1,600 persons, with additional space for 500 more on special occasions. The cost is estimated at about 15,000l.

ST. PHILIP'S CHURCH, WEST BROMWICH.—The foundation-stone of this church, which, when completed, is to accommodate 750 people, has just been laid. At present it is intended to erect the nave and side aisles at a cost of 4,000l, and to accommodate 270 people. The contractor is Mr. J. Dallow, of Blackheath. Messrs. Wood & Kendrick are the architects.

CHAPEL, &c., BATH ROYAL UNITED HOSPITAL.—On the 6th inst. the Bishop of Bath and Wells dedicated, at the Bath Royal United Hospital, the most recent addition to the building, a chapel, to be named St. Luke's. The chapel will accommodate about 150 people. There is a chaplain's room adjoining, and beneath are new kitchens and a scullery—the whole of the scheme having been carried out at an expenditure of about 2,000l. A stained-glass window, in memory of Nurse Margaret Evans, has been placed in the new building. Messrs. Browne & Gill, of Bath, were the architects.

WOODVALE PRESBYTERIAN CHURCH, BELFAST.—The memorial stones in connexion with this church were laid on the 4th inst. The new building has been designed to occupy a site facing the Shankill road, adjacent to Woodvale Park. As one side of the building is turned to the Whiterock-road, a square tower with stone spire is placed at the angle. Upwards of 1,000 sittings being required, the plan of a simple nave and aisles, with shallow transepts occupying an oblong space of about 90 ft. by 70 ft. has been adopted. The tower, which is pierced by lancet windows, and crowned by a cornice and stone spire, rises to a total height of 120 ft. An angular projection is placed on the opposite angle of the main gable. A space has been reserved at the rear of the church for a lecture hall. The contractor for the entire work is Mr. Thomas M'Millan, and the architects are Messrs. Young & Mackenzie, Belfast. The new building will cost 5,000l.

CATHOLIC CHURCH, GORING.—A new Catholic Church has just been opened in Ferry-lane, Goring. Mr. Ravenscroft was the architect.

WESLEYAN METHODIST CHURCH, CHELMSFORD.—A new church for the Wesleyan Methodists has just been opened, at Chelmsford. The architects were Messrs. Gordon, Lowther, & Gunton, of London, whose designs were selected in competition. The style is Late Decorated throughout. The main entrance faces the High-street. In addition to the church, there are Sunday schools, church parlour, and vestries. The interior of the church consists of a nave, two transepts, a chancel, and an organ chamber. Over each transept is a gallery to hold 200 children in all, and over the nave there is a gallery to seat 100. The staircase approaching the latter is of stone, with iron balustrades, the staircases to the transept galleries being of pitch-pine. The church on the ground floor will seat 650 adults. The choir will occupy the chancel. The pulpit, which is situated on the right of the chancel, is of oak. The floors of the aisles are of wood blocks, the tower entrance, narthex, and chancel being paved with mosaic. The large schoolroom provides for 400 children, and the infants' schoolroom for 150. The building has been fitted out without with the electric light by Messrs. Christy & Norris.

PRIMITIVE METHODIST CHURCH, WATFORD.—A new Primitive Methodist church has just been opened at Watford, in St. Albans-road. At the entrance is a brick porch leading to a vestibule and a hall. The hall is opposite the entrance, and at the same end is the vestry, which will be used as a classroom. The exterior of the building is faced with Fletton red bricks, relieved with Bath stone dressings; the constructive timbers are of Baltic deal, and the whole of the internal joinery is of pitch pine, slightly stained and varnished. The tower of the building is used as an extractor. Vauxhall slates are used for covering the roof. The greater part of the congregation is provided for on the ground floor; a small proportion only in an end gallery. A large vestry or classroom and two smaller ones and lavatory are provided in the rear. The heating is by low-pressure hot water. The total accommodation is for 460 persons. The

estimated cost is 1,650l. The building and fittings have been designed and erected under the supervision of the architects, Messrs. Thomas & Charles B. Howdill, Leeds. Messrs. Cannon & Fisher, of Northwood, were the builders.

METHODIST CHURCH, WEST HARTLEPOOL.—The foundation stones of the new Methodist New Connexion Church, Park-road, West Hartlepool, were laid on the 8th inst. The building will consist of a church to accommodate 550, and schools with accommodation for 400. There will be numerous class-rooms and vestries. The estimated cost is about 4,700l. Mr. Garry is the architect, and Messrs. Howe & Co. the builders.

GARTH C.M. CHAPEL, PORTMAUDOC.—This chapel was opened recently. The building, which is 62 ft. long by 46 ft. 6 in. wide, will accommodate about 800 people. The schoolroom underneath is 54 ft. long by 27 ft. wide, with class-rooms. The architects were Messrs. Owen Morris, Roberts, & Son, Portmadoc, the contractors being Messrs. S. Roberts, W. Owen, J. Williams, and J. T. Jones. The cost will be about 5,000l.

CONGREGATIONAL CHURCH, KETTERING.—The memorial stones in connexion with the new Congregational Church, which is being erected on the London-road, Kettering, were laid on the 7th inst. The architect is Mr. H. A. Cooper, and the builders Messrs. C. & F. Henson. The church is situated at the corner of the London-road and St. Peter's-avenue. Inside, the church is arranged on an amphitheatre principle, the total length of the main body of the church, exclusive of the choir space, being about 61 ft. long by 45 ft. wide, except at the transept, where the width is 67 ft. At the rear of the rostrum is seating for the choir. Behind the main portion of the building are several rooms, all of which have separate entrances from corridors at the rear of the church. The total length of the building is 103 ft. and the total width is 71 ft. The contract for the erection of the building being 4,550l. The church is being built of red brick with Weldon stone dressing.

METHODIST CHURCH, ST. IVES, CORNWALL.—The foundation-stones of the Methodist New Connexion chapel, now being erected at St. Ives, were laid recently. The site is at the junction of Bedford-road, High-street, and Tregenna-place, on which both chapel and school premises are to be erected. Mr. Firth, of Oldham, is the architect. The tender of Mr. Sandry, of St. Ives, was accepted.

NEW FREE CHURCH, COLMONELL, AYRSHIRE.—The memorial-stone of a new Free Church at Colmonell was laid recently. The church, which is being built from the design of Mr. Alex. Petrie, Glasgow, is in the Gothic style, and the principal external feature will be a square tower rising to a height of 55 ft. The plan of the church is cruciform, with nave, transept, and apse, and will accommodate 250 persons. The cost will be about 1,650l.

CONGREGATIONAL CHURCH, CROYDON.—The Congregational Church, Selhurst-road, Croydon, has undergone extensive improvement by the provision of new leaded lights, and new pulpit, raised platform, and choir seats in Kauri pine and Sequoia panels. The pulpit stands on a base (octagonal) of Kauri pine with Sequoia panels, and oak columns. The walls and ceiling have been coloured with "Duresco" and stencilled to special designs. Messrs. Akers & Co., of South Norwood, were the builders, and the architect was Mr. W. Theobalds, London.

PROPOSED UNION CHURCH, WORMIT, N.B.—It is proposed to erect a new free U. P. church at Wormit from plans prepared by Messrs. J. MacLaren & Sons, architects, Dundee. The building will accommodate 500 persons, and the cost will be about 2,700l.

SCHOOLS, GRAYS.—The formal opening ceremony of the New Bridge-road Upper Standard School, Grays, took place recently. Mr. C. M. Shiner has been the architect, and Mr. H. J. Carter was the builder. The school, which consists of two floors, occupies a space of about 100 ft. by 60 ft., and is in the Queen Anne style. Rising from a substructure of blue Staffordshire brick, the main portion of the building is in grey stocks, with yellow stock facings and relieving arches of red bricks. The main entrance, with ornamental reliefs of red bricks and Ham Hill stone dressings, fronts the road. Other entrances are provided on the right and left to the playgrounds, but, from the road, staircases inside the main entrance lead up to the boys' and down to the girls' departments. The roofs are of Welsh slates, with red ridges and finials. An assembly-room and four class-rooms are provided on each floor for the accommodation of the 300 children of either sex. On the mezzanine-floor is the mistress's room. The entire school is heated by Benham & Sons' hot water apparatus, with radiators in each room, and provision is also made for cookery classes and demonstrations. Double staircases are arranged for the children, with separate staircases for masters and mistresses. Separate playgrounds, covered playsheds, and offices, are provided at the rear, and cellars underneath will be used for storage. The cost of the present building is about 10,000l.

NEW WYMOUTH HOUSE SCHOOLS, BATH.—These buildings, which have been rebuilt, were opened a few days ago. The buildings are three stories high, and being placed in the centre of the land divide the boys' playground from that of the

girls' and infants', the former having their entrance from Abbey Green, the latter at the back of St. James's Church. Each floor consists of a main school and two class-rooms. Glazed screens divide the schoolroom from the class-rooms. Hat and cloak accommodation, lavatories, &c., are given, and teachers' rooms are provided on each floor. The schools are warmed by means of hot water. The accommodation provided is for boys, 216; girls, 216; infants, 280; or a total number of 712 scholars. The cost of the schools, including boundaries, playgrounds, heating, sanitary blocks, &c., has been 5,874l. During the course of the excavations many traces of the Roman occupation were found, including the tessellated pavement, which was taken up, and has been relaid in the Roman Promenade. The work has been carried out by Messrs. Jacob Long & Sons, under the superintendence of Mr. C. H. Oliver, architect, of Bath, while Messrs. Haden & Son, of Trowbridge, were responsible for the heating arrangements.

SCHOOLS, DORKING.—Inaugural stones have just been laid of new British Schools in Vincent's-lane, Dorking, Surrey. On the ground floor of the buildings are the schoolrooms for the junior boys and girls, and of the infants. The former measure 48 ft. by 22 ft., and the infants' room 30 ft. by 18 ft. There are also two class-rooms. On the floor above are the schoolrooms of the senior children. A cookery class-room adjoins. There will also be a laboratory. The upper rooms are reached by means of stone stairs, and communicate with the outer porch, this affording separate entrance for the boys and girls. The upper floor of the north-east wing is set apart for caretaker's apartments. Altogether the accommodation will provide for something like 400 children. The work is being carried out by Messrs. Colls & Sons, of Dorking and London. Mr. H. T. Challacombe has superintended the operations, and Mr. J. E. Spicer is the general foreman of the works. The architects are Messrs. Balfour & Turner, of London.

HOLY TRINITY INFANT SCHOOL, TAUNTON.—A new infant school has just been erected in order to provide additional accommodation for the parochial schools of Holy Trinity, Taunton. The architect is Mr. G. C. Strawbridge, and the builder Mr. Wm. Randall.

WESLEYAN DAY SCHOOL, PAULTON, SOMERSETSHIRE.—The memorial stones for this new building have just been laid. The builders are Messrs. Keeling & Sons, Mr. W. F. Bird, of Midsomer Norton, being the architect. The new school will accommodate 300 children. The building is one story in height, and is built of local stone, with freestone dressings. In the suite of rooms there will be three for the mixed school of 184, and two for 126 infants. The three rooms in the mixed department are to be so constructed that they can, by means of folding partitions, be converted into one large room for concerts, public meetings, &c.

THEATRE ROYAL, BARNSELEY.—The corner stones of the new Theatre Royal, Barnsley, were laid. The new theatre is being erected on the site of the old building, and a row of cottages which ran by the side of it. Mr. Walter Emden, of London, prepared the plans, which are being carried out under the superintendence of Mr. H. Crawshaw, Barnsley. The tenders already let amount to about 10,000l, and there are other works to be executed which will bring the total cost to about 16,000l. The building will have seating accommodation for 1,400. The stage, as a whole, will have a width of 90 ft. and a depth of 30 ft.

TOWN HALL, ROTHES, MORAYSHIRE.—The foundation-stone has just been laid of the new Town Hall in Rothies. The architect is Mr. Pratt, of Elgin, whose plans were selected in competition. The hall measures about 70 ft. long by 35 ft. wide, and will accommodate 600 people. A circular crush lobby gives entrance to the hall and adjoining ante-rooms. There will be a supper-room and refreshment-rooms on the ground floor, and ladies' cloak and retiring rooms. At the further end of the hall a small stage will be erected for theatrical and other entertainments, with a store-room underneath and dressing-rooms in the rear. The building is estimated to cost about 2,000l.

PROPOSED NEW MUNICIPAL BUILDINGS FOR DUMBERTON.—At a recent special meeting of Dumbarton Town Council, Provost Garvie moved that the Council agree to erect municipal and police buildings on the site provided by Lord Overton, and that they approve of the plan prepared and submitted by Mr. Thomson as a general design for such buildings. Bailie Buchanan seconded, and the motion was agreed to.

BATHS, GLASGOW.—The new Corporation Baths, for Maryhill, Glasgow, have just been opened. The buildings have been erected from plans prepared by Mr. McDonald, the City Engineer, on a corner site with a frontage of 117 ft. to Garribair-avenue and 119 ft. 3 in. to Hutcheson-street. The entrances, owing to the fall in the ground, have been made in Hutcheson-street. There are two separate entrances, one to swimming baths and hot baths for males, and one to females' hot baths and public washing-house. The ticket office is situated between the two entrances. The swimming pond is 75 ft. long by 35 ft. broad, and is lined with enamelled brick. There are seventy-two dressing-boxes, shower and foot baths, and lavatory accommodation, also committee-room. A gallery runs all round, and seats

about 300. The roofs are built of steel girders. The walls are all lined with enamelled bricks. There are eighteen first-class and ten second-class hot baths for males, with lavatory accommodation; six hot baths for females, with lavatory. The public wash-house has thirty-six washing stalls, with drying stoves. The outside walls are built with stone from Giffnock Quarries—the front to Gair-braid-avenue having a colonnade with windows to pond-room which are filled with coloured glass. The cost of the buildings will be about 75,500l. The contractors were:—Messrs. Thaw & Campbell; joiner, John Ross; plumber, James Raeside; gas-fitter, James Telfer; slaters, P. Whyte & Co.; painter, Charles Paton; heating, Bryden & Middleton; boilers, Benman & Co.

CATHOLIC CHURCH, LIGONIEL, IRELAND.—On the 12th inst. a Roman Catholic church was dedicated at Ligoniel. The church has been built at a cost of 8,000l., and the contractors were Messrs. Courtney & Bros. The architect was Mr. J. J. McDonnell.

WAREHOUSES AND PREMISES, MANCHESTER.—A new warehouse and shops are being built at the corner of Mount-street and Lloyd-street, Manchester, opposite the Town Hall, and the Corporation, taking advantage of the new building, have arranged for an improved approach into Albert-square, Messrs. Royle & Bennett are the architects, as also of another block of shops and warehouses at the corner of Mosley-street and York-street. Over the way in Mosley-street the new head offices of the Lancashire Mercantile Bank have been completed. Mr. Sankey is the architect. New shops and offices are about to be built in Market-street, near Fountains-street, and Mr. J. W. Beaumont has made the designs of a new warehouse in Dale-street. A new warehouse has been erected for Messrs. Tootal-Broadhurst, Lee, & Company, Limited, in Oxford-street. The building extends from Great Bridgewater-street to the Rochdale Canal, and is of yellow terra-cotta and red brick. The building, of which Mr. J. G. Sankey is the architect, has been set back two yards in Oxford-street.

MIDLAND COUNTIES HOME FOR INCURABLES, LEAMINGTON.—The Lord Mayor of Birmingham laid the foundation-stone, on the 8th inst., of the Victoria extension of the Midland Counties Home for Incurables at Leamington. The new wing will comprise accommodation for thirty-three additional patients, as well as improved quarters for the servants and a new kitchen. The architects are Messrs. W. Henman & Hawley Lloyd.

PROPOSED TOWER, MORECAMBE.—Designs have been submitted for a tower to be erected at Morecambe. A site has been secured in Calton Lodge and grounds, which have a frontage to the promenade between the Central Pier and Emmanuel Church. The proposed tower is to be 232 ft. in height and 130 ft. diameter at the base. In general form it will be a cone, gradually diminishing in diameter, and having four floors above the ground level. A road track, with an electric railway under it, will wind round the outside of the eight principal pillars in spiral form. The top will be readily accessible to pedestrians, the winding roadway, 800 yards in length, being of no greater gradient than one in ten. In the basement is a pavilion, catered to seat several thousand persons. The plans also provide for the laying-out of the remainder of the grounds with band stand, kiosks, &c. Outside the tower on the ground floor it is proposed to erect shops, with waiting and retiring-rooms. The designer and patentee is Mr. Tom Bradley, architect and surveyor, Bingley, with whom Mr. John Tillotson, auctioneer, Bingley and Bradford, is associated in the undertaking. Messrs. W. H. & A. Sugden, of Keighley, are the architects.

BANK BUILDINGS, DUNDEE.—On the 6th inst. plans were submitted to the Town Council for the new offices of the British Linen Bank at West Port, and were approved. On the ground floor, entering at the corner between Scouringburn and Brown-street, are the banking premises. The flats above the bank office will be approached by a staircase entering from Brown-street, giving access to dwelling-houses. The washing arrangements for the tenants' use will be in the attic, where is also a drying-loft, approached by the main staircase. Cellarage is provided in the basement. Messrs. C. & L. Ower are the architects.

PROPOSED TECHNICAL INSTITUTE, TAUNTON.—Colonel C. H. Luard, C.E., an Inspector of the Local Government Board, recently held an inquiry at the Municipal Buildings with reference to an application by the Taunton Town Council to borrow the sum of 1,500l. for the purpose of erecting a technical institute on a site adjoining the Municipal Buildings in Corporation-street, and a further sum of 7,500l. for the construction of a sewer for the relief of the Rowbarton district from flooding through the accumulation of surface water, which the present sewers are insufficient to discharge. The Town Clerk (Mr. G. H. Kite), the Borough Surveyor (Mr. J. H. Smith), and the Consulting Engineer to the Corporation (Mr. Santo Crisp, of Westminster), gave evidence, and there was no opposition to either proposal.

RESIDENTIAL FLATS, NEWINGTON.—At an ordinary meeting of the Newington Vestry recently Mr. Henley, on behalf of the Road and Depot Committee, moved: "That the plan and estimate prepared by Mr. Rowland Plumbe, amounting

to 1,897l., for the erection of three residential flats adjoining the Coroner's Court in Manor-place, be approved." An amendment to refer the matter back to committee was lost, and the committee's recommendation was adopted.

PARISH HALL, GATESHEAD.—The foundation-stones of the Parish Hall, in connexion with the Church of the Venerable Bede, Gateshead, were laid recently. The site of the hall is in Wordsworth-street, at the south-west corner of the church. When completed, the main hall, which will be 76 ft. by 36 ft., will accommodate 450 persons; and in the basement there will be a tea-room with apparatus for heating purposes, together with class and club rooms, and a covered archway leading to the church. The total cost of the building will be between 1,400l. and 1,500l. The architects were Messrs. Oliver and Leeson, and the contractor for the work is Mr. Mauchlan.

COURT-HOUSE AND POLICE STATION, HALIFAX.—The corner stones have just been laid of the new Court-house and police station at Halifax. The exterior of the building is Renaissance in style, freely treated. The Court-house is in the centre of the block, and has open areas on two sides. In every department provision is made for conveniences and cloak-rooms. There is also an open parade ground, part of which is under cover. A coach-house with four-stall stable is at the back. The magistrates will enter from Blackwall. Here, on the ground floor, are the magistrates' cloak-room, retiring-room, and the lunacy-room. The entrance gives access to a wide staircase leading to the magistrates' retiring-rooms and Court-house. One of the rooms is large enough for use as a subsidiary Court. The solicitors' entrance is also from Blackwall; but their rooms, as well as those for clients and witnesses, front to Ferguson-street, where will be the general public entrance. For the latter a large entrance hall is provided. The gaolers' house and matron's apartments are provided on the ground floor. The police entrance is from Carlton-street, and leads into a large entrance hall. The police offices, which front to Harrison-road, are approached by a wide corridor. The charge-room and inquiry office are near the entrance hall, and the cells are placed round the parade ground, which is approached by a special corridor, with prisoners' lobby, search-room, &c. On the right of the entrance hall is a parade-room, and a staircase leads to the first floor, with policemen's lavatories and bath-rooms. The entrance to the warrant office is in Harrison-road, and this leads also to the rooms of the magistrates' clerk, the Chief Constable, and his clerk on the first floor. The total estimated cost is between 13,000l. and 14,000l. The contractor is Mr. G. Charnock, and the architect is Mr. G. Buckley.

TECHNICAL SCHOOL, HALIFAX.—On the 9th inst. the people of Halifax celebrated the Jubilee of the existence of municipal government in their town, when the formal municipalisation of the technical school took place. The school is situated at the north-west corner of the People's Park. The architects were Messrs. Jackson & Fox. The whole structure was completed at a cost of 15,300l., exclusive of furnishing. A description of the building appeared in our columns at the time of the opening.

PUBLIC OFFICES, NEATH.—New offices for the Neath Rural District Council have just been opened. The buildings have been designed by Mr. D. M. Davies, Surveyor to the authority.

PUBLIC BATHS, NORWICH.—The Norwich Corporation baths will shortly be open to the public, the work of converting the old Museum buildings completed. There are six first-class baths, which are of enamelled white porcelain, and were supplied by Messrs. Twyford, of Hanley, the fitters and engineers' work being done by Messrs. T. Bradford & Co., of Manchester and London. The flooring, together with all carpenters' and bricklayers' work, was entrusted to Mr. H. C. Greengrass, of Norwich, and the plumbing and painting to Messrs. T. Horth & Son. Each room is smaller than those of the first class, and are of enamelled cast-iron. There are twenty stand-up baths, with hot and cold water and foot-bath. The lower floor has two compartments, one for the boiler and the other for laundry work. There are two tanks on the roofs, each holding about 500 gallons. In winter the building will be heated by means of steam radiators. The work is being carried out under the direction of the Borough Surveyor, Mr. A. E. Collins.

MALDEN AND COOMBE PUBLIC OFFICES.—At their meeting on the 13th inst. the Establishment Committee of the Malden and Coombe Urban District Council approved of the plans, &c., prepared by Mr. T. V. H. Davison, of New Malden, for the new public offices, central fire station, stabling, mortuary, and post-mortem room.

THE PROPOSED NEW EXCHANGE BUILDING, BIRMINGHAM.—The suggested design for a central Exchange building on the Christ Church site, Birmingham, by Messrs. Henman & Cooper, was approved at a recent meeting held to consider the proposed scheme.

MANSION, TROUP, NEAR ABERDEEN.—Mr. Garden, of Troup, has erected a new mansion on the estate, from designs by Mr. R. G. Wilson, architect, Aberdeen. The house is situated to the south-west

of old Troup House. The new residence is two stories and attic floor in height.

ADDITIONS TO THE YORKSHIRE COLLEGE, LEEDS.—The foundation-stone has just been laid of buildings for the leather trades department of the Yorkshire College. The architects are Messrs. Waterhouse & Son. The buildings will contain, on the ground floor, a laboratory fitted with machinery for leather-finishing, and work-rooms for tanning and dyeing. On the first floor there will be research and bacteriological laboratories, and the second floor will contain store-rooms and drying accommodation and probably a museum.

THEATRE AND OPERA HOUSE, TAUNTON.—It is stated that theatre and opera house buildings are about to be erected at Taunton. The drawings and plans are being prepared by Messrs. Drake & Pizey, architects, Bristol.

UNIVERSITY EXTENSION COLLEGE, READING.—New buildings for the University Extension College, Reading, have just been opened by the Prince of Wales. We propose to illustrate the building shortly, when a description will be given. Mr. S. Slingsby Stallwood, F.S.A., is the architect, and the general contractors are Messrs. Henry Higgs & Sons, of Reading. Mr. Alfred Holt acting as general foreman. The constructional steelwork and fireproof flooring was by Messrs. Mark Fawcett & Co., Westminster; the wood block flooring was carried out by Messrs. Geary & Walker; the artificial stone staircases by Messrs. Wilkinson & Co., Westminster; the sanitary appliances by Messrs. Bolding & Sons, of London; the heating apparatus by Messrs. Rosser & Russell, Ltd., of Charing Cross; the electric lighting by Messrs. T. C. Williams & Sons, of Reading; steel casements, Mr. J. E. Lucas, of London; and for roof glazing in the dormitories, Messrs. Helliwell & Co., Ltd., of London.

BANK, HALIFAX.—The new premises of the Halifax and Huddersfield Union Banking Company have just been opened. All the elevations have been carried out in dressed ashlar from local quarries. The main pediment to the front is supported by four red granite columns. The principal entrance has been made an ornamental feature, and consists of a vestibule, from which is approached two minor vestibules on the right and left. The vestibules are lined with Doulton ware. From the right and minor vestibule entrance is obtained to a public lavatory. A feature has been made in these vestibules of ceramic mosaic pavements. The walls of the hall have been divided into compartments by Corinthian columns, fluted and reeded. The whole scheme of decorative plaster work has been carried out by Messrs. T. Cordingley & Sons, of Bradford. The mosaic pavements have been laid by Messrs. Maw, of Shropshire. On the right hand side of the hall the accountant's rooms are allocated, together with strong-rooms for the books, the bullion, and the plate. The doors for all the strong-rooms have been provided by Messrs. Milner & Son. On the left hand side of the hall, approached through an archway fitted with folding doors, are the manager's room and three waiting-rooms, while adjoining are the directors' board-room and other conveniences. In close proximity to the manager's room is that of the deputy manager, so placed as to overlook the whole of the banking hall proper. On the first floor, rooms, which range round the upper portion of the hall on the street sides, are the various store-rooms for books, stationery, &c.; also directors' and manager's rooms. Placed over the strong rooms are the living rooms of the caretaker, having direct access to the back entrance. The side door on the west of the building will be used by the clerks and others connected with the bank. There is a large amount of lead light work in different departments of the bank, by Mr. Reuben Bennett, of Manchester. The wood-block flooring is by Messrs. Steinitz & Jeffries, London; the stained glass in the banking hall is by Mr. Pape, of Leeds, and the following local firms have fulfilled contracts:—Mason's work, Craven Robinson; carpentering and joinery, A. Halstead & Son; plumbing, J. Naylor & Son; general plastering and slating, J. Bancroft & Son; heating apparatus, J. Naylor & Son; electric light, T. Sunderland & Co.; steel roof, J. Hitchen; painting, J. Binns & Son; concreting, J. Greenwood & Son; furnishing, &c., Mr. Greenwood Howarth. The patent glazing of the large roof has been carried out by Messrs. J. Heywood & Co., Huddersfield, and the carver's work has been done by Richard Harvey, Halifax. Mr. W. Clement Williams was the architect.

NEW POLICE STATION, CROOK, DURHAM.—For some months past building operations have been going on in connexion with the erection of a new police station at Crook. The roof is covered with Welsh slates, whilst the exterior is composed of pressed bricks, supplied by Lowry Bros., of Gateshead. The interior comprises a charge-room, three cells, and a prisoners' airing cage. There are self-contained quarters for a resident sergeant and his family. Upon the upper floors will be found quarters for single constables, consisting of mess-room, dormitory, lavatory, &c. The sole contractor is Mr. G. H. Bell, of Bishop Auckland, whose contract is about 1,800l. The work is being carried out on plans by Mr. Wm. Crozier, County Architect, Durham. The sub-contractors are Mr. S. Kirby, plastering and cementing; Mr. Hudson, car-

penry and joinery work; and Mr. Ed. Thompson, plumbing, all of whom belong to Bishop Auckland. The clerk of the works is Mr. Kilburn, of Durham.

PROPOSED PUBLIC BATHS, BOLTON.—The Bolton Corporation propose spending the sum of 5,250l. in the erection of public baths, on a site adjoining the branch Public Library in High-street. In the basement there will be a boiler-house, coal cellars, cistern-room, and an open gangway, and the sides of the bath will be of concrete, and will contain a plunge or swimming bath, 75 ft. by 26 ft. It will have glazed brick sides and a tiled bottom. The dressing boxes number thirty-nine, and there is also an attendant's room, besides soap and shower baths, and conveniences. Circular staircases will lead to the gallery, which extends round three sides of the bath. The entrances are arranged so that they are controlled from the ticket office. The men's slipper baths—nineteen in number—are on the left of the entrance, there being close by a waiting-room as well as needle and vapour baths. On the first floor of the building are the slipper and other baths for women. A caretaker's house and a laundry have been provided. The building generally has been designed to harmonise with the Free Library adjoining, and will be of red brick with ornamental red terra-cotta dressings. The architect is Mr. R. Knill Freeman, of Bolton.

MASONIC HALL, ROTHERHAM.—On the 2nd inst. a new Masonic Hall at Rotherham was consecrated. On the first level are three shops. An arcade leads to a large public hall, 52 ft. by 38 ft., exclusive of a recessed stage for orchestra. The hall will seat 370 persons. Ante-rooms and cloak-rooms are provided, and a side gallery over the corridor forms a promenade, and leads to a supper-room capable of seating 100 persons. Over the shops and cafe are three offices, and a work-room. The second floor comprises the Masonic rooms, consisting of a lodge-room 33 ft. by 24 ft., a large ante-room, and a supper-room. Accommodation for a caretaker is provided on the third floor, and a lift from the kitchen communicates with various supper-rooms and corridors below. The front elevation of the building is of Stoke stone. The work has been carried out by Mr. Richard Snell, of Rotherham, from the plans and under the superintendence of Mr. E. I. Hubbard, of Rotherham.

SANITARY AND ENGINEERING NEWS.

LUMLEY RIVER BRIDGE.—The Earl of Scarborough, having decided to erect a bridge across the River Wear, adjoining the existing ferry at Lumley Bridge, instructed Messrs. D. Balfour & Son, civil engineers, of London and Newcastle-on-Tyne, to prepare plans for a suitable structure, the contract for which has been let to Messrs. Head, Wrightson, & Co., of Stockton-on-Tees, who expect to start the work this month. The structure consists of a central span of 120 ft., and two side spans, each 37 ft. long. The main and approach girders are to be of mild steel lattice work, the bottom flanges being efficiently web-braced, and the top flanges supported with struts and overhead arches. The flooring is to consist of cross-tied timber, with water board at each side. The piers to be each composed of four wrought-iron piles properly braced, formed of four segments rivetted together, having cast-iron pile points, and to be driven 21 ft. below river-bed. Gates and turnstiles are to be fixed at the end of the bridge, and proper lighting arrangements to be provided. The structure is calculated to stand a safe distributed live load of 140 lbs. to the square foot, with four times this amount for the ultimate load.

EXTENSION OF THE LANARKSHIRE AND Ayrshire RAILWAY.—At Lugton, Ayrshire, the first sod was cut on the 9th inst. of an extension of the Lanarkshire and Ayrshire Railway, which is to connect, by a direct route, the port of Ardrossan with the coal and iron producing districts of Lanarkshire. The engineer of the line is Mr. Charles Forman (of Messrs. Formans & McCall), and the contractors are Messrs. R. McAlpine & Sons.

SEWER, NEWCASTLE-ON-TYNE.—On the 9th inst. Mr. F. H. Tulloch, M. Inst. C.E., Local Government Board Inspector, held an inquiry in the Council Chambers, Newcastle, into the City Council's application for sanction to borrow 6,500l. for works of sewage and 833l. for works of refuse disposal. The Engineer (Mr. Hill Motum) said the 6,500l. was required for the construction of sewers on the east and west sides of the Ouseburn to carry to the river the sewage now discharged from several large sewers into the open burn. It was proposed to lay two sewers on the east side and two on the west side of the burn. The Ouseburn had really been an open sewer; and, in the interests of public health, it was necessary to divert the sewage from the burn into common sewers.

PROMENADE FOR GRANGE-OVER-SANDS.—The Grange-over-Sands Urban Council have adopted plans, and are making application to the Local Government Board for powers to borrow 10,000l., to carry out improvements which have been under consideration for three and a half years. It is proposed that the sewage which now drains upon the foreshore at various points shall be collected and carried beyond the beach along the railway embankment, outside of which will be erected a promenade. The new sea wall will reclaim 5½ acres of land, which will probably be used as a recreation ground.

PUMPING STATION, RUSKINGTON, LINCOLNSHIRE.—At the last monthly meeting of the Ruskington Urban Council, plans were submitted by Mr. J. Clare, C.E., for a tower pumping station, &c., at a cost of 1,700l. The plans were adopted.

REBUILDING OF THE MILL BRIDGE, DONCASTER.—Mr. H. P. Boulois, an inspector of the Local Government Board, held an inquiry at Doncaster on the 7th inst. with respect to an application to approve of the borrowing of 5,500l. to defray a proportion of the cost of the reconstruction of the Mill Bridge.

SEWAGE DISPOSAL, MANCHESTER.—The Rivers Committee of the Manchester Corporation have selected three gentlemen to advise them in the matter of sewage disposal—namely, Mr. Baldwin Latham, C.E., Dr. W. H. Perkin, Professor of organic chemistry at Owens College, and Dr. Percy Frankland, of Birmingham.

NEW PIER, HERNE BAY.—A new deep sea pier is being constructed at Herne Bay. The old pier ran out to a length of only 400 ft. and was left at low tide high and dry. It has now been lengthened by the addition of 3,320 ft. In the new structure there are eight alcoves where the width is 30 ft., and at two points the pier is widened to 66 ft. The pier head when completed will be 76 ft. wide, and will carry an octagonal pavilion 40 ft. wide. Beyond this there will be an independent timber landing stage for the steamers. The pier is built on screw piles entering about 10 ft. into the sea bed, the superstructure being of steel, with a wooden deck which is 14 ft. above the highest water. Mr. E. Matheson is the engineer. An electric tramway runs the whole length of the pier.

BARNHOLM WATER SUPPLY.—On the 11th inst. the new water supply for Barnholm was formally opened by Mr. T. W. Russell, M.P. The new water scheme was designed by Messrs. Thomas Roberts & Son, of Portmadoc, and the works have been carried out under their control and superintendence. The lake (Bodlyn) has an area of thirty-one acres at summer level 1,250 ft. above Ordnance datum. A masonry dam 380 ft. in length has been made across the outlet, 13 ft. in height above summer level, raising the lake 10 ft., and increasing the area from thirty-one to forty-five acres. The storage capacity is 100,000,000 gallons, of which 59,000,000 gallons are for the supply of Barnholm and district, and 41,000,000 gallons compensation water to pass down the river for the mill and riparian owners. The right has been acquired of raising the lake another 3 ft., which would increase the storage capacity 35,000,000 gallons. The service reservoir at Eithinydd has a capacity of 106,500 gallons. Before entering the reservoir the water is passed through a Halliday's patent charcoal steel cylinder filter, capable of filtering 240,000 gallons a day. The old works at Cellwrt are incorporated with the new works. The total cost of the undertaking has been 29,951l.

STAINED GLASS AND DECORATION.

WINDOWS, CRATHIE CHURCH.—Two memorial windows have just been placed in Crathie Church, Deeside. One is Mr. Majest's memorial to the late Duke of Clarence and Avondale. The other window, which has been publicly subscribed for, is being fixed in Crathie Church to commemorate the sixty years' reign. The work has been carried out by Messrs. Clayton & Bell.

MEMORIAL WINDOW, SOUTH HEIGHAM, NORFOLK.—A stained glass memorial window has just been erected at the Church of Holy Trinity, South Heigham. It is from the studio of Mr. W. R. Weyer, of Norwich.

WINDOWS, ST. STEPHEN'S CHURCH, BRISTOL.—Two memorial windows have just been dedicated at St. Stephen's, Bristol. The windows are fixed in the north aisle. Each window is of three lights. The windows are the work of Messrs. Clayton & Bell, London.

FOREIGN.

FRANCE.—The Paris Municipal Council has voted a sum of money for the erection of a monument to be placed in Paris in Chaise, to the unrecognized victims of the Charity Bazaar fire.—It is announced that M. Rodin, the sculptor, has written to the Committee which has been formed to purchase the Balzac statue (which was refused by the Société des Gens de Lettres) saying he does not wish to keep the mark of sympathy, and intends to keep the statue himself.—Last Sunday the monument to the memory of M. Flachet, engineer, was inaugurated in the Boulevard Pereire: it is the work of Alfred Boucher, sculptor, and Gaston Trélat, architect.—Preparations are being made for the erection of a large Palais des Fêtes in the Bois de St. Germain for the 1900 exhibition.—The work of deepening the port at Dieppe is soon to be begun. The expense is calculated at 150,000 francs.—M. de la Rocque is appointed Diocesan Architect at Coutance in place of the late M. Petitgrand; M. Darcy is appointed Diocesan Architect at Nevers, in place of M. de la Rocque; and M. Niret is elected at Langres in place of M. Darcy.—M. Marmottin, architect, of Coulommiers, has just been elected for three years President of the Société des Architectes de Seine et Marne.—M. Boulin, architect, of

St. Etienne, has been elected President of the Société des Architectes de la Loire.—There is a question of erecting a statue of Viollet-le-Duc at Carcassonne.

—The jury of the open competition for the building of a Chamber of Commerce at Grenoble have awarded the prize to M. Revol, architect, of Tignes (Isère).—The death is announced, at the age of 49, of M. Charles Michel, architect-vérificateur of works at Paris.—M. Auguste Truphème, an artist of great talent, has just died in Paris, at the age of 62. He was born at Aix (Bouches du Rhône), and had for his masters Hippolyte Flandrin, Henner, and Bouguereau. He first exhibited at the Salon of 1865, and for several years he made a specialty of scenes from life, taken in the Paris schools, where he superintended the Cours de Peinture. He received medals at the Salons of 1884, 1888, and 1889; in 1895 he received the Legion of Honour. He sent this year two remarkable portraits to the Salon des Artistes Français.

MODEL DWELLINGS, VIENNA.—In the Jubilee Exhibition at Vienna the plans drawn by Messrs. Theodor Bach and Leopold Simony, under the auspices of the new "Franz-Josef I. Jubilee Institution for the erection of dwellings for the people," are on view. The total area—some 50,000 square metres—is divided into five blocks, and the buildings are to be erected gradually, in order to give the builders of the later buildings the advantage of experience derived from observation on the building and letting of those to be first erected. Of the entire surface, 18,326 square metres are to be built over; 24,053 are to be devoted to gardens; and the remaining 6,690 to the necessary streets and communications. The first group of buildings is to be put in hands next month. It will consist of ten three-story dwelling houses, eight of which are to contain apartments for in all about 130 families; a ninth will contain room for about eighty single men; while the tenth will accommodate about 100 single women and girls. It has been decided that the second group shall consist of 237 dwellings of different sizes, occupying 3,629 square metres in all, with 4,258 square metres of garden associated. Of these 28 shall consist of hall, kitchen (8 metres square), and a small room (8 to 10 metres square); 146 shall have a larger chamber (16 to 20 metres) instead of the small one; 52 shall further have a small chamber in addition, and 11 shall have two large chambers. A ladder will be provided to each kitchen, and a watercloset, gas, and water provided to each dwelling. "Borrowed lights" will be avoided. In time a steam-laundry, a crèche, recreation and play grounds, a public bath-house, library and reading-room will be added to the colony. Notwithstanding all these improvements, the rent shall not exceed that customarily paid on the selected site, and the rights of permanent tenants to improvements effected by themselves will be safeguarded. The funds at present at the disposal of the institution exceed 600,000 florins. They hope, however, continually to increase their sphere of influence, and look for important results from their labours.

AUSTRIA.—The town of Baden has decided to pull down the old theatre and build a new one at an estimated cost of 250,000 florins.—The Imperial Minister of War has decided in favour of erecting the new school for artillery cadets at Traiskirchen, near Baden. The building will be adapted for 800 pupils and 40 officers, and will cost 2,000,000 gulden.—As a memorial of the Imperial Jubilee the Council of Wales has resolved to found an institution to be called "The Home of Age," for the aged and impoverished citizens of the town and to provide shelter and support for them. A committee has been appointed to settle on the plans and the regulations, and to make all necessary further arrangements. A site has been selected at the corner of the Dr. Johann Schauer Strasse and the Stelzhammerstrasse, and a grant of about 50,000 florins from the city hospital fund set aside for building purposes.—The ground between the Traunstein and the Salzburgerstrasse, Lambach (near Gmunden), has been purchased by the community for the erection of a district of villas. The work of canalising the watercourses, and laying out streets and roads, is going on with all haste, as well as the arranging the water-supply, and will soon be finished; after which the erection of villas on the sites will at once be commenced.—The Union of Timber Merchants have forwarded a petition to the Imperial Minister of Railways that a station for timber, with a yard annexed, be added to the Vienna railway station.—A military hospital is to be erected in Neustadt, with accommodation for eighty men and thirty officers, as a Jubilee memorial. Professor Franz Ritter von Gruber, Vienna, is to be the architect. It is proposed to lay out the sum of 160,000 to 180,000 florins in the work. The hospital will be erected in a large garden, in which, in time of war, a hospital barracks can be erected.

GREAT NORTHERN AND CITY RAILWAY COMPANY.—A company under this title has just been formed for making a line, about three miles in length, from the Finsbury-park station of the Great Northern Railway to Moorgate-street, and there will be three intermediate stations at Drayton-park, Essex-road, and Old-street, and the line will supply a more direct and much-needed communication between the City and the suburban system of the G.N.R. Sir Douglas Fox and his brother, Mr. Francis Fox, are the engineers for the new works.

MISCELLANEOUS.

APPOINTMENT.—At a recent special meeting of the Winsford Urban Council, Mr. Hulse, contractor and builder, of Winsford, was appointed Surveyor to the authority. There were forty-five applicants for the post.

THE PATENT OFFICE REPORT.—The fifteenth annual report of the Comptroller-General sets forth that the applications for 1897 amounted to 30,058, whereof about 6,000 related to inventions connected with cycling: women inventors contributing 702 (or nearly 23 per cent. of the gross total), including 106 for cycling and about 148 for articles of dress. The increase for the year 1897 is 765, or 2½ per cent., as compared with an increase in the preceding year of 5,131, or 20½ per cent. It appears that the growth in 1897, whilst less in quantity, is of a more substantial quality than the increase in 1896, for in that year the large increase was mainly in applications lodged in a provisional form, whereas last year it was mainly in applications accompanied by completed specifications, rising by 577, or 14 per cent., and those deposited with provisional specifications rose by only 88, or 0·3 per cent. The rate of increase since 1893 proves to be less constant than before. The number of applications (25,380) almost stationary in 1894, fell to 25,062 the next year, rose to 30,103 in 1896, and rose again, albeit slightly, in 1897. Yet the average increase for the four years, taken together, gives the normal average, namely, 5·7 per cent. On the reduction of the initial fees from 25s. to 4s., under the Act of 1883, it was thought probable that the average value of the granted patents would diminish, owing to the facilities conceded for patenting minor and trivial inventions. The expectation is, in a measure, realised; the percentage of sealed patents that run for fourteen years has fallen from 6 to 4·5 per cent.; yet, whilst the ratio is smaller, the actual number of patents continued for their full term is considerably larger than it was before. An appendix to the Report shows that England and Wales were less inventive in 1897 than in 1896, and that the additional applications came chiefly from Scotland, Ireland, the United States, the Continent, South Africa, and Victoria, Tasmania, and New Zealand. Of foreign applications the largest number came from Germany and the United States, being 2,459 and 3,084, as compared with 2,177 and 2,725, respectively, in 1896. The Free Technical Library reckons 111,439 readers, a decrease of 1,056, of whom 35,328 availed themselves of its use after 4 p.m. The western portion of the buildings, facing Staple Inn, was completed in 1897. The whole cost of the new office (including purchase of the site and 4,050l. on account of furniture) is already expended. Receipts from the sale of official publications amounted to 8,564l. (an increase of nearly 900l.), paid over to the Stationery Office. Those from various sources on account of trade marks amounted to 10,397l., and from designs 3,724l.—the total for the twelve months being 23,530l. 3s. 10d., yielding a surplus of 111,299l. 7s. 10d., after payments that comprised 57,022l. 5s. for salaries, 29,100l. for printing and lithographed drawings, and 14,270l. 18s. 6d. for building works. Mr. Dalton concludes his report with a graceful and well-deserved tribute to the labours of his predecessor in office, Sir Reader Lack, who retired in April, and under whose able administration the business of the Patent Office has attained to its present large proportions.

ELECTRIC LIGHTING, STOCKTON.—On the 9th inst., Mr. H. P. Boulnois, C.E., Inspector under the Local Government Board, held an inquiry at the Stockton Town Hall into the application of the Corporation for permission to borrow money to establish an electric installation within the borough. The proposals to install the light through Horton-road, High-street, and Bridge-road, and to make provision also for cables being carried to by-roads. Borrowing powers to the extent of 30,000l. are asked for, and it is proposed to spend 22,000l. of this sum at present.

THE CONTROL OF PUBLIC MONUMENTS.—In the House of Commons on the 10th inst., Sir Elliott Lees asked the First Lord of the Treasury whether, seeing that any memorial which, in pursuance of the resolution of the House and at the public charge, may be erected to Mr. Gladstone in Westminster Abbey would so soon as erected be entirely under the control of the Dean and Chapter of the Abbey, and might at any time be removed or altered by them without the sanction of the House, in like manner as memorials similarly erected by Parliament in St. Paul's Cathedral had been removed and altered, he would grant facilities this Session for the passing into law of the National Monuments in Churches Bill, which was intended to prevent the removal or alteration, unless Parliamentary sanction be first obtained, of monuments erected in churches or cathedrals out of public moneys in pursuance of a vote by Parliament. Mr. Balfour: I suppose that my hon. friend in putting the question has in mind the matter in which he took a strong personal interest in regard to a monument in St. Paul's Cathedral. I do not think there is any imminent danger that the Dean and Chapter are likely to interfere with the monuments in Westminster Abbey, and therefore the danger to which he alludes cannot be described as a pressing one. Sir Elliott Lees: Has the right hon. gentleman realised that a future Dean and Chapter

may possibly take steps to remove monuments? No answer was returned.

BRITISH ARCHEOLOGICAL ASSOCIATION CONGRESS.—The Annual Congress—the fifty-fifth—of this Association will be held at Peterborough this year, from Thursday, July 14, to Wednesday, July 20, with the 21st as an extra day. The headquarters will be the Grand Hotel. The following papers have already been promised:—"Latham Hospital and its Early Statutes," by Lord Melville; "The History of Ramsey Abbey as Illustrated by the MSS. in the British Museum," by Dr. W. de Gray Birch, F.S.A.; "Yaxley and Fotheringhay Churches," by Mr. H. M. Townsend; "The Gentlemen's Society in Connexion with Peterborough," by Mr. C. Dack, local hon. secretary; "Castor Church," by Mr. J. C. Traylen; "The Roman and Saxon Occupation of Peterborough," by Mr. T. J. Walker; "Maxey Church," by the Rev. W. D. Sweeting; "Northborough Church and the Cromwells," by the Rev. H. J. D. Astley; "The Crosses of Fletton and Helpston," by Mr. C. Lynam; "Bury Church, Hunts," by Mr. J. A. Poultier; "Crowland and the Legend of St. Guthlac," by Miss E. Bradley; and "Notes on the Fenlands," by Professor T. McKenny Hughes. Papers will also be contributed by Mr. G. Patrick, hon. secretary, Mr. W. Bodger, local hon. secretary, and others. Visits will be made on Friday, July 15, to Glatton, Little Gidding, Conington Castle, Yaxley Church, and Fletton Church and Cross; on Saturday to Stamford (where the churches, &c., will be described by Mr. Traylen, architect, of Stamford); Burghley House will be described by Mr. J. A. Gutch, F.S.A.; on Monday to Spalding; on Tuesday to Thorpe Hall, Castor, Wansford, Whittington, and Barnack; on Wednesday to the Manor House, of Woodcroft, Helpston Church and Cross, Maxey Church, Deeping St. James, Glington Church, Northborough Church, and Peakirk Church. It is proposed to visit on Thursday, July 21, Fotheringhay Church and Applethorpe Hall and Sibbington Hall. **MEMORIAL DRIVING.**—FOUNTAIN, HAMPTON Wick.—The Hampton Wick permanent memorial of the sixtieth year of the reign of Queen Victoria took the form of a drinking fountain. It has been placed in the High-street, at its junction with Park-road. It is from the design of Mr. H. C. Fread, of East Molesley. There are taps, basins, and drinking cups on three sides of the shaft, and at the back a drinking-trough for horses, with one for dogs underneath. The whole stands on slabs of York stone, and is approached by two steps. Messrs. Welbelove & Sons, of Kingston, carried out the work.

STATUE OF WHITGIFT FOR CROYDON.—A statue of Archbishop Whitgift has been placed on the pedestal left vacant by the architect, Mr. Hennman, on the corner of the Corn Exchange in Katharine-street, Croydon. The statue is the gift of Sir Frederick Edridge. It is of Portland stone, and is the work of Mr. J. Wenlock Rollins.

CARDIFF BUILDERS' OBLIGATIONS.—At a meeting of the Cardiff Public Works Committee recently, a letter was read from Messrs. Veall & Sant, architects, inquiring "by what authority" they were plans of certain buildings in Norfolk-street that the original be kept on the building. It appears that by the regulations of the Public Works Committee a plan of buildings in course of erection is required to be kept on the premises. In this particular instance, Inspector Fitzgerald on calling to inspect buildings, of which Messrs. Veall & Sant are the architects, was referred to the plans to the architects' offices. Mr. Harpur pointed out that the plans were ordered to be kept on the building in order to facilitate the inspector's work. That was the first objection to the rule that had come under his notice. Mr. Veall maintained that the rule was not insisted on in other cases, and explained that the expense of valuable plans on the building entailed needless expense, seeing that copies could be seen either at the office of the architect or the Borough Engineer. The matter was referred to the consideration of the Borough Engineer.—*South Wales Daily News.*

PLYMOUTH ARCHITECTS AND THE CORPORATION.—The concession made by the Town Council to the local architects who were invited to send in competitive designs for the buildings to be erected in Tavistock-road and Tavistock-place did not meet the whole of the grievances. It was decided last month to increase the premium for the best design from 150l. to 250l. The architects replied to this by an expression of regret that the main point of their objection to the condition had not met with a more favourable reception. The Town Clerk was thereupon requested to ask whether, if the Special Works Committee were prepared to consider the suggestion submitted, the architects would waive their requirements in relation to the appointment of a professional assessor. To this the architects replied unanimously declining to compete unless a professional assessor was appointed. The committee resolved that the views of the architects be met to the following extent:—A professional assessor to be agreed to provided the plan to become the property of the Corporation, the premium to be successful architect to be 250l., and competitors to be instructed that the rents to be catered for are to be about 100l. per annum, with the exception of the two end sites, which are to be specially treated,

The remuneration of the assessor is to be fifty guineas. The Town Clerk is to obtain the views of the architects upon the offer as it now stands, with a view to obtaining the sanction of the committee to the selection of an assessor.—*Western Morning News.*

LIVERPOOL SCHOOL OF ARCHITECTURE AND APPLIED ART.—The annual exhibition of students' work in connexion with the City of Liverpool School of Architecture and Applied Art was opened on the 11th inst., in the applied art building, University College. The exhibits include architectural drawings and designs, designs in clay of figures and ornament, and modelling from the cast, life drawings, and many designs for mural decoration, friezes, panels, wall papers, &c.; several examples of brass and copper work, wrought iron and wood carving. The following is a list of prizes awarded, those for the architectural department not being settled, as the session is not yet finished:—Modeling.—Life, day: 1, G. A. Williams; 2, C. A. Jackson. Life, evening: 1, J. H. Williams; 2, C. A. Jackson. Special figure from life: W. Wilcoxon. Special ornament from cast: R. Murray. Design in clay competition: 1, J. Griffiths; 2, G. A. Williams. Term's work: 1, T. Rowan; 2, T. Evans. Drawing and painting.—Figure from life, day: G. A. Williams; evening, H. Carr. Set of designs, day: E. Jackson and H. Lister; evening, G. Behrend. Drapery: R. P. Roberts. Design of ornament day: J. H. Williams; evening, 1, C. A. Walker; 2, M. Collins. Wood-carving.—Term's work: 1, F. J. Stephens; 2, J. Nicholas; 3, L. Cheetham. Wrought iron.—Term's work: 1, G. H. Vogt; 2, W. Hawthorne. Brass and copper.—Term's work: 1, C. E. Thompson; 2, H. Eckstein; special, E. C. Woods. Furniture construction.—Term's work: F. H. Keeling, H. Tapsell, H. Davies, and J. W. Jones.

DISTRICT SURVEYORS' ASSOCIATION.—The members of this Association dined together on the 14th inst. at the Café Royal, Regent-street. The chair was taken by Mr. Gundry, the President of the Association, supported by Messrs. Tabberer, Waller, Payne, Carrist, Chester, Collins, Crow, Elkington, C. J. Hayward, Hardcastle, Lovegrove, Marsland, McDonnell, Nodley, Spiers, Tanner, A. J. W. Godfrey, of the Solicitor's Department; and Mr. T. W. Wheeler, Q.C., and Mr. W. Emerson, hon. sec. of the R.I.B.A.

LISKEARD CHURCH TOWER.—The response to the petition of the vicar and churchwardens of Liskeard for a faculty from the diocesan authorities, to enable the dilapidated tower of the parish church to be rebuilt, was received on the 11th inst. It will appear from it that the diocesan authorities have consented to permit the rebuilding of the tower of Liskeard Church, but we learn that a somewhat stringent condition is attached. In a letter from the Registrar, which accompanied the citation, the following passage occurs:—"The Chancellor will make it a condition of granting the faculty that the work is not to be commenced until at least 2,500l., including the legacy mentioned in the petition, has been received or promised." This condition, the Registrar adds, is in accordance with the practice of the Chancellor's Court.—*Western Morning News.*

THE WESTFIELD SCHOOL CONTRACTS, ABERDEEN.—Sheriff Mitchell heard parties in the Aberdeen Sheriff Court recently in the action at the instance of Messrs. Pringle & Slessor, builders, against the Aberdeen School Board for 600l. in respect of alleged breach of contract by the defendants in connexion with the erection of Westfield School. The question before the Court was whether or not the pursuers' statements of loss and damage were definite and sufficient enough to be allowed to go to proof. Mr. A. Knox, for the defenders, held that the case should go to proof, but before that was done he was entitled to get something more definite as to the items of loss, and how the 600l. claimed for was made up. Of course, he reserved, meantime, the question of whether or not there was a breach of contract, though defenders maintained that there had been no such breach. Mr. G. R. Cowie appeared for the pursuers, and said he declined to give further specification of damage. He understood that the case was to go to jury trial, and it would be for the judge then to say whether the damage attempted to be proved was relevant or irrelevant. His prophecy in respect to the case was that the School Board would pay up, as they had already offered so much. The Sheriff took the case to a *avizandum*.—*Aberdeen Weekly Free Press.*

PARIS EXHIBITION OF 1900.—The Royal Commission are now prepared to circulate information respecting the Exhibition. The classification and rules for exhibitors, together with forms of application for space, can be obtained by applying to the Secretary of the Royal Commission, Paris Exhibition 1900, St. Stephen's House, Westminster, S.W.

CARPENTERS AND JOINERS.—The June report of the Amalgamated Society of Carpenters and Joiners states that the only feature of interest in the work of the last month was the continued success which had attended the efforts of the members to effect satisfactory settlements of their trade movements. From a large number of English towns reports of

increased wages and other improvements had been received. No fewer than nineteen branches sent in resolutions bearing on the question of federation. In every case strong disapproval of what is known as "the official scheme" is expressed, and the trend of opinion is decidedly in favour of having a ballot on the various schemes now before the country, and not for or against the official scheme alone. The majority of the branches state that they are in favour of the "Clarion" scheme, or alternatively some scheme including the benefits which in their opinion it would confer on the workmen.

FOREST GATE, AND UXTON PARK.—Messrs. Tuckett & Son offered by auction the "Princess Alice Hotel," Romford-road, on the evening of Thursday, the 9th inst., a further portion (being their fourteenth sale) of the Plush Hill estate, belonging to the trustees of the late Mr. John Gurney, comprising ninety-six lots in Halley-road, including 120,000 sq. ft. of land, 721 10s. per lot, and thirty-six shop lots in Red Post-lane, which made from 105s. to 115s. per lot. The whole of the 123 lots were disposed of for a total closely approaching 10,500l. This result shows a marked appreciation in values consequent upon the rapid development of the neighbourhood. The auctioneer had been the first to prove, that the bounding lines of the Gurney estate, and hundreds of houses have been built and occupied, and many more are in course of erection.

HONORARY DEGREES AT CAMBRIDGE.—On Wednesday honorary degrees were conferred at Cambridge upon a number of distinguished persons, including J. E. Poynter, P.R.A., and Mr. F. C. Penrose, M.A., F.R.S., Mr. Penrose, Honorary Fellow of Magdalene College, late President of the Royal Institute of British Architects, and first Director of the British School of Archaeology at Athens, was welcomed back to his University as one of those who take part in Mathematical Tripos of 1842, and who had thrice rowed in the University Boat race some seven and fifty years ago. He had next been sent by Cambridge to travel in Italy and Greece, and had published the results of his researches in an important work on the "Principles of Athenian Architecture." He had been the first to prove, that the bounding lines of the columns and architrave of the Parthenon were not straight but slightly curved. He had recently spent much ingenuity on his inquiry into the orientation of Greek temples. He had also been surveyor of the fabric of St. Paul's Cathedral, and was probably the only man living who had stood not only on the summit of St. Paul's, but also on that of the Olympium at Athens. "Viro ad tanta altitudinem evecto non sine reverentia quidam in hoc templo honoris lauream nostrum latet decernimus."

PUBLIC IMPROVEMENTS IN MANCHESTER.—On the 3rd inst. Mr. George W. Willcocks held an inquiry at the Town Hall, Manchester, on behalf of the Local Government Board, into the application of the Corporation for sanction to borrow 6,000l. for the execution of a scheme for providing new dwellings for persons residing in certain houses proposed to be taken down. Mr. T. Hudson (Deputy Town Clerk) appeared on behalf of the Corporation, and amongst those present was Mr. Meade (City Surveyor), and other officials. Mr. Hudson said the object of the inquiry was to deal with the obligation of the Corporation to make provision for the accommodation of persons of the labouring class who had been displaced, or would be displaced, by the carrying out of certain public improvements. The houses were in Miller-street, Shudehill, Moston-lane, and Grey-street, and they were twenty-two in number. The Corporation proposed to erect the same number of houses in Miles Platting. Each house would contain three rooms up and three rooms downstairs. They were estimated to cost 205l. each. There was no opposition.

THE NEWCASTLE BUILDING TRADES EXCHANGE, LIMITED.—In March last reference was made to a proposal to establish a builders' exchange in this district. Now the project is an accomplished fact, and an institution under the title of the Newcastle, Gateshead, and District Building Trades Exchange, is being carried on by a limited liability company. The list of subscribers is an influential one, and the executive appears to be representative of all the branches of the building trade. Rooms have been secured at 62, Grainger-street. Certain parts of the premises will be set apart as sample rooms, to enable merchants and others to exhibit their goods. The company was registered on April 28 with a capital of 10,000l. in 11 shares; but it is only proposed to issue about 500 shares, as that number will be sufficient in the meantime to provide working capital. Nearly 350 of these shares have already been taken up, and the membership is over eighty.—*Newcastle Journal.*

MEMORIAL TO THE LATE DEAN VAUGHAN, LLANDAFF CATHEDRAL.—An appeal is made for contributions towards a sum of 300l., supplementary to the 500l. already subscribed, for the erection of a memorial to the late Dean Vaughan. We gather that it will take the form of a recumbent effigy, to be sculptured by Mr. Goscombe John.

ST. HILDA'S SETTLEMENT, SHOREDITCH.—We understand that Mr. Philip Day, as honorary architect, prepared the plans and designs for a building, to be known as "St. Hilda's," for purposes of the Home established and maintained by a guild of past members of Cheltenham Ladies' College. The

house provides apartments for sixteen ladies, and the furniture was designed by the Arts and Crafts Society, of Essex House; it occupies the site of the "Old Jago," in Nichol-street. The Settlement, whose work is not limited to a particular parish, was originally established in 1892 at Mayfield House, Bethnal Green, in association with some ladies from Oxford; the latter section removed to a separate Home, St. Margaret's, and the Cheltenham ladies, having to vacate Mayfield House, raised a sum of 4,000l. for St. Hilda's, which was opened recently.

RELIEF MAP OF LONDON AND SUBURBS.—Mr. E. Stanford sends us a "Geological Model of London and the Suburbs," in other words a map in relief of the surface of London and the surrounding district, to the extent of 320 square miles. The map is on a scale of 1 in. to a mile horizontally, and 1 in. to 1,000 ft. vertically; it is coloured to show the surface formations, and is accompanied by a contour section on one margin, and some sections of strata at different borings on the other margin. The geology has been compiled from maps of the Geological Survey. The model was originally made in contours of cardboard, and was reproduced by Messrs. Huntley, Bourne, & Stevens, of Reading, in thin lined steel plate. It forms an exceedingly useful explanatory model of London and the district around.

BISHOPSWOOD, HEREFORDSHIRE.—This property will be offered for sale at the Mart on the 23rd inst. It is distant five miles south from Ross, in the parishes of Ruarden and Walford—the Walcott or Welsh, ford from Goodrich across the Wye, and overlooks the vale of that river. The property, extending over 2,000 acres in all, in the midst of woodlands, hills, and rocks, was formerly a demesne of the Bishops of Hereford, and a preceptory of Flanesford Priory founded near Goodrich Castle by Richard, Lord of the, in 1347 for reasons related in St. Augustine. The Foleys established in Bishopswood, temp. Charles II., blast furnaces for casting pig-iron, which were ultimately sold by Thomas, second Marquis of Bath, in 1801, to William Partridge; he and his brother John were leading iron-masters in the country. The latter's son, John, built the house in 1829, which was extensively restored after a fire about twenty-five years ago, and now belongs to Mr. H. L. Blundell McCalmont, M.P. The house contains in the central hall a gallery and a staircase removed by Mr. McCalmont from the old Manor House, Wandsworth. The staircase, illustrated in our issue of August 24, 1886, has carved oak spiral balusters, with newels in the shape of fluted Corinthian columns, and a carved oak paneled wall dado, the panels being framed in Corinthian pilasters. The carving is attributed to Grinling Gibbons, as is also the wood screen from the foot of the staircase, which is now in the billiard-room at Bishopswood. On January 8, 1891, were sold for about 470l. the materials (timber included) of Wandsworth Manor House, which, it appears, was built for one Peter Paggen, *ob.* 1720. The design has been ascribed, but without authority, to Wren, whilst many aver that it formed the home, during several years after her marriage, of the Princess, afterwards Queen, Anne.*

CAPITAL AND LABOUR.

THE BRADFORD BUILDING TRADE.—On the 6th inst. a settlement was effected of the dispute which has existed for some weeks between the masters and men in the joinery branch of the building trade. A meeting of the masters was held in the Stone Exchange, and simultaneously a meeting of the men took place at the Dyers' Club-rooms, Barry-street. The masters re-announced their decision arrived at previously to offer the men the increase of wages of one halfpenny per hour, which was demanded, on condition that the demand for a shortened day's work in winter was withdrawn. This offer of a compromise was submitted to the men's meeting, and accepted, and a deputation proceeded to the Stone Exchange and informed the masters of the decision. The new rules of work were then signed. On the 9th inst., at the Bradford Builders' Exchange, a meeting was held to consider a circular from the Lancashire and Cheshire Building Trades' Employers' Federation, in which the stone merchants of Bradford and district and the Yorkshire Builders' Federation were asked to co-operate with the builders in Lancashire and Cheshire against the masons, who are now on strike in those counties. It appeared that masons are now on strike to prevent sawn or worked stone from being imported from Yorkshire into Lancashire and Cheshire. Sympathy was expressed with the request contained in the letter, and the Bradford secretary was instructed to write asking for a complete list of federated employers and stone merchants who had supplied stone to be worked in Lancashire.

BUILDING TRADE STRIKE, WEST STANLEY, DURHAM.—The masons and bricklayers in West Stanley have struck work for an advance of wages from 9d. to 10d. an hour.

STRIKE OF LABOURERS AT BLYTH, NORTH-UMBERLAND.—The masons' labourers employed at

Blyth have struck work to enforce an advance of wages from 6½d. to 7d. per hour, only one of the sixteen builders in the town having so far conceded the demand.

THE BRICKLAYERS' LABOURERS' STRIKE, SHREWSBURY.—At a meeting of the master builders of Shrewsbury, under the presidency of Mr. H. Farmer, recently, it was decided not to entertain the labourers' demands in any way. Inasmuch as the men were offered an advance of one farthing per hour before they turned out, and would not accept that concession, the offer has now been withdrawn.

STRIKE OF BERWICK PLASTERERS.—On the 13th inst., the plasterers of Berwick, after giving a week's notice, came out on strike for a rise of 1d. per hour in their wages. The men are at present paid 7d. and the masons 8d. The plasterers ask for the same rate of pay as the masons. The joiners have also asked for an advance of wages, to take effect in July.

THE BUILDING TRADE DISPUTE, NEWPORT.—A further complication in the building trades dispute at Newport has occurred, the members of the Society of Plasterers having stopped work. The ground of cessation is that the men object to imported non-city men being employed.

LEGAL.

ACTION BY A SCAFFOLDING AGAINST A CONTRACTOR FOR ALLEGED NEGLIGENCE.

THE case of *Picars v. Lovatt* came before Mr. Justice Bruce and a special jury in the Queen's Bench Division on Tuesday and Wednesday last week, it being an action brought by Frank Picars, a scaffolder, against Mr. Henry Lovatt, contractor, whose principal place of business is at Darlington-street, Wolverhampton, to recover damages for personal injuries which it was alleged the plaintiff had sustained through the negligence of the defendant. The defence was a denial that there had been any personal negligence on the part of the defendant, and that if there had been any negligence at all it had been that of a fellow servant.

Mr. Ruegg, Q.C., and Mr. John O'Connor appeared for the plaintiff, and Mr. Clavell Salter for the defendant.

The case for the plaintiff, as stated by his counsel and detailed in the evidence, was that the defendant had secured the contract for the erection of Her Majesty's Theatre, Haymarket, for Mr. Beerbohm Tree. The plaintiff was employed on the work as a scaffolder, and it was while following this occupation, on August 10, 1896, that the accident occurred which resulted in his injuries. He was some 42 ft. from the ground, splicing poles, when the scaffolding on which he was standing gave way, and he fell this distance. His right arm and right knee were cut and bruised, and two ribs of his left side were broken, and he sustained other injuries. He was picked up and conveyed to the hospital, where he was detained as an in-patient for seven days, afterwards attending the institution as an out-patient for fourteen months, whilst he was still being medically attended to by his doctor. He alleged that he still suffered from the effects of the accident, and was unable to follow any employment. The reason the scaffolding gave way, he said, was because the defendant instead of using ropes with which to splice the poles used chains. These were lacerated, and it was then impossible to detect any defect in the links. One of these chains gave way and, on being picked up, it was found that a link had been broken. It was, it was said, most unusual for a contractor to use chains instead of ropes for scaffolding purposes, for whilst the latter were reliable, the former were dangerous. It appeared that the plaintiff had instituted an action in the County Court under the Employers' Liability Act, but was non-suited on the ground that the defendant had not been served with the necessary notice within six weeks of the accident, hence the present proceedings at common law.

The defence was that there was no evidence of personal negligence on the part of Mr. Lovatt, and nothing to show that the chain which gave way was not a new one at the time it was so used in the scaffolding. As a matter of fact, it was said the chain was quite new, and no chain was ever lacerated except when it was first made. It was admitted that the defendant, in the course of his business, caused chains to be used in the construction of scaffolding instead of cords. Throughout the Midland district chains were used in all large building operations, and they had completely ousted the use of cords. They were adopted by contractors, not from methods of economy—because they were dearer than cords—but because they were safer for the workmen, enabling a scaffold to be erected which was perfectly rigid and safe in every respect.

Evidence was given on behalf of the defendant by several contractors, who stated that chains were much safer for the workmen than ropes, and that the jury eventually returned a verdict for the defendant, but expressed a hope that Mr. Lovatt would see his way to award to the plaintiff some compensation.

Counsel for the defendant said he would communicate that wish to Mr. Lovatt, and judgment was entered in accordance with the verdict.

* See the *Builder*, June 22, 1889, for Mr. S. W. Ker-shaw's paper, read to the Surrey Archaeological Society; and our "Notes" of May 11, 1889, and January 24, 1891.

26,209, S. M. Watson, Quadruplex and Multiplex Tele-
graphs, 12,205. G. M. Gown, Cramps for Use in Soldering
Lead Pipe-joints, 12,208. Royce & Claremont, Brakes and
Brake-Drums, 12,209. J. H. H. Loring, Lifting Machinery,
12,210. J. R. Wood, Varnish, 12,211. J. C. Clark and
Sons, 12,212. J. R. Wood, Varnish, 12,211. J. C. Clark and
Sons, 12,212. A. B. Brown, Teletomotor Apparatus,
12,213. Milner & Vyle, an ABC Teletomotor Transmitter,
12,214. J. H. Thayer, 12,215. J. H. Thayer, 12,215.
Gen'l, Tap or Cock for Controlling Gas Supplies to
Mains and Branches, 12,255. E. G. Sjostrand, Repro-
ducing Drawings, &c., 12,258. R. Southey, Window
Blinds, 12,259. J. H. Thayer, 12,260. J. H. Thayer,
and the like for Gas, Water, &c., 12,280. L. Gunn-
Chambers or Equalising the Temperature in Vessels or
Cooling, 12,292. H. W. Swain, a Sliding-socket Drain
Cleaner, 12,293. J. H. Thayer, 12,294. J. H. Thayer,
Water-preventer for Flushing Water-closets, &c., 12,304.
W. R. Warwick, Manufacture of Glazed Mosaic Plain,
Sgraffiato, or figures, 12,309. F. C. Keene, Air Inlet
for Automobiles, 12,310. J. H. Thayer, 12,311. J. H. Thayer,
Secondary Batteries or Electric accumulators, 12,316. C.
Parks, Appliances for Grates and the like, 12,321-3. J.
H. Thayer, 12,322. J. H. Thayer, 12,323. J. H. Thayer,
Wireless Telegraphy, 12,336. L. Lindemann, 12,337.
Grates for Decorative and Similar Purposes, 12,338. L.
Wolff, Grain Elevator, 12,342. J. Hubbard, Winding
Drum, 12,344. J. H. Thayer, 12,345. J. H. Thayer,
Lamps, Panels, &c. Blocks, 12,348. Saxby's White Lead
Syndicate and H. G. Percival, White Lead, 12,353.
Hansen & Frimand, Safety Locks for Doors, 12,350. Harker
& Co., 12,351. J. H. Thayer, 12,352. J. H. Thayer,
Combined Sketching Box and Easel, 12,356. J. Cook,
Opening Shaft and Works Inwardly, 12,378. S. H. Adams,
Fire Beds and Fireplaces connected therewith, 12,382. S. H. Adams,
Fire Beds and Fireplaces connected therewith, 12,382. S. H. Adams,
Hot Water, 12,385. G. Tomkinson, Window Shaft Fast-
eners, 12,408. H. Blackburn, Ventilating, Disinfecting or
Cooling Apparatus, 12,412. J. H. Thayer, 12,413. J. H. Thayer,
Furniture, 12,414. J. H. Thayer, 12,415. J. H. Thayer,
Staircases, &c., 12,420. J. H. Thayer, 12,421. J. H. Thayer,
Switches, 12,431. E. Burden, Gas or Oil Flows, 12,438.
M. Kallmann, Leakage or Current-Escape Indicator
for Electric Apparatus, 12,439. J. H. Thayer, 12,440.
Apparatus, 12,441. Barraclough & Co. and others, 12,442.
for other Piping and Joints together, 12,464. A. W.
Cameron, Smoke Consuming Apparatus, 12,470. B. B.
Cameron, 12,471. J. H. Thayer, 12,472. J. H. Thayer,
Tanks, 12,495. T. J. Somerville, Prepayment Mechanism for
Gas and other Fluid Meters, 12,530. F. Ferracuzzi,
12,539. J. Duckett & Son, and another, Water-Closets,
Machines, 12,537. R. W. Oughton, Brackets, 12,543.
T. F. Richards, Drying Apparatus, 12,546. J. B. Pear-
son, Combined Rack, Apron and Shower, 12,548. Castle
Steele, 12,549. J. H. Thayer, 12,550. W. R. Warwick, 12,551.

Water-tube Steam Boilers, 12,550, T. P. Purcell, Portable Fire Escapes and Aerial Ladders, 12,550, A. J. Wilton, for Arresting and Collecting Sparks, &c., issuing from Chimneys, 12,551, L. E. Wood, Map Holder, 12,550, Fawcett, Brettle & Co., and C. A. Matthey, Electric Motors and the Transmission of Power therefrom, 12,557, R. M. Mark, Protectors, 12,559, J. & F. Ward, Straining Wire in Fences, &c., 12,575, C. H. Forester and others, Fire Extinguishers, 12,580, F. & S. Chiesman, Conductors for Electric Cables, 12,588, C. P. Mayer, Automatic Gas-venting Apparatus, 12,592, J. Hunt, Obtaining Decorative Effects for Theatres and other Places, 12,597, F. T. Giles, Cast Nails, Screws, &c., having Spiral or Twisted Shanks, Stems, or Prongs, 12,598, Hulburd & Hall, Flanked Joins for Pipes and Tubes, 12,601, H. A. Hobson, a Deodorising Disinfecting Agent, and a Purifying Agent for Water Sewage and other Foul Liquids, 12,605, Durrant & Dunn, Draining Machines.

SOME ESTATE SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

May 25.—By NEWLAND, DAVIS, & HUNT
Carlton, Monmouth.—"Pill Bach Farm," 66a, 2 r. 28 p. f. 43,700
Undy, Monmouth.—Two freehold houses and 5a, 2 r. 28 p. f. 645
Various enclosures of land, 26a, 2 r. 1 p. f. 1,805
Redwick, Mon.—Various enclosures of land, 33a, 2 r. 28 p. f. 1,575
Wolvesson, Mon.—"Coarn Farm," 74a, 2 r. 28 p. f. 630
Calidicot, Mon.—"Ivy Lodge," f. 250
Two freehold cottages, 2 r. 28 p. f. 250
May 26.—By C. RAWLEY CROSS & CO. (at Ealing)
Ealing.—10 and 11, Alacross-rd., u.t. 96 yrs., g.r. 106, f. 750 8s.
Belvedere, Kent.—Abbeey-rd., a freehold building estate, area 6a, 3 r. 7 p. f. 2,250
Ruslip, Middx.—A freehold house, orchard, and land, 2a, 3 r. 33 p. f. 440
By HAMPTON & SONS (at Portsmouth).
Fareham, Hants.—"Claydon Farm," 42a, 2 r. 11 p. f. 1,110
"Furze Hall Farm," 30a, 3 r. 29 p. f. 1,850
An enclosure of land, 6a, 0 r. 21 p. f. 549
Three enclosures of land, 22a, 2 r. 6 p. f. 750
By WATERS & RAWLANCE (at Marlham).
Marlham, Dorset.—"Cross Tree" and "Pope's" f. 6,750
Stratbridge, Dorset.—"Grove Farm," 22a, 2 r. 11 p. f. 3,300
Margaret Marsh, Dorset.—"Church Farm," 132a, 2 r. 28 p. f. 2,850
A plot of pasture, 3a, 3 r. 33 p. f. 350
By BAXTER, PAYNE, & LEPPER (at Bromley).
Bromley, Kent.—Shawfield Pk., nine plots of building land, f. 1,435
May 27.—By COCK & BIRMINGHAM (at Bishopstrop, Devon).—"Haylake Farm," 61 a. f. 1,100
By KAY & SONS (at High Wycombe).
High Wycombe, Bucks.—53 and 64, Debenhams-rd., f. 215
6 to 9 Spread Eagle Yard, f. 294
Weymouth, Dorset.—Land, six freehold cottages, f. 315
May 28.—By Messrs. SPELMAN (at Norwich).
Hellsdon, Norfolk.—Nine plots of land, 64 a. 1 r. 15 p. f. 2,845
Four freehold cottages and 3 a. 1 r. 7 p. f. 575
Two freehold houses and 10 a. 1 r. 14 p. f. 700
By NATHANIEL FAYLER (at Worcester).
Droiton, Wore.—Freehold plantations and woodlands, 114 a. 0 r. 11 p. f. 1,800
Ludham, Norfolk.—Six houses, wheelwright's shop, &c., f. 251
By MOORE & SONS (at Gloucester).
Queadley, &c., Glos.—"Upper Green Farm," 82 a. 2 r. 20 p. f. 5,100
By NATHANIEL FAYLER (at Worcester).
Wichenford, Worcester.—"Colkett's Farm," 90 a. 3 r. 29 p. f. 1,400
May 29.—By A. C. HOGES (at Weymouth).
Weymouth, Dorset.—"The Radpole Spa Estate," 9 a. 0 r. 7 p. f. 2,500
By CUMBERLAND & HOPKINS (at Leighton Buzzard).
Leighton Buzzard, Beds.—17, North-st., f. 450
1, Mill-rd. and two cottages, f. 340
"The White House," and 1 a. 0 r. 37 p. f. 2,250
Hockley-st., &c., two plots of land, 3 a. 1 r. 33 p. f. 2,650
Back-lane, a freehold house, f. 200
Plantation-rd., four cottages and 3 a. 0 r. 36 p. f. 780
Heath-rd., "The Travellers' Rest" b. & h., and 2 a. 0 r. 36 p. f. 780
Heath-rd., 12 cottages and 1 a. 2 r. 25 p. f. 570
Heath-rd., &c., four plots of land, f. 238
Heath-rd., &c., six enclosures of land, 11 a. 1 r. 9 p. f. 950
Heath-rd., a freehold house and 6 a. 0 r. 13 p. f. 770
Hockley-rd., garden and pasture land, 14 a. 0 r. 36 p. f. 550
Union-st., "The Leys Pasture," 2 a. 0 r. 27 p. f. 165
Heath and Reach, a freehold house, and 0 a. 0 r. 2 p. f. 205
Ivinghoe, Bucks.—Two freehold houses, f. 170
June 1.—By H. J. BROMLEY.
Norwood, Kent.—"The Radpole Spa Estate," 82 a. 2 r. 45 p. f. 470
By C. H. BROWN.
Pimlico, 32, Bessborough-place, u.t. 28 yrs., g.r. 164, 40 p. f. 350
75, Grosvenor-rd., u.t. 33 yrs., g.r. 61, 40 p. f. 651
By DANN & LUCAS.
Wilmington, Kent.—"Perry Field," 10 a. 0 r. 25 p. f. 900
By P. & G. GREEN.
Brixton.—86 and 88, Raiton-rd., u.t. 71 yrs., g.r. 106, f. 651

Southwark.—68, St. George's-rd., u.t. 49 yrs., g.r. 254, f. 651
By NOKES & NOKES.
Somers Town.—23, Hampden-st., and 150, Osulton-st., u.t. 28 yrs., g.r. 185, f. 851
Bethnal Green.—246, Old Ford-rd., u.t. 55 yrs., g.r. 71, f. 426
Plaiestow.—160, 164, and 165, Grange-rd., f. 6,000
By MINGERS, KINGS, & WOODS.
Kenington.—Earl's Court-gardens, f.g.r. 501, reversion in 53 yrs.
Earl's Court-gardens, two peppercorn ground rents, reversion in 53 yrs.
1 and 2, Earl's Court-gardens, u.t. 52 yrs., g.r. 104, f. 1051
Chelsea.—309, Spynie-rd., u.t. 114 yrs., g.r. 44, f. 501
By THOMAS WOODS.
Hounslow, Middx.—1 to 4, Trinity-ter., f. 1,841
1 to 19, Pownall-gardens, f. 1,493
Pownall-rd., three plots of building land, f. 305
By WING & SONS (at Cranbrook).
Cranbrook, Kent.—"The Willey Found Land" and cottages, 17 a. 1 r. 24 p. f. 1,220
Benenden, Kent.—"Bowles Farm," 41 a. 3 r. 31 p. f. 700
A freehold cottage, 2 r. 10 a. 0 r. 28 p. f. 500
"Frog's Hole Farm," 18 a. 1 r. 7 p. f. 500
By A. DOWELL (at Edinburgh).
Colmeston, Ayrshire.—The Estate of Arncliffe, 7,791 a. 33,500
The Estate of Drumlantra, 6,038 a. 33,500
Farm of High Altitude, 161 a. 2,425
Leytonstone.—1 to 11 (odd), Rookwood-ter., f. 1,800
Leyton.—139, High-rd., u.t. 81 yrs., g.r. 54, 158, 40 p. f. 315
Forest estate, 415
By C. RAWLEY CROSS & CO. (at Shepherd's Bush).
Shepherd's Bush.—9 and 11, Bloemfontein-rd., u.t. 82 yrs., g.r. 116, f. 750
Kenington.—Rockley-rd., "York House," f. 1,201
1201, Hill-rd., u.t. 81 yrs., g.r. 191, Portobello-rd., u.t. 70 yrs., g.r. 304, f. 935
By EDWARD BOND (at Princes Risborough).
Ashted, Bucks.—A freehold estate comprising 37 a. 2 r. 15 p. f. 1,820
By G. B. HILLIARD & SON (at Romford).
Dagenham, Essex.—Enclosures of land, 4 a. 3 r. 0 p. f. 500
Two plots of building land, 2 a. 0 r. 33 p. f. 330
By F. PITTIS & SON (at Niton).
Niton, Isle of Wight.—"Puckwell" and "Lock's" two enclosures of land, 18 a. 3 r. 2 p. f. 410
"Lower Common Field," 7 a. 2 r. 2 p. f. 400
By SIMMONS & SONS (at Maidenhead).
Waltham, Berks.—Enclosures of land, 13 a. 0 r. 1 p. f. 270
White Waltham, Berks.—"Buck Farm Copse," 4 a. 2 r. 22 p. f. 180
Various enclosures, 2 a. 1 r. 15 p. f. 1,430
Binfield, Berks.—Two enclosures of land, 13 a. 1 r. 6 p. f. 350
"Vates Farm," 11 a. 0 r. 39 p. f. 500
An enclosure of woodland, 1 a. 0 r. 28 p. f. 500
By G. B. HILLIARD & SON (at Romford).
Dagenham, Essex.—Church Elm-rd., an enclosure of market garden land, 4 a. 0 r. 1 p. f. 500
Vicars-rd., &c., two plots of building land, f. 330
June 2.—By LEARD, FRENCH, & LEARD.
Brixton.—38, Gresham-rd., u.t. 65 yrs., g.r. 106, f. 460
By DUNN, SOMAN, & COVERDALE.
Highbury.—1, Highbury-ter., area 12,250 ft. f. 3,000
East Crispin, Sussex.—Lingfield-rd., 24 a. 0 r. 1 p. f. 500
House, f. 1, 400
By JONES, SON, & DAY.
Limehouse.—40 to 45 (even), Copenhagen-pl.; also "Coppen" and "Lingfield" f. 1, 400
215, 45, 106, 108, and 109, Salmon-lane; also 4, 6, and 8, Copenhagen-pl., u.t. 37 yrs., g.r. 354, f. 214, 121
By DUNN, SOMAN, & COVERDALE.
Mile End.—121, Sidney-st., with range of stabling, f. 1, 400
Upstart, Kent.—121, Sidney-st., with range of stabling, f. 1, 400
By LEVENS, SON, & HOARE.
Beckenham, Kent.—Brackley-rd., "Brackley House," u.t. 53 yrs., g.r. 341, 108
By MARK LIELL & SON.
Forest Gate.—6, Osborne-rd., u.t. 78 yrs., g.r. 61, 126, 0 r. 361
26, Clarendon-rd., u.t. 78 yrs., g.r. 84, 88, f. 400
By C. C. T. MOORE.
Alldgate.—4, 6, 10, 12, and 20, Newnham-st., and 2, Tenter-st. West, u.t. 31 yrs., g.r. 212, 158
Victoria Pk.—53, Approach-rd., u.t. 53 yrs., g.r. 64, 42, f. 2,550
Buckhurst Hill.—Epping New-rd., f. 1, 501
Stag-lane, Stag Lodge, u.t. 97 yrs., g.r. 41, f. 450
By C. C. T. MOORE.
Buckhurst Hill.—Epping New-rd., f. 1, 501
1 and 2, Melrose Villas, f. 601
By NEWBORN, EDWARDS, & SHEPHERD.
Bermondsey.—73 and 74, Southwark Park-rd., u.t. 31 yrs., g.r. 106, 164, f. 741
1 and 13, Ambrose-st., u.t. 40 yrs., g.r. 71, f. 400
Finley-rd., 4, South-st., a perpetual lease for 114 yrs., f. 215
Crouch End.—184 and 186, Park-rd., u.t. 82 yrs., g.r. 121, 123, f. 651
By STYRON & SON.
Clapham.—12, Leathwaite-rd., u.t. 83 yrs., g.r. 81, f. 401
Brixton.—232, 235, and 237, Brixton-rd., u.t. 10 yrs., g.r. 121, 123, f. 481
384, Brixton-rd., u.t. 274 yrs., g.r. 74, 158, f. 651
By NEWBORN, EDWARDS, & SHEPHERD.
Brixton.—232, 235, and 237, Brixton-rd., u.t. 10 yrs., g.r. 121, 123, f. 481
95 and 111, Gresham-rd., u.t. 54 yrs., g.r. 136, f. 651
Old Kent-rd.—66 and 74, Avondale-sq., u.t. 57 yrs., g.r. 72, f. 651
June 3.—By E. E. CROUCHER & CO.
Wood Green.—Melrose-av., f.g.r. 381, 178, reversion in 99 yrs. 1,010

By Messrs. CROOK.
Sunderidge, Kent.—Idle Hill, "Scollops Farm," 89 a. 0 r. 32 p. f. 4,180
By DOWSETT, KNIGHT, & CO.
Fulham.—80 and 86, Harwood-rd., u.t. 89 yrs., g.r. 144, 118, r. 801, f. 800
24, 25, 27, and 28, Musgrave-cres., u.t. 89 yrs., g.r. 221, 621, f. 1,660
Clerkenwell.—15 and 19, Chadwell-st., u.t. 13 yrs., g.r. 71, 105, f. 270
By PROTHROE & MORRIS.
New Malden, Surrey.—Acacia-grove, "Burlington Villa," f. 1, 400
Stratford.—Buxton-rd., f.g.r. 41, reversion in 69 yrs., f. 116
53, 59, 70, and 72, Buxton-rd., f. 1, 901
125, 127, 129, and 131, Leyton-rd., f. 1, 901
Forest Gate.—55, Clarendon-rd., u.t. 78 yrs., g.r. 81, 168, f. 630
By REVNOOLDS & EASON.
Twickenham.—18 and 19, South-rd., u.t. 50 yrs., g.r. 41, f. 420
By NEWBORN, EDWARDS, & SHEPHERD.
Tottenham.—55 to 57 and 59 to 61 (odd), Seven Sisters-rd., u.t. 78 yrs., g.r. 961, f. 3,110
603 and 605, Seven Sisters-rd., u.t. 78 yrs., g.r. 111, 113, f. 370
607 to 611 and 625 to 631, Seven Sisters-rd., u.t. 80 yrs., g.r. 561, f. 1,670
2 to 18 (even), Elizabeth-rd., u.t. 80 yrs., g.r. 310
3 to 11 (odd), Elizabeth-rd., u.t. 78 yrs., g.r. 251
2 to 11, Station-rd., u.t. 80 yrs., g.r. 401, f. 1,470
1 to 10, St. George's-rd., u.t. 78 yrs., g.r. 1,070
11 to 27, St. George's-rd., u.t. 83 yrs., g.r. 661, f. 1,940
23 and 24, St. George's-rd., u.t. 80 yrs., g.r. 365
2, 4, and 6, Culver-rd., u.t. 80 yrs., g.r. 131, 108
1 to 19 and 23 to 41 (odd), Culver-rd., u.t. 78 yrs., g.r. 1051, f. 2,410
44 to 88 (even), Russell-rd., u.t. 80 yrs., g.r. 801, f. 3,060
2 to 20, Garfield-ter., u.t. 80 yrs., g.r. 661, 108
13 and 14, Station-rd., u.t. 80 yrs., g.r. 81, f. 1,120
Culver-rd., a plot of building land, f. 200
Elizabeth-rd., two plots of building land, f. 1,900
Newington-rd., a block of building land, f. 1,300
Notting Hill.—21, Kensington Pk.-rd., u.t. 64 yrs., g.r. 151, f. 310
1 and 11, Colindale-mews, f. 1, 541, f. 785
By W. BROWN & CO. (at Bromley).
Little Missenden, Bucks.—Enclosures of meadow land, 9 a. 2 r. 1 p. f. 900
By BROWN & CO. (at Bromley).
Littleport, Cambs.—Enclosures of free land, with a cottage, area 55 a. 0 r. 30 p. f. and c. (in lots) f. 1,975
By ROOPE & WINTERS (at Koss).
Sollershope, Hereford.—"Rugdon Farm," 12 a. 2 r. 23 p. f. 590
By S. ALDRIDGE & SONS (at Weymouth).
Weymouth, Norfolk.—"The Dene House Estate," area about 2 acres, f. 4,000
By FRANKLIN & SON (at St. Bartfield).
Great Bartfield, Essex.—"The Place Farm," 12 a. 0 r. 1 p. f. 2,500
Enclosures of land, with buildings thereon, 12 a. 1 r. 23 p. f. and c. 710
Various enclosures, 9 a. 3 r. 30 p. f. 710
Great Bartfield Board Schools, f. 420
Freehold Buildings and Yard (formerly the Gas Works) f. 160
Various Houses, Cottages, and Tenements, f. 2,181
"Sand Pit Field," 3 a. 2 r. 38 p. f. and c. 130
"South Lodge" and 4 a. 2 r. 7 p. f. 925
Four cottage tenements, f. 352
By WYATT & SON (at Selsey).
Selsey, Sussex.—West-st., a plot of land, f. 180
West-st., four freehold cottages, f. 590
By W. H. SWINER & WINTERS (at Bristol).
Wington, Somerset.—A freehold house and 18 a. 0 r. 31 p. f. 900
Enclosures of land, 25 a. 0 r. 38 p. f. 625
By W. H. SWINER & WINTERS (at Bristol).
Blagdon, Somerset.—Four enclosures and 19 a. 1 r. 9 p. f. 800
June 3.—By DOUGLAS YOUNG & CO. (at Worthing).
Worthing, Sussex.—The Grand Avenue, 21 plots of building land, f. 3,905
Valentia-rd., 20 plots of building land, f. 1,118
Down View-rd., "Natolia," "Homeleigh," and "Oedenburg," f. 2,400
June 4.—By HOLLIS & WEAIR (at Ilkley).
Ben Rhidding, Yorks.—"Ploverfield," and 14 a. 0 r. 3 p. f. 5,800
By WOODS & CO. (at Northampton).
Harpole, Northants.—A freehold farm, area 95 a. 2 r. 13 p. f. 2,250
"Cory's Enclosures," 21 a. f. 1,000
June 5.—By W. A. BLANCKMERE.
Hornsey Rise.—Hazelville-rd., f.g. 341, reversion in 31 yrs. f. 610
By W. ROUSE.
Oxford-st.—No. 36a, City Leasehold, g.r. 21, f. 2501
"The Clarendon" p. h., City Leasehold, g.r. 41, f. 7,900
By C. & F. RUTLEY.
Caterham, Surrey.—War Coppice-rd., a freehold building site, area 3 a. 2 r. 16 p. f. 280
By Messrs. FOSTER (on the premises).
Hyde Pk.—110, Gloucester-st., u.t. 414 yrs., g.r. 301, f. 1,125
By HERRICK & SONS (at Bradford).
Baldon, Yorks.—"The Baldon Broom Mills Estate," area 24,767 yds. f., including motive power machinery, &c. 10,000
By C. F. MOORE (at Cirencester).
Duntisbourne Abbotts, Glos.—A freehold farm, 47 a. 1 r. 5 p. f. 570
A freehold cottage and 2 a. 3 r. 0 p. f. 115
Hankerton, Wills.—"Clovelly End Farm," 8 a. 3 r. 8 p. f. 1,700
June 7.—By HAWES & CO.
Merton.—1 and 2, Ivy Cottages 16 to 14, Merton Road, f. 1,110
By DEERHAIN, TEWSON, & CO.
Aston Clinton, Bucks.—"The Mount," also a cottage residence, f. 1,325
By ELLIS & SON.
City of London.—21, Water-lane, area 530 ft. f. 1,201
47, Eastcheap, u.t. 64 yrs., g.r. 801, f. 3,000

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Prize.	Designs to be delivered.
Additions to Schools, Thornhill	Rotherham Sch. Bd.	150. 100.	June 30
Children's Home, & near Lowest	Notford & Loughland	Not stated	July 7
Office Extension, and New Register	East Riding C.C.	200. 200. 100.	July 16
Sketch Models for Right Stone	Glasgow Corp.		No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, & Supplied by.	Tenders to be delivered.
*Sand, Lime, Cement, Drain Pipes, Stone and New Paving Blocks	St. Martin in the Fields Vestry	G. Green, Town Hall, Charing Cross-rd., W.C.	June 20
Shops, Victoria Buildings	Manchester Corp.	Manchester Corp.	June 21
Sewer Extension, Jordanstown	Beifast Union	J. W. Robb, The Workhouse, Belfast	do.
Sheds, Boundary Wall, &c.	Croydon Corp.	A. Broad, Archt. 23, George street, Croydon	do.
Overhead Gasways	Wallasey U.D.C.	F. Ash, Egmont Ferry, Chester	do.
Church, Strata Florida, Cardigan	Rainham Parish Council	Butch Wells	do.
Shelter, &c. Recreation Ground	Lewisiam B. of W.	J. H. Barr, Telford-road, Rainham, S.E.	do.
*Kerbing, Channelling, &c.	Aylesbury U.D.C.	R. H. Bradford, Surv. 2, Rickford Hill, Aylesbury	June 22
Granite and Flint Road Metal	Vicar and Church-wardens	Upper Kings, Norwich	do.
Parochial Hall, St. Stephen's, Norwich	Edinburgh Corp.	A. O. Evans, Archt. Pottery, Burgh Road, 1, Parliament square	do.
Building Work, Creighton, Pontypool	do.	W. N. Colum, C.E. 1, Parliament-square	do.
Gwers, &c. Warden-crescent	do.	do.	do.
Cable Tramway Engines & Machinery	do.	do.	do.
Slope Drives and Tension Machinery, Scrubhill and Telford	do.	do.	do.
*New Kitchen and Alterations to Workhouse	Newhaven Union	Clayton & Black, 122, North-st. Brighton	June 23
Eight Houses, North Street, Bridlington	W. Battle	Bartholomew Archt. Bridlington Quay	do.
Drainage Works, Fairfield-road, Bridlington	do.	do.	do.
Road Materials	East Grinstead U.D.C.	R. White, Rury, London-rd., East Grinstead	do.
Enlargement of Inland Revenue Office, Edinburgh	H.M. Office of Works	Sec. H.M. Office of Works, Westminster, S.W.	do.
Business Premises, High-street, New Brighton	O. Ryan	Chatham	do.
Granite and Slag	Birmingham Corp.	Surveyor, Council's Office	do.
Broken Granite	Newhaven Union	Boro. Burv. Town Hall	do.
Additions to Workhouse	Edmundst. Birmingham	Edmundst. Birmingham	do.
*Sewer, Manholes and Ventilators	Hampstead Vestry	Wood Green U.D.C.	do.
*Ice Fencing	Merthyr Tydfil Union	Merthyr Tydfil Union	do.
Sewers, Tring-road, &c.	Aylesbury U.D.C.	J. E. Bradford, Surv. 2, Rickford Hill	June 24
Dining Hall and House	Merthyr Tydfil Union	1, Roderick, Archt. Clifton-street, Abercrombie	do.
*Granite Setts (8,000 tons)	Brierfield (Lancs.) U.D.C.	J. T. Landless, C.E. Nelson, Lancs.	June 25
Two Palm Semi-detached Houses, New Malden	Ripon E.D.C.	R. A. Hind, Archt. 38, Hill rd. Wimbeldon	do.
Road, Worthington	do.	W. W. Hignorth, 15, College Hill, Ripon	do.
*Cottage Hospital	Hanwell Jubilee Com.	Hanwell Council Offices, Hanwell	do.
*Repairing Two Warehouses	City of London Electric Lighting Co.	C. Thompson, 20, Graham-street, Hackney, N.E.	June 27
*Seven Cottages	Chepstow Oddfellows Society	J. E. Constanter, 30, High-st. Chepstow	do.
Chapel, Llandudno, Carnarvon	do.	J. E. Constanter, 30, High-st. Chepstow	do.
Ten Houses, Crumlington, co. Durham	do.	J. E. Constanter, 30, High-st. Chepstow	do.
*Chapel and Additional Wards at Workhouse	Bucklow Union	R. J. McEath, Blonham House, Sale	do.
*Hospital	Leicester Corp.	Blackwell & Thomson, Halford Chambers, Halford-street, Leicester	do.
*Painting and Repairs to Brickwork and Painting	Chelsea Gardians	London & Harrison, 20, Bow-lane, Chesham	June 28
*Underground Conveyance and Urinals	Southwark Vestry	O. E. Winter, Vestry Hall, Borough-road, S.E.	do.
Additions to Grain Warehouse, Chorley	Lancs. & Yorks Ry. Co.	R. A. W. Bayley, Co. Offices, Hants. Bank, Manchester	do.
Six Houses, Bala, North Wales	Asylum Committee	R. J. Jones, Archt. Mount place, Bala	do.
Quarrel Tank, &c. Beverley	Asylum Committee	W. J. Morley, Archt. 269, Bury-st. Newberg, Beverley	do.
Technical Schools, Harrogate	Winchester Corp.	City Surveyor, Guildhall, Winchester	do.
Shop, Harness Room, &c. Guildhall Yard	Befington Rural Bd.	J. C. Ode, Archt. 31, Hamilton-square, Birkenhead	do.
*Work Yard, Shed, &c. at Birkenhead	do.	J. A. Crowther, Boro. Engr. Town Hall	do.
Electric Light Station, Pine Grove	Berkhamstead U. & R.D.C.	J. Leeson, 3, Victoria-st. S.W.	June 29
*Sewerage Works	N. E. Ely Co.	Newcastle-on-Tyne	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, & Supplied by.	Tenders to be delivered.
*Guernsey Broken Granite	West Suffolk C.C.	F. Whitmore, 17, Duke-street, Colchester	June 23
*Make up and Paving Street	Fulham Vestry	C. Butterill, Town Hall, Fulham	do.
Sewerage Works, Frodham	Runcorn R.D.C.	W. Digby, Surv. Hall, Bank, Frodham	June 30
Reservoir, Marbury Down, Glam.	Barry U.D.C.	W. W. Watte, C.E. 7, North Bailey, Durham	do.
*Sewer, Engine House, Forbury Road	Alton U.D.C.	R. B. Grantham & Son, 25, Northumberland-rd., W.C.	July 1
Isolation Hospital Block	Chester-le-Street R.D.C.	W. T. Jones, Archt. 74, North Bailey, Durham	July 2
*Sewers, Tanks, Pumping Station, Boiler House, and Plant	Eton U.D.C.	W. T. Jones, Archt. 74, North Bailey, Durham	do.
*Superstructure of Asylum	L.C.C. Asylum Com.	G. T. Hines, 35, Parliament-street, E.C. 4	July 4
*Making-up, &c. Roads	Hendon U.D.C.	W. B. Hopes, Union Office, Portsmouth-road, Kingston	do.
*Offices adjoining Workhouse	Kingston Union	Leslie & Reid, Engr. 72a, George-street, Edin-	do.
Reservoir, Newbigginhill, Roslin	Midlothian Lunacy Bd.	Edin.	do.
Outfall Sewer (No. 1) Aber Valley	Caerphilly U.D.C.	A. O. Harpur, Engr. 10, Caerphilly	do.
*Public Library and other Buildings	Gloucester Corp.	Walker & Son, 17, College-green, Gloucester	do.
Large Oil Tank and Connections	Stockport Corp.	S. Secor, 10, St. James-st., Stockport	July 6
*First Section of Hospital	Metropolitan Asylum Board	A. C. Harcourt, 15, Leadenhall-street, E.C. 3	do.
*Chapel	Thingoe Union	T. A. Ackison, 85, Mary's Passage, Cambridge	do.
*Fire Engine Station	Hurnsey U.D.C.	E. J. Lovings, Office, Southwood Lane, Hurnsey	July 9
Road Metal (500 tons)	Lewes T.C.	Edinburgh Surveyor, Town Hall	July 11
*Painting at Barracks, Portsmouth	War Dept.	R. E. Office, Portsmouth	July 21
School Building, Improvement, &c.	Nottingham S.B.	Whitbread & Son, 10, Kiraly-in-Ashfield	No date
Schools and House, Kirkby	Nottingham Forest Football Club	J. F. M'Donnell, Archt. 33, Market-st., Nottingham	do.
Pavilion, Trent Bridge	Nottingham Forest Football Club	J. F. M'Donnell, Archt. 33, Market-st., Nottingham	do.
Additions to Inn, Holywood-street, Belfast	J. Byrnes	J. Byrnes	do.
Business Premises, Howland road, North Salside	Bell & Taylor	J. Byrnes	do.
Business Premises, Convent, &c. Darham	Consett Indus. and Prov. Soc. Ltd.	Consett Indus. and Prov. Soc. Ltd.	do.
Parochial House, Islandeady, Castlebar	W. O'Connell, Newcastleside	W. O'Connell, Newcastleside	do.
Additions to Registry Office, North-sidon	North Riding C.C.	W. O'Connell, Newcastleside	do.
Widening Stone Bridge, Levan	do.	W. O'Connell, Newcastleside	do.
Extension of Schools, Fallowthorpe	do.	W. O'Connell, Newcastleside	do.
Additions to Buildings, &c. Ilham	Robert, Mart, & Co.	Robert, Mart, & Co.	do.
Extension to Mill, East-street, Leeds	do.	Robert, Mart, & Co.	do.
Additions to Farm Buildings, Saxilby, Lincs.	do.	Robert, Mart, & Co.	do.
Heating work at Schools, Balgale, Lincs.	do.	Robert, Mart, & Co.	do.
Drill Hall, &c. Cross-lane, Salford	do.	Robert, Mart, & Co.	do.
Billiard Room, Library, &c. Brant	do.	Robert, Mart, & Co.	do.
Rebuilding 2nd Hotel Property, Salford	do.	Robert, Mart, & Co.	do.
Cottage Hospital, Barford, Oxfordshire	do.	Robert, Mart, & Co.	do.
Council Offices	Spilay R.D.C.	J. Loomes & Co.	do.
Factories at Bisham, Lincs.	do.	J. Loomes & Co.	do.
De-naturing Shire Hall Buildings, Stafford	Staffs. C.C.	W. H. Chaske, County Surveyor, Stafford	do.
House, Wesley-road, Arnsley, Leeds	H. Smith	C. F. Wilkinson, Archt. 35, Park-lane, Leeds	do.
Alterations, White Horse Inn, Leeds	Melbourne Brewery Co.	T. Wines, Archt. 92, Albion-street, Leeds	do.
Alterations to Woodman Inn, Kirk-stall, Leeds	do.	do.	do.
House, 6, Colchester-rd., Salford	do.	do.	do.
Excess	W. Simmons	W. Simmons	do.
Warehouse, Junction Mills, Laster-dike	do.	do.	do.
Blacksmith and Machine Shop, Laster-dike	J. Harrison	J. Harrison	do.
Additions to School, Abbot-holme, Derbyshire	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Surveying Assistant	Leicester Corp.	21. 5s. per week	June 21
*Surveying Assistant	do.	21. 5s. per week	June 23
*Building Inspector	Southend-on-Sea Corp.	104s. per annum	June 23
*Estimating and Measuring Assistant	London C.C.	3. 10s. per week	June 27
*Tender of Works	Stafford Union	400s. per annum	No date
*Quantity Surveyor	N. E. Ely Co.	400s. per annum	No date

Those marked with an asterisk (*) are advertised in this Number. Competition, pp. iv. Contracts, pp. iv. vi. & viii. Public Appointments, pp. xviii. xix. & xxi.

4, Gt. Tower-st., u. 39 yrs., g. r. 1904, r. 304. 108.	Fulham—41 and 43, Coomer-rd., u. 73 yrs., g. r. 74, 105, f. 64. 125.	By GREEN & SON (at Masons' Hall Tavern), Kensington—Kensington-sq., "The Greyhound" p-h, f, r. 1054.	24,500
By FULLER & FULLER.	Shepherd's Bush—Godolphin-rd., "The Athenaeum," u. 48 yrs., g. r. 282.	By ORGILL, MARKS, & ORGILL (at Masons' Hall Tavern).	
Camberwell—Clarendon-st., &c., f. 482, reversion in 28 yrs.	By WALTON & LEE.	Baywater—Bayswater-rd., "The Crown Hotel," u. 297 yrs., f. 496, with goodwill	20,860
Bethnal Green—Pereira-st., &c., c. g. r. 1961, reversion in 34 and 67 yrs.	Cheshunt, Herts.—"Churchgate," "Arlestone," and a. 31. 20. p. 5.	By R. SMITH & Co. (at Masons' Hall Tavern).	
By W. R. NICHOLAS & Co.	Norwood—59, Thurlstone-rd., u. 84 yrs., g. r. 71, f. 326.	Strand—Clare-st., "The Sun" p-h, f, and "The Fountain" p-h, u. 50 yrs., r. 1204, f. "Stan-hope-st." p-h, u. 44 yrs., r. 1004, with goodwill	33,500
Newmarket, Cambs.—Bury-rd., four plots of building land, 1 a. 3 r. 2 p. 6 f.	By W. N. WILLOUGHBY.	By SCHOFIELD, EVANS, & Co. (at Masons' Hall Tavern).	
By OSBORN & MERCER.	5 and 6, Harpenden-rd., u. 97 yrs., g. r. 154, r. 807.	Kensington—High-st., "The Crown" p-h, f, with goodwill	35,000
Hawkhead, &c., Lancaster—"The Wray Castle Estate," 830 a. r. 3 p. f.	By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).	Battersea—41 and 43, Harroway-rd., u. 79 yrs., g. r. 74. 105.	355
Crouch Hill—29, Mountview-rd., u. 83 yrs., g. r. 101, f. 637.	Charing Cross—St. Martin's-lane, "The Trafalgar" p-h, u. 44 yrs., r. 1004, with goodwill	33, 35, and 37, Yelverton-rd., u. 79 yrs., g. r. 104, f. 105.	620
By ALFRED RICHARDS.	Blackfriars—Blackfriars-rd., "The Old King's Head" p-h, a copyhold rental of 53s. 6d., reversion in 39 yrs.	19, Russell-st., u. 61 yrs., g. r. 51.	220
Waltham—Eleger Cross-rd., an enclosure of land 1 a. 1 r. 31 p. 6 f.	Covent Garden—New-st., "The Green Man" p-h, a freehold rental of 40s., reversion in 104 yrs.	36, Park-grove, u. 61 yrs., g. r. 61.	230
By J. C. PLATT.			
Hammersmith—21, Ilfrey-rd., u. 82 yrs., g. r. 61, 65, c. r. 382.			

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.

Teak, E.I., load

Sesuvium, S.E. Co.

Ash, Canada, load

Birch, do, do

Elm, do, do

Fir, Danish, do

Canada, do, do

Pine, Canada, do

Do, yellow, do

Lath, Danish, do

St. Petersburg, do

Walnut, Riga, do

Oak, do, do

Oak, crown, do

Deals, do, do

Do, 4th & 3rd, do

Do, 4th & 3rd, do

St. Petersburg, do

Do, yellow, do

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Do, white, do

Swedish, do, do

White Pine, do

Canada, Pine, do

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TIMBER (continued).

Satin, Porto Rico

Walnut, India

Iron—Pigs in Soil

Land, do, do

Bar, Welsh, in

London, do, do

Do, do, at works

In Wales, do, do

Do, Staffordshire, in

London, do, do

COPERS—British

cake and ingot

Sheet, strong, do

Chill bars, do, do

YELLOW MET. IR.

L.A.D.—Figs

Sonnah, do, do

English com.

Bands, do, do

Sheet, English

do, per sq. ft.

Do, upwards, do

Pipe, do, do

Sheet, do, do

sheer, do, do

tangle, do, do

Spelter, do, do

Do, do, do

Australian, do, do

Rasped, do, do

Rasped, do, do

Bulion, do, do

Lined, do, do

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursdays. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender, and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

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CROYDON.—For building stabling at rear of Jubilee Buildings, George-street, Mr. A. Broad, architect, 25, George-street, Croydon.

Quantities by the architect

A. Bullock

S. Page

D. W. Barker

J. Horrocks

J. Smith & Sons

EAST MOLESLEY.—Accepted for erecting a pair of semi detached villas, East Molesley, for Mr. J. A. Milner. Mr. H. Knight, architect, London.

Pater & Co.

EAST MOLESLEY.—Accepted for erecting one semi-detached villa, East Molesley, for Mr. J. A. Milner. Mr. H. Knight, architect, London.

Pater & Co.

ESHER.—Accepted for erecting five villas, Esher, Surrey, for Mr. C. C. Wylie. Mr. H. Knight, architect, London.

Wheatley & Sons

HUDDERSFIELD.—For the erection of five houses, Somerset-street, for the Oddells. Mr. J. Berry, architect, 9, Queen-street, Huddersfield.

Messrs. J. J. Capner, Almondbury.

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LONDON.—Accepted for fitting-up Bishopsgate Station Restaurant, for the Metropolitan Railway. Mr. H. Knight, architect. London.—Sage & Co. £750

LONDON.—Accepted for rebuilding the "White Lion," Upper Thames-street, for Mr. L. H. Cross. Mr. H. Knight, architect. London.—Turtle & Appleton £5750 £500

LONDON.—Accepted for rebuilding 110, Great Portland-street, W., for Sir Henry Knight. Mr. H. Knight, architect. London.—G. Chase & Son. £2400

LONDON.—Accepted for alterations, 38, Red Cross-street, E.C. for London and Midland Bank. Mr. H. Knight, architect. London.—J. Milroy £1750

LONDON.—Accepted for alterations, "Crown and Anchor," Fishbury-pavement, for Messrs. Worthington & Co. Mr. H. Knight, architect. London.—G. Kirby £1450

LONDON.—Accepted for new bay window, redrains, &c., at No. 6, Dawson-place, Pembroke-square, W. Mr. William A. Pite, architect. London.—F. T. Chisham £650

LONDON.—For repairs to be done at the Licensed Victuallers' Asylum, Asylum-road. Old Kent-road, S.E. Mr. W. F. Potter, architect. Maxwell Bros. £448 0 1 W. Croft £200 0 0
Burchin Bros. 383 0 F. Dawes, Peckham
R. J. Young 261 18 Rye (accepted) 195 0

MILL HILL (Middlesex).—For alterations to schoolroom, for the Governors of Mill Hill School. Mr. A. Bradley Rooke, architect. Quantities by Mr. E. J. Faine.—
Higgs & Hill £1661 1 1 T. Stead £103 0 0
Cowley & Drake 148 0 W. Irwin 1033 0 0
Moughton & Son 148 0 Gough & Co. 598

MOULTON (Surrey).—For the erection of three houses for Mr. W. C. Ware. Mr. H. P. Burke Downing, architect. 7, Great College-street, Westminster.—
R. S. Remond £2753 1 1 James Burgess £2072 0 0
John Garrett & Son 2388 0 G. P. & H. Barnes 2 60

PENRITH.—Accepted for the erection of Penrith Cottage Hospital. Messrs. G. Watson & Son, architects, Penrith.—
Masonry, &c.—W. Forrester £568 8 9
Joinery, &c.—J. Richardson & Son 459 13 0
Siding, &c.—J. Bailey 110 10 0
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Sir E. Burne-Jones.



THE death of Sir E. Burne-Jones leaves another great gap in the ranks of modern English painters of the first order, for such the deceased artist must be considered,

though there will be perhaps more diversity of opinion in regard to his position in art than when we had to record and regret the loss successively of Leighton and Millais. For Leighton in the main, and Millais completely, had kept their places on the broad high road of art, and appealed to the sympathies of the many. If Leighton had certain limitations in regard to colour, he was not the less recognised by artists as a great draughtsman and a great designer; if he did not conform to popular ideals in art, he was nevertheless sufficiently in touch with the public to secure its sympathy and admiration; while Millais, by far the greater painter in regard to breadth and comprehensiveness of power, was essentially a painter of the life of his own day; his methods appealed more especially to artists, the results were such as appealed to the sympathy and understanding of the public at large. Burne-Jones occupied quite a different position. He lived and painted in a world of his own, which was most certainly not the world of the British public; and though in latter days he had achieved public success, and an important work by him was a sure attraction in an exhibition, there was still a large proportion of exhibition-goers who had in their hearts little sympathy with his pictures, and rather followed a fashion than their own perception.

His art, in fact, appealed to an esoteric circle, though a pretty large one; and within that circle it has been worshipped with rather more passion than judgment. For with all its beauty, it is an art that moves within narrow limits. It was his aim to use art purely as a means of poetic expression; to escape from mere realism altogether. But there are two ways of escaping from

realism in art, in the use of the figure especially. The one is, taking the living human figure as the basis, to create from it pictured personages grander and more impressive than ordinary humanity. That was Michelangelo's way, as illustrated in his Prophets and Sibyls; figures with nothing dreamy or unreal about them; figures based on accurate and powerfully drawn human anatomy, but with a greatness of manner and expression such as is rarely if ever found in actual life. An opposite method is to stop short of the life and variety of human character and action, to subtract from the figure all living individuality, and leave it only a kind of visionary character. Michelangelo's sibyls are super-human; Burne-Jones's women and angels are rather semi-human. They have the generalised qualities of the human form, but are destitute of human vigour, character, and individuality. In this respect they are strikingly analogous to the poetic personages of his friend Morris. Burne-Jones was, we think, a greater painter than Morris was a poet (of course Morris's poetry was rather a recreation of his life than a central object), but in Morris's poems, just as in Burne-Jones's paintings, we feel that no one of the characters mentioned stands out with any dramatic distinctness; they are names in a story, but nothing more. So with Burne-Jones's women of legend or allegory; they have many different names, different draperies, and different accessories, but they are all the same woman, and that more like a dream-woman than a living one. Even his men, his knights, are only the same woman dressed up in armour or other male attire. They are totally devoid of manly force and vigour.

This may not have arisen wholly from a certain femininity of character which seems to have belonged to his genius, or from inability to pourtray more life-like figures had he been so minded; we are inclined to think that to a considerable extent it was the result of an artistic intention, a wish to keep his work within the range of ideals and away from any competition with actual life. But however we may sympathise and admire such an aim in some respects, it cannot be denied that, just as in Morris's versified tales, the result is monotonous, and that one feels a long-

ing sometimes for a little of the fresh healthy air of actual life. This is more particularly the case when we contemplate the graceful but feeble and epicene-looking figures which do duty, not only as men, but as fighting men. The knight or fairy prince in "The Briar-Rose," so far from seeming like a fresh new life breaking into the sleeping palace, is almost as much asleep as all the rest; so are the lovers in "Love Among the Ruins," an illustration of one of Browning's most passionately expressed poems—at least it takes the title and circumstance of the poem; but the figures are half asleep. We believe the artist knew perfectly well what he was doing in painting a subject thus—in fact we have seen an expression to that effect in one of his letters; he wished to preserve a certain unity and harmony of the whole conception, which would have been upset by any greater vitality in the figures. Nevertheless, we hold that the result, however beautiful, is monotonous; and when people have recovered a little from the effect of the peculiar charm of his colour and of the spiritual character of his figures, it will be felt to be so, and will lose its hold on future generations to a great extent in consequence.

What makes the greatness of Burne-Jones's art, and what will keep it alive in men's recognition, is, besides its undoubtedly ideal and spiritual character, the splendid colour and fine quality of decorative line and detail with which it abounds. As a draughtsman of the figure he was in his earlier years palpably deficient, which is not to be wondered at, seeing that he never thought of taking to painting till he was twenty-three, later than the age when most intending painters have finished their academical studies. In fact, he thought first, and wished to paint afterwards; while nearly all born draughtsmen draw first, from the pure delight in drawing and impulse towards it, and learn to think afterwards. Some of his earlier works, such as "Love Disguised as Reason" and "Demophoon," show more force and vigour of conception than we generally find in his later ones; the former is even humorous, with a very delicate kind of humour—a quality we certainly never find in the later Burne-Jones; and the latter breaks into genuine passion.

Of the maturer pictures "Chant d'Amour" will always remain his greatest work, both from its unity of conception and because in this kind of Decameron picture he found a subject exactly suited to his visionary and dream-like type of art. Some of the sacred pictures have what may be called a childish quality, such as the beautiful "Days of Creation," a pure joy in regard to line and colour, but a very weak and naïve symbolism of so great a subject. Occasionally we come on a really original and piquant suggestion, as in the case of Danæ watching her own prison-tower in course of construction, the curious eel-like dragon in the picture of Perseus, or the pretty conception of "Dawn" running through the little town clanging her cymbals; but these are rather rare exceptions to the general rule of visionary quietude.

In his perception of decorative beauty of accessories, and of drapery especially, he was one of the greatest of painters, and his paintings and drawings in this sense are a continual feast. There is no finer illustration of this than the treatment of the conventional tree which forms the background to the mosaic in the American church in Rome, while the whole picture is a fine example of that tender spirituality with which he treated religious subjects in painting, and which was obviously genuine and from the heart.

In his earlier days Burne-Jones drew a good deal for stained glass, and it was from some of his designs for glass, carried out by Morris's firm, that he first became the object of public attention. We give in this issue two reproductions of rather curious examples of these window cartoons, which have been in our hands for some time, and which we rather believe have not been before published; they are allegorical representations of "Intemperance" and "Folly," and though not equal in style to other things of his that we have published,* they have the interest of not being hackneyed, and it may be observed that they exhibit a more vigorous action and more decided character than the painter would probably have allowed himself in later years.

Burne-Jones was an example of a perfectly unworldly artist, devoted to and living for his art, in the exercise of which he carried out an immense quantity of work, especially when the delicacy of finish which he put into everything is considered. He was the most remarkable representative of a school of English art which arose during this last generation, and which has left an impress on the thoughts and tastes of the more cultivated section of English and Americans (besides a certain side influence in France) which will not soon wear out. But—following former analogies in artistic history—we doubt whether an art so strongly marked by the special bias of a school, and so deficient in variety and dramatic character, will hold anything like the same place a hundred years hence as many people are ready to accord to it at the present moment.

* The following is a list of the works by Sir E. Burne-Jones which have been illustrated in the *Builder*: Windows in South Choir Aisle, Salisbury—January 3 and 17, 1885; triplet window for Easthamstead Church—February 7, 1885; "St. Ann and the Virgin" (design for stained glass)—April 14, 1888; "The Sacrifice of Isaac" for stained glass—same issue; windows at Christ Church Cathedral, Oxford—April 27, 1888; "Christ and Mary Magdalen in the Garden" and "Mary Magdalen at the Sepulchre" (windows for Easthamstead Church)—April 4, 1886; and "The Tree of Life," for mosaic for the American Church at Rome—January 7, 1893.

THE MUSEUM OF PRACTICAL GEOLOGY:

PROPOSED ABOLITION.

IT is remarkable, now that the Museum of Practical Geology in Jermyn-street is tottering to its fall, what interest influential geologists who do not care one jot for the practical applications of geology are taking in that institution. The Geological Society, which regards the uses of geology as quite alien to its functions, has been memorialised on the subject, as will be hereafter seen. The promoters of the memorial, neither of them conspicuous for their contributions to the economic aspect of the science, loudly call attention to the fact that "The Museum was designed to contain the specimens obtained during the progress of the Geological Survey, with the special object* of illustrating the applications of Geology to the useful purposes of life." It is too late to call attention to that now. It should have been borne in mind these last thirty years. We have over and over again called attention to the circumstance that in late years but little worth mentioning has been done by the Geological Survey to further the study of Applied Geology, which has been left almost entirely to the enterprise of private individuals, and these so few in number that they can be counted on the fingers of one hand. We know perfectly well that, during the past year or two much has been made of the "engineers, architects, well-sinkers, medical officers, and . . . the general public who come for all kinds of information relating to geological matters"—and we have no doubt whatever, judging from what we can see at Jermyn-street, that a great deal of information has been given. If the officers of the Geological Survey know anything, seriously, about the practical applications of the science, why do they not write something about them? They can write enough about other aspects of geology—why not about that for which the Survey is supposed to have been specially founded?

The Museum of Practical Geology has always been so closely connected with the Geological Survey that we cannot speak of the one without thinking of the other. The Museum is a kind of reflection of the work of the Survey, and that accounts for our connecting the two, now that the Select Committee of the House of Commons has recommended that "the Geological Museum in Jermyn-street be no longer occupied for the same purposes as now, and that the collections there exhibited be removed to South Kensington."

But *where* at South Kensington? That is the point. Our contemporary, *Natural Science*, interprets the Committee's report as an intention to consign the Jermyn-street collection to the care of the Natural History Museum. We happen to know that the magazine mentioned speaks with some authority; that is why we quote it. Perhaps the wish is father to the thought—and, to a certain extent, we hope it will be. But it must be remembered that, little as Jermyn-street has done for applied geology during the past twenty years, the British Museum (including, of course, the Natural History Museum) has done less. That counts as nothing, if the Geological Department of the British Museum will undertake, on receiving

the specimens, to found a section specially dedicated to the practical applications of the science. For, up to the present time, it has been no part of the work of the British Museum to teach (by exhibition) the uses of geology from a practical point of view. The officers of that Museum are not accustomed to treat science from the utilitarian standpoint, and we trust, on general educational grounds, that it will be a long time ere that aspect of geology will be forced upon them. In other words, to consign that part of the Jermyn-street collection referring to economics to the care of the British Museum would be to consign it to oblivion.

As will be gathered from our last observation, however, there are other parts of the Museum of Practical Geology than that devoted to the practical applications of the science, and we will treat of these separately. During the progress of the Survey, immense collections of British fossils have been made. Many of these have been invested with peculiar interest by the studies of such men as Huxley, Murchison, Salter, and the elder Etheridge. These specimens, described by old masters of paleontology, are of the greatest importance to both present and future generations of scientists. We should like to see this precious collection taken care of for all time, and we know of no better place for it than the Natural History Museum, where there is a still greater amount of similar material, where it would be highly appreciated and well taken care of. Therefore, we say, let the fossils be sent to the Natural History Museum, where they stand a chance of being more satisfactorily dealt with, and the sooner the better.

We cannot discuss the point further here, however; our chief interest rests with the specimens of economic value—particularly the building stones, marbles, cements, and the like. What is to become of these?

We have shown that the Natural History Museum is hardly the place for them. The House of Commons Committee says the collections are to go to South Kensington. The only other place we can think of there is the Science Department of the South Kensington Museum. That department, however, not only has no house-room for them, but, judging from a recent view of the Treasury in regard to the contemplated completion of the South Kensington Museums, it is not probable that room could be found for them in the near future in the Science Museum.

In our opinion, the best thing that can be done with that portion of the Jermyn-street collections which is of special interest to architects, engineers, surveyors, and miners, is to let it remain where it is, but only on these conditions, viz., that it shall be more carefully looked after by being brought up to date, and that the specimens be brought to the light and effectively displayed and classified. The central position of the museum in Jermyn-street is a great convenience to professional men (who would consult it then much more frequently and with greater profit than now); it is better situated in that respect than is South Kensington. The removal of the fossils would give more room for the economic collections, and these latter in competent hands could be made much more complete.

Whether the re-constituted Jermyn-street museum should remain under the charge of

* The italics are ours.—Ed.

or in connexion with the Geological Survey is altogether another matter. That should depend on whether the Survey is able and willing to provide a sufficient number of experts in the practical application of geology to look after the collections, and write works upon them. We have had enough of the superficial nonsense such as can be seen in the appendix of many Survey memoirs; we want the economic aspect treated in as much detail and care as the purely scientific portions of the book (the lists of fossils excepted). The germ of such a band of economic geologists already exists in the Survey; the man who wrote the recent pamphlet on Soils and Sub-soils, could assuredly do more—that is the one redeeming feature of the work of the Survey in recent years from the economic standpoint. But Topley is gone for ever; Whitaker, owing to the age limit rule, we believe, has "been retired," and De Rance has left. No one on the Survey has studied building stones except in a very partial and perfunctory manner, and the collection in the Museum is very incomplete. We look in vain for official particulars as to the strength and other physical properties of even the specimens exhibited, though we may have the good fortune to unearth the results of some chemical analyses forty to fifty years old. The excellent little "guide" to the Museum says as much as it can in its small way, but each section of this requires elaboration in sympathetic hands.

It should be perfectly possible for an architect to discover in the museum any building stone raised in, or coming into, the United Kingdom, and to glean at the same time some particulars concerning the size of blocks quarried, chemical and micro-analyses, strength, &c., and a list of buildings and parts of buildings in which the stone has been used. A collection of suitable and authenticated specimens can now be made much more readily than formerly by co-operation with the Home Office, for, since the passing of the Quarries Act, Inspectors of Mines are also Inspectors of Quarries, and these could easily get the samples. The same observations apply to granite, marble, and slate. Large scale maps should also be available, specially coloured to show the locations of quarries and areas of quarriable stone.

The clay-working industry is not much advanced by the miserable show at present arranged in the Museum. Specimens of every class of brick made in the country should be available, to the number, it may be, of some thousands. A large assortment of brick-earths, with mineral and chemical composition, and the special kinds of goods made from each, with further suggestions of their uses, might be displayed. And so on with all other mineral products raised in the country. We would also include certain mineral productions of other countries for the special benefit of the would-be colonial prospector. We believe there is material for that already in the Museum; if not, it could soon be obtained.

Agriculture should be better represented; even the Japanese have done this department more satisfactorily in reference to their own country.

The qualities of different kinds of ores should be set forth; to exhibit a number of specimens of, say, copper, with a label to each merely giving locality, is not everything

that could be desired. Grades of the ore should be exposed, or available, in series, and the differences explained, if not on the labels, then in a sufficiently detailed and practical catalogue.

Questions relating to water-supply, wells, &c., should, of course, receive special attention; and that is the Survey's special economic forte at present. On a former occasion we indicated how, from the architect's and surveyor's points of view, the particulars concerning wells might be amplified to advantage in the Survey memoirs, and we shall not deal with that again at present. As we have said, the Survey is already strong on water-supply matters, though several good men have left the staff.

We will not pursue the question of the organisation of our supposed new Jermyn-street museum any further. We can only remark that we view with dismay the House of Commons Committee's recommendations to abolish the museum altogether, and we trust they will not be acted upon. The fossils, as we say, would find a more suitable resting place in the Natural History Museum, but let the specimens of more economic interest remain where they are and be intelligently added to for the greater benefit of architects, engineers, miners, surveyors and all whose work leads them to take an interest in the practical applications of geology.

DAMAGES FOR BREACH OF AGREEMENT TO BUILD.

IT is unfortunately the case that many of the contracts by which a builder agrees to take a lease of land and to erect buildings on it and then pay a rent to the owner of this land, are entered into by builders somewhat heedlessly. The result in such instances too often is that the builder is unable to fulfil his part of the agreement.

In such contracts it is usual, as many of our readers are aware, for a clause to be inserted by which it is provided that if the builder makes default in fulfilling his contract the materials on the land become the property of the owner of it, and he has a right to re-enter.

In the recent case of *Marshall v. Mackintosh*, decided on June 7 by Mr. Justice Kennedy, the important practical question was raised whether such powers given to the landlord prevent him from obtaining from the builder damages for breach of contract, and, if he can recover them, what is the principle on which the damages should be assessed.

We confess that at first sight it may appear as if a landowner, by such clauses as we have mentioned, had debarred himself from obtaining damages. But when the subject is looked at a little more closely, it is clear that the clauses referred to do not, by their language, limit the landowner's rights. It is equally clear that, if there is a breach of a contract, the man who suffers by it is entitled to be placed as nearly as possible in the same position as he was before the breach. It is no consolation to a landlord to be in possession of his land again if he has also lost money. In the case before Mr. Justice Kennedy, the builder agreed to pull down two houses in Dover-street, Piccadilly, and build on the site a new structure, which was to be erected "in carcass" before December 25, 1896, and therefrom the landowner was to grant an

eighty years' lease, for a peppercorn rent for the first year, and afterwards at a rental of 1,100*l.* a year. All that the builder did towards carrying out his contract was to remove about 200*l.* worth of old materials from the buildings, and in January, 1897, the landowner re-entered. The latter subsequently relet the property for 900*l.* a year, from June, 1899, instead of 1,100*l.* from an earlier date. Consequently it seems clear that there was a distinct pecuniary loss, and that the case exemplifies the possibility of substantial damage falling on the landowner. The result of this loss in money was assessed by an official referee at 7,200*l.*, that is to say, two years' loss of the rent of 1,100*l.* and twenty-five years' purchase of the difference in the two rents. This assessment, we may here state, was approved and upheld by the Judge. The only other case which appears to have found its way into the legal reports on this subject was decided so long ago as 1840, and in it no damages were given because it was not proved that the landowner had really been a loser.

In the Chancery Courts, however, there have been decisions on this subject, but they are all somewhat peculiar, because, in equity, a contract to build a house is one in respect of which specific performance cannot be granted; but, on the other hand, a Court of Equity has made the builder take a lease and has given damages for the breach of the agreement to build. But this doctrine, though it established in the Chancery Court the right to damages, is somewhat academic in character, since a landowner does not care to press an impecunious builder to become his lessee, and then try to obtain damages from him when he has no money with which to pay them. The modern remedy is obviously that which occurred in the case on which these remarks are based, viz.: to re-enter on the land, and to obtain damages if possible from the builder.

This recent decision, therefore, in *Marshall v. Mackintosh* appears to be based on clear principles, which, though they were argued against, obviously are sound, and it is, in spite of being in some senses a legal truism, a judgment of much practical importance. It states the law in a modern form on an everyday business subject, so that there can in future be no doubt about it.

Of course, the pessimistic reader will remark that in most cases where a builder does not go on with a contract of this nature he is in financial difficulties, and though the right to recover damages against him may be theoretically pleasant, it is of little practical use. To a certain extent this is quite true. On the other hand, it is equally possible that a builder may be quite solvent, but may think he has made a bad bargain, and that the best thing he can do is to cease from the performance of his contract and let the landowner re-enter. In such circumstances the right conferred on the landowner by this recent case is of real value, since he may, under such circumstances, be able to recover damages. The knowledge also of such a possibility may very well keep a builder to the performance of his contract. The judgment of Mr. Justice Kennedy cannot therefore be too widely known.

PREMISES, BELFAST.—A year ago the premises occupied by the Station Cab Company at Donegal Pass, Belfast, were destroyed by fire. New premises have now been erected. The architect was Mr. Samuel Stevenson, C.E., and the builders, Messrs. J. & W. Stewart.

NOTES.

The Waltham Abbey Controversy. We have taken an opportunity of looking again at Waltham Abbey with the recent letters on the subject in our hands, comparing the building on the spot with the claims and arguments of the various correspondents. Our conclusion is that there is not the slightest ground for supposing that the five western bays can have been built before the Conquest, except the negative evidence that the author of the "Vita Haroldi," while stating that Harold built the church, says nothing about its rebuilding. But considering how history was written in those days, and considering that the author of "Vita Haroldi" may even have consciously wished to leave his hero the credit of having built the church as it then stood, we must not attach too much importance to that. In regard to the opinions of Burges and Freeman, on which Mr. Reeve throws some weight, Burges, though a great artist, was hardly a man to go to for "dry light" on a disputable point in archaeology, and Freeman's tendency was to credit his favourite Saxons with all that he possibly could. The five western bays, with their elaborate zigzag ornamentation, and the little "nick" on the lower part of the abacus, a feature which does not belong to the earliest work, could hardly in any case be regarded as contemporary with the nave of the Abbaye aux Hommes; but the difficulty is still greater when we are asked to believe that there are nearly 100 years between these and the two eastern bays. The break in design is very marked on the south side, in the mouldings of the capital and its obvious connexion, as Mr. Reeve observes, with the design of the window at the end of the south aisle; but none of the correspondents have noticed that on the north side, where the other changes are the same as on the south side, the capital between the two eastern arches is similar to those of the other bays of the arcade. This fact very much weakens the argument as to the important character of the break in design. The conclusion seems irresistible, on looking at the whole arcade, that the five western bays cannot be more than about a quarter of a century earlier than the two eastern ones; and in that case they were long after Harold's time. That the Normans should have rebuilt the church, if it were genuine Saxon architecture, seems to us the most natural thing possible; the only difficulty is the absence of documentary evidence where we might reasonably have expected it. But there are cases in which buildings are better than documents.

Society for the Protection of Ancient Buildings. We see from the daily papers that the Society for the Protection of Ancient Buildings has shown signs of existence again, and has resumed its Annual Meeting, of which we saw no report anywhere last year. The *Builder* no longer receives invitations to the meeting, its Editor having had the temerity, at the last meeting to which he was invited, to indulge in criticisms which evoked the sympathy of some of the members, and which the Secretary found it difficult to answer. To be regarded as a dangerous person is at all events one form of compliment. But the Society, in spite of its care to keep the meeting to people all of one mind, did not quite escape, inasmuch as their chairman

by invitation, the Bishop of Bristol, to some extent turned against them. He observed that they must face the fact that in England we are terribly crowded, and could only get room by increasing the number of stories in a building. "He must say, however, that when they went into the City of London on a fine Sunday afternoon, when they could really stand and look at things, they found out that beautiful buildings, very striking buildings indeed—buildings that would be no discredit to Venice or to Florence—had been put up in the City of London in quite recent times, and many of the architects of those buildings did not get the credit for their work. That was an answer to a good many of the criticisms with regard to the removal of old buildings." We fear the Bishop of Bristol will not be asked to preside again.

The Composition of the Atmosphere. In our last issue we referred to Professor Ramsay's recent discovery of a hitherto unknown gas, which he terms "Krypton," as a constituent of the atmosphere. It is now announced that Professor Ramsay and Mr. Travers have extracted two other unknown gases from the atmosphere which they name "Neon" and "Metargon" respectively. In addition, the discovery in the atmosphere of the unusually inert gas, "argon," made by Lord Rayleigh and Professor Ramsay a few years ago, will still be fresh in the memory of most of our readers. It is not surprising that these later discoveries were not made many years ago, for they have only now become possible owing to the great progress which has been made in liquefying gases and in spectroscopic examinations. The recent achievements of Dewar in producing appreciable quantities of liquid air, hydrogen, and helium, are not merely of interest in themselves, but are of importance inasmuch as they place new weapons of research of no mean value in the hands of the experimental chemist. The discovery in the atmosphere of almost every known stable gas in minute proportion would not have been matter for great surprise, but that it should yield so many unknown gases is certainly unexpected. The published particulars relating to the new gases are far too meagre at present to make it possible to state whether the new gases will possess more than a purely scientific interest, but as they all exist in the air in very small proportion only, it is unlikely that they will be more than chemical curiosities for some time to come.

Electric Tramways in London. The fact that a Select Committee of the House of Commons has passed part of the Bill for making electric tramways in some of the western suburbs of London is an important step. It is true that the promoters have lost that part of the Bill which refers to Ealing, but the fact that on part of it they have been successful, notably in that portion from Kew Bridge to Hounslow, is quite sufficient. For we have no doubt whatever that, once the people of London become familiarised with electric tramways, they will soon be established all over the suburbs of the Metropolis. They may be seen in comfortable and quiet operation at Dover, and if at Dover, why not in the less crowded parts of London? In our opinion a thoroughly good system of tramways will do more than anything else to relieve the congestion of the

suburban railways, and to make the going to and fro from London convenient.

Uniformity of Electric Plant. THE paper read recently by Mr. Wordingham, the City Electrical Engineer of Manchester, to the Municipal Electrical Association, "On the Necessity for Uniformity of Plant and Apparatus," touches on a point of vital importance in electrical engineering. It is a serious matter for the welfare of the industry that nearly every electrical power station in this country supplies its consumers at a different "declared" pressure, some choosing their pressures for no very obvious reason. One supplies its consumers at 113 volts and another declares a pressure of 420 volts, in defiance of the regulation of the Board of Trade to the contrary. Then the stations differ in kind, about half using alternating and the other half direct current. Of the sixty or seventy alternating current stations, seventeen supply at a frequency of one hundred, and the rest can be divided into twenty different groups. Consulting engineers also, instead of ordering engines and dynamos of stock sizes (say a multiple of a hundred horsepower or a hundred kilowatt) will order all kinds of odd sizes. It is obvious that manufacturers are unable to stock dynamos, motors, meters, lamps, &c., to suit all those varying requirements, and hence tedious delay and unnecessary expense. Any one who visits the large electrical works in America will see long lines of engines, dynamos, &c., ready to go out on receipt of orders. Hence there is immediate delivery, and as all the parts are standardised and interchangeable the cost of repairs is very slight. The Municipal Electrical Association have appointed a committee to consider this important matter, and we hope that they will be able to give some practical suggestions to secure this desirable uniformity.

Supposed Discovery at Peterborough. A PARAGRAPH has been going the round of the daily papers to the effect that "an important discovery has been made at Peterborough. During the under-pinning of the north-east corner of the Eastern Chapel the workmen came across the Saxon ditch. The foundations of the Eastern Chapel were found to be partly built on the ancient Saxon wall, which was a great surprise, as it was considered that the building was in the vicinity of the old Saxon ditch which bounded the original Medehamstead or ancient Peterborough, and that the foundations having been placed within the area of the ditch accounted for the subsidence." If this means, as we suppose, the north-east angle of the chapels on the east of the south transept, it is no discovery at all. If the originator of the paragraph refers to our plan of Peterborough, published in the *Builder* of April 4, 1891, he will find that two of the piers of these chapels, including the north-eastern one, are there shown as built on the Saxon wall.

City and Guilds Institute. FROM the Report of the Council of the City and Guilds of London Institute for 1897 we learn, among other things, that the School of Art Woodcarving, which has long occupied rooms at the Institute, is unavoidably under notice to leave, the rooms being required for



Hampton Court in the Reign of Queen Mary, showing the Water-gate of which the foundations have recently been discovered.
(From the copy of Wynegaarde's view in Mr. Law's "History of Hampton Court.")

laboratory work in connexion with the teaching of mechanics and mathematics. In regard to the "Trade Classes" (originally called "Building Trade Classes"), which include Plumbing, Sheet Metal-work, Builders' Quantities, Bricklaying, Carpentry, and Cabinet-Making, it has been found that the development of polytechnics has affected the attendance at these classes, by offering instruction to men nearer their work or their homes; and the Executive Committee have resolved to take steps to transfer these, with the exception of the Cabinet-Making class, to an institution of a polytechnic character. The work of the Enamelling Classes in the Art department has been developed, and now includes Artistic Metal-work and Silversmith's Work. It is added that "at the Royal Academy and Arts and Crafts Exhibitions many pieces of work by past and present students of these classes have been exhibited and have attracted much attention."

It may interest those of our readers who are not acquainted with Hampton Court literature to see the representation of the Water Gate at Hampton Court of which the foundations were recently found. The view given here is reproduced, by Mr. Law's permission, from the copy of Wynegaarde's view given in his "History of Hampton Court" (Vol. I). The piers, Mr. Law informs us, were of chalk faced with stone, and of great thickness; that on the westernmost side 27 ft. thick, that on the east 21 ft. The opening for the barges was about 15 ft. wide. The chalk was extraordinarily hard.

THE Public Orator of Cambridge, Dr. Sandys, has kindly sent us the text of the portion of the Latin oration, introducing the candidates for honorary degrees, in which he introduced Mr. Penrose; it may interest some of our readers to see it:—

"Hodie reducem salutamus alumnus nostrum qui abhinc annos fere septem et quinquaginta Thamesis inter undas e certamine nautico cum Oxoniensibus commisso semel tantum victus, plus quam semel victor evasit. Olim Academiæ nomine in Italiam et Græciam missus, de Atheniensium templis opus egregium edidit, in quo Parthenonis et columnas et epistylum columnis impositum lineis non rectis sed leviter curvatis contineri primus

omnium ostendit, et ordinis Dorici maiestatem artificio tam minuto adjuvari demonstravit. Idem nuper de templis Græcis ad stellas quasdam orientes conversis ingeniose disputavit. Illud vero felicitatis conspicuae documentum Nestori nostro contigit, quod et Athenis et Londinii architecturae studiis diu deditus, non modo Sancti Pauli ecclesiae cathedralis in culmine sed etiam Iovis Olympii columnarum in fastigio solus omnium mortalium constitit. Viro ad tantam altitudinem evecto non sine reverentia quadam in hoc templo honoris lauream nostram lacti decernimus.

Duco ad vos Collegii Magdalenæ socium, Britannorum Scholæ Archaeologicae Atheniensis et Regio Architectorum Instituto nuper praepositum, FRANCISCUM CRANNER PENROSE."

Mr. Penrose has received no mark of distinction from the Crown, though he had a far higher claim to such honours than many of those on whom they are bestowed; had he lived and worked in France the Government would certainly have recognised his work. It is gratifying to find that our great seats of learning, at all events, show a little more discernment.

It is stated that the remains of Sir Nicholas Crispe, Knight and Baronet, have been removed from this church for reinterment in the graveyard of the (new) parish church at Hammersmith.

The Crispe family had for long been residents in, and benefactors to, St. Mildred's Parish, and some of them, including Sir Thomas, son of Sir Nicholas, were buried in the church. The father, a devoted Royalist, lost large sums of money—amounting to more than 100,000*l.*, the inscription on his son's tablet testifies—in the service of Charles I. and Charles II. during the troublous times of the Civil War and the Commonwealth; "but this was repaired in some measure by King Charles II.," as his executor recorded on the tablet placed in the church to the memory of his son. Sir Nicholas Crispe set up a bronze bust of Charles I. in the (old) church at Hammersmith, built and consecrated in 1631 by Archbishop Laud, and in the urn beneath the bust his heart was deposited. He died on February 26, 1665. He traded with the Gold Coast, and is said to have contrived a new system of brick-making. St. Mildred's Church was closed recently for some interior repairs, and we understand that all the human remains from beneath the floor are now taken away.

Mr. Mortimer Menpes' Etchings.

At Messrs. Dowdeswell's Galleries in Bond-street there is on view a collection of what are called "colour-etchings" by Mr. Mortimer Menpes. These appear to be ordinary etchings or dry points printed in colours. We presume that the real meaning of this is either that different portions of the etched plate are filled, successively, with different coloured ink or pigment, and the complete result arrived at by a series of printings, as in chromolithography; or else that the whole of the colour scheme is prepared in pigments on another surface and pressed on to the etched plate, and the impression taken off at one printing. The precise process the artist however has not divulged. That the printing is a somewhat difficult and delicate matter is obvious from the statement in the catalogue, that one hundred is to be the maximum number of proofs pulled of any subject, and that "as many of the more delicate ones will not yield anything like so large an edition, the plates will be destroyed the moment they show the least sign of wear." We can hardly see that the result is worth the trouble that must be necessary to obtain it. We should rather be inclined to say that the colour and the etching mutually spoil each other, and that it is an attempt to do something with etching which is foreign to the nature of the process. As a curiosity in artistic work it has its interest, however.

SCULPTURE AT THE ROYAL ACADEMY.

It can hardly be said that there is any great work in sculpture this year at the Royal Academy, but there are a good many interesting productions, and this year's exhibition again shows what progress there has been of late years in regard to originality and inventiveness in English sculpture. It is not so many years ago that the sculpture show at the Academy consisted largely of what one may call respectable commonplaces in art; figures modelled with care according to a certain conventional standard, but illustrating only worn-out Classic subjects or homely domesticities, mostly destitute of any marked character or individuality either in conception or treatment. At the present time such dull work, though it exists, is in the minority; and each year, besides the few leading works, we find a good many smaller things which, though not representing the highest type of aim or achievement, interest one by their novelty of conception and treatment. The commonplace in sculpture is of all things the quality that can

be least tolerated; and from the commonplace we seem to be getting pretty fairly emancipated.

The central work by Mr. Fehr, "St. George and the Rescued Maiden," which we have already illustrated, depends for its success on the figure of the knight, giving a last look down at his prostrate foe, sword in one hand, while the other clasps the waist of the very willing maiden who is held aloft against his left shoulder. The figure of St. George is fine and the form of helmet introduced, with its deep side pieces forming a kind of frame to the face, adds to the picturesqueness of the figure, as Mr. Pomeroy has also discovered in his figure of "Perseus" in the Lecture Room, though it was Sir E. Burne-Jones who first showed what artistic suggestion there was in this form of helmet. For the rest, the conception of the St. George group is to our thinking too theatrical; there was no need that St. George should hoist the young woman up in his arm; if she were a "maiden" worth delivering she would hardly have thought this a dignified or respectful treatment; it is doubtful whether she could really be sustained in that position; it is at all events certain that she could not be held in that way without suffering considerably from the grip of the knight's armoured hand. So that altogether it is rather an uncomfortable and unsatisfactory composition.

Taking the exhibits round the side of the octagon hall, the first one we come to in the order of numbering, on the left side of the door on entering, is perhaps in some respects the most satisfying piece of sculpture of the year, though it only appears at present in the form of a plaster model. This is Mr. Natorp's "Diana," a partially draped figure very finely composed in lines and posture, and very dignified in expression. It represents some of the finest characteristics of sculptural art, and we hope it may re-appear next year as a work in marble.* Next to this is an exhibit which has considerable architectural interest, Mr. Pegram's full-size model of a bronze candelabrum to be erected in St. Paul's Cathedral. This is a work some twelve feet in height, triangular in plan at the base; among the most prominent decorative details are three subjects in very low repoussé relief on three panels, two of them representing the Temptation and Adam and Eve after the fall; the third probably the Crucifixion, but this candelabrum, which is emphatically a kind of design that ought to be seen all round, has been very unsuitably placed against the wall, so that the total design cannot be well judged of. Over these panels is a frieze of symbolical animals in alto-relief, the precise intention of which, partly owing again to the third side being hidden against the wall, it is not easy to make out. The work as a whole is a fine and sumptuous piece of decorative design.

Mr. Fuchs's "Mother's Love" may be lightly passed over—a group at once commonplace and sensational. Mr. Simonds's "Swan Girl" in marble occupies the same position as the bronze last year, and we need not repeat our previous comment on it. Mr. Taubman's "Joan of Arc"† is a work of realistic character, and as such of considerable interest; it is a coloured statue representing Joan as a child looking up with a face of inspired contemplation or expectation, and if there is little physical or sculptural beauty in it, there is at all events an element of spiritual beauty. Miss Pownall's nude crouching figure "La Madeleine" (why put a French name to a statue in an English exhibition and by an English artist?), is a good piece of work without being specially impressive; Mr. Purse's "Cock and Snake" is a spirited piece of bird modelling; Mr. Horace Montford's seated statue of Darwin is as successful as that kind of figure can be made, perhaps, but it is not what sculpture is for; and Mr. Stirling Lee's "Echo," a piece of pure sculptural work, strikes us as a figure somewhat weak in the legs. Mr. Cowell's "Wood Nymph," a life-size terra-cotta nude reclined on the bough of a tree, is a curiously

* We shall be able to give an illustration of this next week, as well as of four other works mentioned in this article, viz., Mr. Taubman's "Joan of Arc," Mr. Schenck's "Triton," Mr. and Mrs. Dawson's silver and enamel casket, and Miss Rope's "The Kingdom of Christ." For these we have not been able to make room in this week's plates.

† Students of history have now, we believe, fully decided that Joan was never "Joan of Arc" or "Jeanne d'Arc," but simply "Jeanne Darc," a peasant girl whose surname was Darc. The prefix *de* to a French name denotes nobility of family, to which of course Joan had no claim. Artists might as well therefore recognise this correction of the previous erroneous nomenclature.



Bust of Edward VI., Grammar School, Bury St. Edmunds. Mr. Mark Rogers, jun., Sculptor.

angular figure with a face more like that of a man than a woman; this character may have been intentionally impressed on it by the sculptor as his ideal of the wood nymph species; if so, there is an individuality of conception to reckon with. Apart from this the figure is not a very beautiful or attractive one; still, it is not commonplace, like some of its near neighbours. M. Marqueste, the well-known French sculptor, exhibits a life-size marble group of mother and infant, "The First Steps," which provokes a smile, it is so obviously a work made for the English market, where these domesticities are supposed to be specially attractive. It is hardly a work equal to the sculptor's reputation, but there is a classic beauty about the mother's face. The only other work in the octagon which need call for special mention is Mr. Wade's large allegorical group of "Truth," which evidently means a good deal, though the meaning is rather obscure. "Truth" is a nude figure of rather coarse corporeal design, stand-

ing on a small globe which is balancing on a larger one, round which there is a kind of projecting "ring of Saturn" (that is what it reminds one of) through which faces half appear, whose bodies go off below into half-shapen forms; these, we must suppose, are trying to attain to Truth; in the centre a woman struggles above the level to hold her infant up to the face of Truth. This latter is the finest suggestion in the work, which is seriously intended in conception, but falls short in decorative beauty, without which sculpture has no adequate reason for existing.

Of the works which are placed in the centre of the Lecture-room we give three illustrations (see lithograph). Mr. Pomeroy's "Perseus" is a fine heroic-looking figure, though we do not know that, without the note in the catalogue, we should have discovered that it stands "as a symbol of the subduing and resisting of evil." Mr. Colton's well-modelled figure, "The Girdle," is an example of what may be called the realistic nude, which looks better in

the side view than in the front view shown in the illustration; but it is very deficient in grace, and one can hardly say that the result, in a decorative sense, is commensurate with the conscientious care bestowed on the modelling; the attitude is somewhat ungainly in a sculptural sense. Mr. Drury's "Even," as a specimen of a decorative figure, one of a series of eight, for a public square, is very satisfactory, and it is something to see so good a piece of design introduced as a piece of open-air sculpture. The figures, which are repetitions in bronze, are to surround the central garden of the new Place opposite the Leeds post-office, which we noticed as in course of formation at the time our article on Leeds architecture was written. Besides these, we have Mr. Thornycroft's admirable little bronze statuette "The Bathing," a too sensational figure by Mr. Lucchesi, brandishing a sword and entitled "The Crash of Doom," and a small model of Mr. Harry Bates' fine colossal monument to Lord Roberts, exhibited on its full scale a year or two ago in the courtyard of Burlington House. We must not forget also Mr. Goscombe John's curious and quaint figure, "The Elf," suggested by a passage from Victor Hugo; a very original and characteristic conception, though perhaps a little too odd for sculpture.

At the side of the room the most important works are Mr. Frampton's "Bronze Memorial" and Mr. Onslow Ford's seated statues of "Justice" and "Knowledge," parts of a monument to the late Maharajah of Mysore. Of the two figures "Knowledge," a half-nude figure bending over a scroll (rather an old motive), and with a decorative wreath on her head in metal, is the finest. Mr. Frampton's "Memorial" is intended to be placed against a wall; it contains a good deal of pretty detail; the decorative use of the two ships, with triangular sails, one at each side, is an effective feature. On the opposite wall Mr. Fehr's coloured frieze, "Battle of Wakefield," we presume intended for a town hall, is effective as a whole, but rather difficult to make out in detail.

Among the smaller works at the side of the room are a good many which have a distinct interest; the very best is perhaps Mr. Schenck's bas-relief panel for Shoreditch baths, a Triton figure, very cleverly arranged so as to fill up a square panel; an admirable bit of architectural sculpture. Taking some other things in the order of position, we may notice that Miss Langley's "Door-knocker," a pretty bit of work, illustrates again the fault that we generally find in door-knocker designs, that the design does not suggest anything to knock with. In this case a female figure stands on a small sphere, which latter forms the knocking portion, and operates on the backs of two peacocks, certainly not a suitable kind of anvil to hammer on. Of Mr. Rogers's bust for King Edward's school at Bury St. Edmunds we give an illustration; the work is placed, or to be placed, in a niche on the outer wall of the school. Mr. Fuchs's bust of Miss Alice Montagu shows a pretty head, and is mounted on a well-designed and original architecturally treated bracket or base. Mr. W. J. McLean's "Ailsa," a bust, is beautifully modelled, though perhaps a little too much smoothed down in finish. A cup by Mr. Natrop, a gold tazza held aloft by a female figure in ivory, is a very pretty work. Mr. Goscombe John's "Drinking Horn and Stand" is a sumptuous and spirited piece of silver-gilt decorative work, the stand being a convoluted dragon with one paw on a glass sphere; another example of the manner in which able sculptors are beginning to turn their attention to silversmith's work. Mr. Paul Montford's "A Favourite of the Gods" is a beautiful little alto-relief in which a nude youth seems under the protection of a divine figure which fills up the background, while its wings form a frame to the composition. Mr. E. G. Bramwell's small "Sketch Design for a Tomb," a little plaster model, shows admirable lines in the combination of sculpture with architecture. A small memorial tablet to General Limond, by Mr. Harry Bates, to be executed in Irish green marble and bronze, is an original and striking little work; the bas-relief represents the legend of St. Hubert (is it not?) and the supernatural stag, standing in a magnificent attitude, and with a metal glory radiating from it. Among other things specially worth notice in this part of the room are Mr. and Mrs. Dawson's "Silver and Enamel Casket," a charming bit of decorative work; Mr. H. Wilson's "Tabernacle" or reliquary in bronze and enamel, an original piece of design with a

great deal of character; Mr. Reynolds Stephen's "Low Relief—Bronze," where a bas-relief figure of a girl, full of beauty and spirit, is modelled in a medallion, carried on a very well-designed stand; and two pretty little reliefs by Miss Rope, one of children dancing, the other "A Sea Chariot," where some water-fairies drive a team of the little fish commonly called sea-horses. There are other things worth attention, which we have not space to mention; but, without counting the principal works, it may be said the smaller productions in the sculpture room include a large proportion of things which are of original and really artistic conception. It is a pity to see the room so empty, and these works so neglected by a public who seem to think there is no form of art but pictures.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

PRESENTATION OF THE ROYAL GOLD MEDAL.

THE concluding ordinary meeting of the present session of this Institute was held at No. 9, Conduit-street, W., on Monday evening, Professor Aitchison, R.A., President, occupying the chair.

The minutes having been taken as read, Mr. William Emerson, the Hon. Secretary, explained that the only important matter to engage their attention that evening was the presentation of the Royal Gold Medal to the President. He would at once call upon Mr. F. C. Penrose, F.R.S., President 1894-96, to say something and present the medal.

Mr. Penrose then delivered the following address:—

"Brother architects, ladies, and gentlemen, —I have had great pleasure in responding to the request made to me that, as preceding President of the Institute, I should undertake an office the only one I can imagine which your actual President would not perform a great deal better than I can, but under the circumstances I can understand his hesitation in respect to the function which has called us together to-night. And it is, perhaps, better also that the person who undertakes the duty of investing the recipient of this honour should be independent of the body who made the selection of the name to be presented to her Majesty. Few, if any, of our own members will want to be told of the claims of George Aitchison, R.A., for this honour; but the proceedings of this evening will have a wider circulation, and it is incumbent on me to show, as I hope to do, how fully the Council are justified, both on architectural and literary grounds, in the choice that has been made.

Our President's father was an architect, and appears to have destined him for the profession from the very first. There have been, no doubt, cases where this "predestination," if I may call it so, has had an unfavourable effect, and some of the most brilliant careers (of which those of Lord Leighton and the President of the Royal Academy are instances) have been of those whose natural bent opposed itself successfully to parental proposals. But exceptions do not disprove a rule, and it is evident that in general the rule has worked well, as it certainly has in the case before us. Mr. G. Aitchison, senior, up to the time of his death, was architect to the St. Katharine's Dock Company. His practice was mainly in wharves, warehouses, and offices, and structural alterations on a large scale, and he built the road stations on the London and Birmingham Railway. In his younger days he was very intimate with Donaldson, who may be called the Father of the Institute, with T. H. Wyatt, who acted under him during the building of the Docks, and he reckoned amongst his friends Sir Charles Barry and Professor Cockerell. All these, and especially the two former, took great interest in our President as a boy. Thus he was bred in an architectural atmosphere.

His regular education began at Merchant Taylors' school, where he remained until his sixteenth year, when he was articled to his father, and during his pupillage attended the science and art classes at Somerset House, where the late Mr. Herbert, R.A., was then master. In 1847 he became a student of the Royal Academy, and after the completion of his articles took the degree of B.A. at the University of London, in 1851, whilst continuing his architectural training in his father's office. In January, 1853, he travelled through France, and thence to Genoa, Leghorn, and Pisa, and arrived in Rome just before the Holy Week,

visiting with keen interest the most important buildings. From Rome he travelled by land to Naples, and thence to Amalfi, Salerno, and Paestum. Returning to Rome, he made valuable friendships with the artists assembled there in that year, 1853, viz., G. H. Mason, the idyllic painter, by whom he was introduced to two future Presidents of the Royal Academy, Leighton and Sir Edward Poynter; and he also met Waterhouse and W. Burges. Leaving Rome after the Holy Week of 1854, he travelled in company with Burges to Arezzo, Perugia, and Assisi, where they stayed some weeks, making notes and sketches of the important fresco decorations of Cimabue and Giotto in the church of San Francisco. Thence they went to Florence, where they stayed several months, making notes and taking sketches and measurements of some of the palaces and other monuments; then continuing their studies at Siena, Pisa, Lucca, and Pistoja. As the cholera was raging they could not then visit any places further north in Italy, but proceeded via Leghorn to Marseilles, and visited Lyons, Beaune, Dijon, and Troyes together, where they sketched and measured ruins. The two friends then separated, and Aitchison met his parents at Paris, and with them returned to Italy, visiting Milan, Venice, Padua, Ravenna, Faenza, Bologna, Ferrara, and Verona, and then, by way of Switzerland, Strasburg, and Paris, returned to London in the summer of 1855. He then became his father's head clerk, and was taken into partnership with him in 1859. During this partnership he saw a great deal of work of an engineering character on the Chester and Holyhead Railway.

In June, 1861, his father died, and he began practice on his own account, becoming architect to the St. Katharine's Dock Company, after the amalgamation of the St. Katharine's with the London and Victoria Dock Company. He was engaged chiefly on large massive works—wharves, warehouses, and suites of offices—but was enabled occasionally to introduce architecturally-designed fronts and staircases. The tobacco warehouse and offices and other warehouses for the Victoria Docks had a frontage of 500 ft. by 170 ft. in depth, costing 65,000l. Messrs. Hubbuck's warehouse on the Thames has some architectural character.

Having thus laid the sound foundation of constructive execution, as indicated above, we find him, in 1865, emerging into genuine and finished architecture by the building of Lord Leighton's house, to which the glass house, the Arab hall, and picture gallery were subsequently added; and he also designed the ornamental furniture of the house, thus making it a complete work, not less admirable for its architectural form and fitness than for its masterly decoration, as an example of what may be done in permanent colour. The decoration is not of an evanescent character, being mainly of marble, mosaic, and tiles, the ancient tiles being Saracenic. The same is the character of other works by our President, as, for instance, Cerkeley-square, No. 1, South Audley-street, 9, Chesterfield-gardens, 52, Prince's-gate, and 1, Grosvenor-avenue, where the structural work is carved or inlaid with ivory, mother-of-pearl and lapis lazuli.

In 1869, through a chance recommendation given by Leighton, he altered and decorated the hall and staircase at 44, Belgrave-square for the Hon. Percy Wyndham, for which paintings in combination were made by Leighton; and this led to his being employed in much decorative work, viz., for her Royal Highness the Princess Louise at Kensington Palace, for the Duke of Montrose, Lord Leonfield, Sir W. Lawson, Sir S. Waterlow, Mr. Eustace Smith, M.P., Mr. John Aird, M.P., Mr. J. H. Renton, and a great many others.

In 1868 he built the new board-room for the Thames Conservancy, designing also the furniture, whilst Leighton modelled the frieze of the board-room. In 1871 he altered and enlarged the house of Mr. F. Lehman, M.P., 15, Berkeley-square, and designed the furniture. In 1884 a house for Mr. J. Stewart Hodgson, which had been left unfinished by the death of his friend, F. P. Cockerell, was put into his hands to complete. This implied the design of the whole of the interior work and decorations. For the same owner he also made large additions to his house at Lythe Hill, designed the fittings, and decorated the rooms with colour and bronze. In 1877-78 he rebuilt Founders' Hall, and in 1886 the Royal Exchange Assurance Offices in Pall Mall, and in 1892 decorated in colour the Livery Hall of the Goldsmiths'

Company. The works above enumerated are only a small part of the list that could be mentioned.

He designed the decorations for the British Art Section at the Paris Exhibition of 1878, and was elected one of the officers of Public Instruction in Paris. He has been elected a member of the *Société Centrale* of the French architects, and also of that of Belgium, is a foreign Associate of the Royal Academy of Belgium, and has received numerous medals from our own colonial associations in recognition of his claims as an architect.

In 1881 he was elected Associate of the Royal Academy, and in that position gave occasional lectures, but, after being chosen Professor of Architecture in 1887, he has given his lectures annually.

To his architectural he has added much good literary work, besides the lectures already referred to. He wrote the "Science and Art Syllabus" on the Principles of Ornament. He edited Ward's "Principles of Ornament" in 1892, and four years later added an appendix on the Orders. In fact he not only edited but practically rewrote the whole work. He is a contributor to the "Dictionary of National Biography," and one of the Examiners in the Science and Art Department at South Kensington.

Although the claim for nomination to the Royal Gold Medal is not in the least confined to members of this Institute, and has been so considered by the Council on various occasions, it is nevertheless a source of great satisfaction to find one so worthy to receive it amongst our own body, and one who has so continually assisted our pursuits.

Elected thirty-six years ago, our gold medallist of this year has assisted frequently in the Council, was Vice-President for four years, reckoning from 1889, has contributed various papers of great interest, has been an examiner in the voluntary examinations, and has worthily maintained, since 1896, the honourable but not unobtrusive post of President.

I wish to conclude with a few remarks on the Royal Academy Professorial lectures before closing this short summary of our President's claims to this distinction. No one can have read these valuable lectures, always fully reported in the *Builder*, without feeling that they are calculated to encourage the architectural students who heard them, as well as those who have followed them as readers, to keep before their eyes a high ideal of architecture as an art, based on sound construction, technical knowledge, and true principles of design, as its essential aim; and that whilst archaeological considerations are not to be ignored, they should never be allowed to dictate or force the hand of the architect into lines inconsistent with the former more important principles, and that it is only on such lines that architecture can flourish as a living art. I am not aware that any one has urged these views, which appear to me to be perfectly sound, so persistently and so well as our President, whom, with, I am sure, your approval, I shall now proceed to invest with her Majesty's gracious gift.

Mr. Penrose added that there were a number of Professor Aitchison's drawings hung on the walls of the room in which they were met. He then invested the President with the medal.

The President, in reply, said: "Brother architects, ladies, and gentlemen,—After the very flattering remarks that have been made by my learned predecessor, Mr. Penrose, it would be difficult to know what to say if it were necessary to speak of myself, but I do not think it is. All I need say is to return you my heartfelt thanks for the distinguished honour you have done me. In proposing me for this gracious gift of her Majesty the Queen, and thus adding my name to the illustrious catalogue, you have, in my opinion, conferred on me as an architect the greatest honour that England can bestow.

The most cherished desire I have is to see English architecture come to the forefront, and erect masterpieces in England which can epitomise the grand thoughts of the day, and give them a character which will attract mankind. When I look at Salisbury, at York, at Peterborough, at Durham, and at Lincoln, I cannot think that they fall greatly below the most renowned cathedrals of Europe. I cannot believe that the nation that has given us the steam-engine, the railway, the telegraph, the steamboat, and all the triumphs of iron; that has given us Darwin, Tyndall, Huxley, and Herbert Spencer; Parkes, Simpson, and Lister; Turner

Leighton, and Millais; Wordsworth, Browning, Tennyson, and Swinburne, can have sunk so much below the standard of our semibarbarous forefathers of the thirteenth century as to be incapable of developing the architecture we have into a true presentment of the highest aspiration of the nation and the ideal beauty of our time. No, it is that we have got into a wrong groove, and we must get out of it before architecture ever again becomes a progressive art, and can equal or surpass the glorious masterpieces of the past.

The Renaissance men, although they did some noble and some beautiful work, got architecture out of the way of progress by casting themselves at the feet of the Romans, and proclaiming that Roman architecture was perfection, and could not be surpassed; ever since, all the architects of Christendom have only attempted to paraphrase some deceased architecture.

No one can deny that architecture is the poetry of arrangement and construction, and we must have these at our finger ends before we can hope to progress, so that when the heaven-born genius comes he will have his tools ready. Genius to us is a causeless *spirit*, to use the breeders' term, but, looking at its paramount importance to mankind, one would think it is of more importance for us to study the law of it than to improve the breed of race-horses or of sporting dogs. You are not to think that arrangement and construction alone will give us all we want, or else the marvellous works in iron of the engineers would have given it us. We have to study the methods of expression that the masters of our art have employed, to learn how we may express our thoughts in our own climate; and we have both to study and to strive, for that is the foundation of all improvement. We must, too, of necessity have change and novelty; different times, different surroundings, and different circumstances beget a different frame of mind. We cannot suppose that the delight at the lark's song affected the Greeks, the Romans, the medievals, and people of the Renaissance exactly in the same way as it affects Englishmen of the nineteenth century. Homer and the Greek dramatists, Virgil and Horace, Dante and Chaucer were possibly poets superior to our own; but they do not come home to us like those of our own day. The loves and misfortunes of the past do not touch us as those of the present, and few of us can weep over the misfortunes of Hecuba, Iphigenia, Antigone, and Dido. Our own poets, whom we look on as the greatest, Shakespeare and Milton, do not touch the inmost strings of our hearts like the poets of yesterday or to-day. Walter Scott saw that, and said the surrounding may be of any time you like, but the heroes and heroines must be of to-day, or no one will take an interest in them. Our revivals of Classic, Gothic, or Renaissance may be very clever and very good, but no one of them ever caused the same emotion in us as it did in the people of its day. I know you will say people did care for architecture in those days, and they do not now; but while there are buildings to be erected it depends mostly on the architect whether they are to be true and good, for he can always refuse to erect that which he feels is not true or not proper.

I feel sure that there must be structural poets among the vast army of architects with which the country is now furnished, and though I feel it is rather an impertinence to suggest what a poet should do, I cannot help feeling that there are vast fields in England still untouched. One of the greatest merits of Athenian architecture is that it takes the utmost advantage of the clear air and brilliant sunshine both in the main structure of its buildings and also in its mouldings; and, mind you, the materials are marble. We, since Gothic times, have never taken the slightest trouble with our mouldings, to make them tell their tale in the damp and dulness of our climate; and when one considers that architecture has been defined as the art of moulding, this alone offers a large field.

Another field, not altogether so untouched as moulding, is proportion, and that field is infinite. And here I speak of the infinity of good proportion, for there is a still greater infinity of bad ones. In a handful of flowering grasses each one will give you a different and elegant proportion, and at least for iron we need not be confined to the classic proportions perfected by Vignola and Palladio.

We have scarcely tried to bring cast iron within the pale of architecture, although it has

a capacity for almost every form, and is open to the magnificence of enamel. In fact, colour is almost untried and, seeing the dust and soot of large manufacturing towns, it would add to their healthfulness, as well as to the raising of our spirits, if, in our damp and depressing climate, the fronts of our buildings ceased to be of dingy brick and were resplendent with gorgeous colour and gleamed with gold. I know that there is a prejudice against the use of coloured and enamelled pottery (ironically called buildings of crockery) but since Nature has coloured all her work we need not be ashamed of doing so, and the gorgeous and monumental decoration of Darius's Palace at Susa should help to dispel this misconception.

I have only touched on a few subjects, but even with these I fear I have exhausted your patience. Let us hope that our new structural poets may give us a beauty and magnificence hitherto undreamt of; and that architecture may again captivate the public and be the boast and pride of the coming century.

Dr. Murray said he would not pretend to adequately express the pleasure it had given them all to listen to Mr. Penrose when he recounted the achievements of the President from his youth to the present day. To most of them this extraordinary activity was more or less new. They knew the President chiefly from his drawings, his lectures, and from his later works (such, for instance, as the great staircase at Lord Leonfield's, in Chesterfield Gardens); they were not prepared to hear of the vast amount of work he had done in his earlier days. Most of them knew him chiefly as a friend and a man to whom classical architecture was dearer than, perhaps, to any other man he (the speaker) had ever met; and specially did he know him because of the services he had rendered in the British Museum when they have been in difficulties of one kind or another—in the reparation or restoration of certain of their examples of the Greek architecture. No pleasure had been greater than to have the ready and warm assistance of the President of the Institute. He had no right to speak on that occasion except for this long friendship, which was not altogether unique because they all had him as a friend, and except for the circumstance that the Greek architecture which the President loved so well was under his (the speaker's) charge in the Museum.

This concluded the proceedings. The Chairman announced that a special general meeting would be held on Monday, June 27 at 8 p.m., to resume the consideration of the revised schedule of professional charges, which had been adjourned from the meeting of June 6.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS.

SIR WEETMAN PEARSON having kindly given permission for the Architectural Association to visit his mansion*, about forty members went down on Saturday last. They were met at Three Bridges Station by carriages, and, as the weather was favourable, much enjoyed the three and a half miles' drive through the nut-fringed lanes leading to Paddockhurst. Mr. Aston Webb, who has just made the important additions, was in waiting with Sir Weetman and Lady Pearson; and, after tea, parties of about fourteen, as time was short, were shown by Sir Weetman, Mr. Webb, Mr. Milner, and the clerk of the works, over the house, farm, gardens, and stables. The work has been mainly carried out in workshops on the estate, without contract. The stone used is quarried on the estate and is a fine sandstone, which has good weathering qualities. Taking advantage of the magnificent views over the South Downs, extending nearly to Brighton, the gardens and terrace have been arranged accordingly. Internally, the principal additions are winter gardens, bowling-alley, numerous bedrooms, and a new dining-room, with a charming music gallery, the frieze of which has been designed and carried out by Mr. Walter Crane, and represents all phases of locomotion; the ceilings by Priestley, much of which has been carved *in situ*. The panelings of this room are of the very finest Honduras mahogany, specially imported. There is a fine new oak staircase to Lady Pearson's boudoir, which has been cleverly arranged. The decoration and furniture of this boudoir have taken

* For an illustration of the additions see our issue for September 11, 1897.

years to collect, and are all of the best period of the French Empire; in fact, nearly all the furniture is French, and the examples of Buhl and Riesener are quiet priceless. A great feature in the house is the lavish use of Mexican onyx, much of which is so exquisite that, as Mr. Webb remarked, it is worth its weight in gold. The baths, of which there are about twenty-five, are many of them of white metal, the towel-horses being of the same, and hot water passes through them on the way to the bath, thus warming them. There is a 2,000-light electric installation, which power is used even for heating the shaving water. The carving has been done partly by Mr. Aumonier and partly on the estate. The gardens, which have been planned under Mr. Milner's guidance, will in the course of time be of great charm. The conservatories, fern houses, and covered orchards attracted much attention, and on the members arriving at the house a cold collation was served in the dining-room, and a very cordial vote of thanks was proposed by the President, Mr. Fellowes Prynne. Sir Weetman, in reply, referred to the history of the house, and said that he called in professional advice about the enlargement of the Hall window, and it had taken three years to get rid of the workmen. Mr. Webb, in a short and graceful speech, alluded to the help and kindness he had received from his client and Lady Pearson. It was found by this time that the brakes were at the door, and after another pleasant drive, an express train took the party up to town, greatly pleased with what had been an exceptionally pleasant visit to a mansion which will doubtless be one of the most attractive within easy reach of the metropolis.

COMPETITIONS.

COTTAGE HOSPITAL, HINCKLEY.—A special meeting of the New Cottage Hospital Committee was held at the old Grammar School, Hinckley, recently, when the Chairman explained that the meeting had been called to decide upon plans for the new hospital. Three plans had been before the Committee, and had been submitted to Mr. Goodacre, of Leicester, who was asked to send in a report. The names of the architects had not been disclosed, and on Mr. Goodacre's report the Sub-Committee had decided to accept Mr. J. Wigg's plan. The Secretary said he wrote to the architects asking them for the probable cost to carry out their plans, and was informed that Mr. Wigg's plan would cost £3,000, or £4,000, inclusive. Dr. Smith proposed that the recommendation of the Sub-Committee be adopted. Mr. Chapman seconded, and it was agreed to.

NEW FREE LIBRARY, LEAMINGTON.—The Joint Building Sub-committee of the Free Library Committee and the Technical Instruction Committee have passed a resolution upon the Town Council to proceed at once with the erection of the building which is to house the new Free Library and Technical Institute. They also recommend that plans and specifications be immediately advertised for, the architect sending in the best design to get the work, and a premium of twenty-five guineas to be awarded for the second best design. The cost of the new buildings is estimated at £12,000, exclusive of the site.

INTERNATIONAL FISHERIES EXHIBITION, ABERDEEN.—The Aberdeen Building, Lighting, and Grounds Committee have issued to architects a circular inviting them to send competitive plans for the buildings to be erected for the exhibition to be held in Aberdeen next year. The circular is in the following terms:

—The buildings will be of wood with corrugated iron roof. The plans will show a frontage extending to about 600 ft. or thereby, and facing the road running from the end of Constitution-street to the Bathing Station. The main building will contain entrance hall, cloak rooms, offices, refreshment rooms, concert hall, central hall for exhibits, band stands, &c. The space to be enclosed will cover from six to nine acres, and will include promenade grounds. The general scheme of building will also provide for annexes for exhibits, as these may be required at contract prices. There will be an entrance for exhibits from Cotton-street. No price is fixed for the cost of the buildings, but it is desired that the maximum of space be combined with the minimum cost. At the same time the committee do not bind themselves to accept the lowest offer. The committee will adjudicate upon the plans, and in doing so may take the advice of a single adjudicator as they think fit. The successful com-

petitor will be allowed 5 per cent. commission on the cost of the buildings, which will include all necessary plans, specifications, and schedules of quantities. The competitor second in order will be awarded a premium of 20l. Intending competitors will have the ground pointed out to them any day between ten o'clock a.m. and four o'clock p.m. by applying to the superintendent at the Bathing Station. The exhibition will be open from June 1 to the end of September. All plans must be in the hands of the secretary, Mr. A. J. Brander, 5, Market-street, Aberdeen, not later than Wednesday, July 13, 1898. The plans will have no mark of identification on them, but will be accompanied by a sealed envelope containing the name of the competitor.

ARCHITECTURAL SOCIETIES.

DUNDEE INSTITUTE OF ARCHITECTURE.—On the 17th inst. the members of the Dundee Institute of Architecture, Science, and Art and their friends visited Strathearn. The party left the West Station, Dundee, at 8.20 in the morning, and within two miles of Crieff—at Innerpeffer Station—the company alighted. Thence they were driven in brakes two miles south, to Innerpeffer Library and Castle. The library and the adjoining chapel and graveyard were examined. Considerable interest was taken in the chapel, which is divided into three parts, the eastern division belonging to the Drummonds of Drummond Castle, the central to the Drummonds of Strathallan, and the western to Captain Drummond of Cromlix. The ruins of the castle were visited by the party, who thereafter drove to Abercainry House and grounds. Proceeding through the estate of Cultoquhey, the company were driven on to Crieff, where, in the Royal Hotel luncheon was provided. Mr. Leslie Ower presided, and Mr. Henderson, the secretary, acted as croupier. In the afternoon the drive was resumed, and Drummond Castle and gardens were visited, as were also the old church of Muthill and adjoining burial ground. The party were driven back through the avenue, and on to Muthill. The ruins of the old church and the tower met with considerable attention. Thereafter the company were driven back to Crieff. After tea, the return journey to Dundee was made by train.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—The annual meeting of the Royal Archæological Institute will be held at Lancaster this year, from Tuesday, July 19, to Tuesday, July 26. The President of the meeting is the President of the Institute, Sir Henry H. Howorth, and the following are the Presidents of the different sections: Antiquarian, Mr. R. Monroe; Architectural, Mr. J. T. Mickelthwait; Historical, Mr. J. Holme Nicholson. On July 19 a reception will be held by the Mayor in the Town Hall, and the President will deliver an address. St. Mary's Church and the Castle will be visited. July 20, visit to Furness Abbey and Piel Castle. July 21, drive through Kellet to Borwick Hall and Leven Hall. July 22, annual business meeting. Drive to Heysham. July 23, visit to Cartmel Priory, &c. July 25, visits to Halton, Cressingham, Mellington, Hornby, Cloughton, and the Crook of Lune. July 26, visit to Whalley, Mytton.

THE BIRMINGHAM ARCHÆOLOGICAL SOCIETY.—On the 11th inst. about twenty members and friends of this Society attended the first excursion of the season, which was to Shustoke and Nether Whitacre. Leaving the train at Shustoke, the church was first visited, under the guidance of the vicar. The next halt was made at Bolt's Green House. This half-timbered mansion-house bears the crest of the Digbys very prominently, and has many features of external interest. In the interior a carved stone chimney-piece and a panelled room are the chief objects of note. Nether Whitacre Hall, which was next visited, also proclaimed itself by the very prominent fleur-de-lis a seat of the Digbys. The house has been much modernised, but the ancient moat remains practically intact, and is in the highest degree picturesque. There are remains of three towers covering the bridges and in one case the remains are considerable. The old gateway opening upon the principal entrance is a very quaint half-timbered structure. The church of Nether Whitacre possesses an ancient tower, projecting from which are

several most curious gargoyles.—*Birmingham Post.*

LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.—The members of this Society, on the 13th inst., visited Wardley Hall, Worsley, which has lately undergone restoration. Mr. G. C. Yates (who led the party) read a paper in which he gave some historical account of the old building, and pointed out its more interesting features. When the work of restoration was commenced, he said, it soon became apparent that there was much more of interest in the house than was at first supposed. In all cases where there were beautifully panelled ceilings, formed of massive and richly moulded oak beams, it was found that the most prominent of the mouldings had been roughly chopped off, and on or below them had been nailed laths, and the whole hidden by plastered ceilings. Where the larger beams projected—all being of oak—they had been at some former period hacked over and covered with plaster, their sections being converted into plain rectangles, with chamfered edges, and (as if to add insult to injury) these "improved" beams had been painted and grained in imitation of oak. The fine old staircase had been similarly treated. The whole has now been restored as far as possible. Visitors to Wardley Hall, Mr. Yates said, will probably miss some of the black and white work with which they were so familiar, but as all that on the north front was sham—being painted plaster and not timber work at all—it was thought best not to replace it, but to restore the old brick walls which it covered. The restoration, though a costly matter, has resulted in saving from ruin one of the most interesting old houses in Lancashire.—*Manchester Guardian.*

ESSEX ARCHÆOLOGICAL SOCIETY.—On the 11th inst., the Essex Archæological Society met at the Chelmsford Railway Station, in connexion with the first summer outing. The party first visited Roxwell, where a visit was paid to the church, restored in 1854. A move was then made for Skreens. The mansion, a large, square red brick building, takes its name from a wealthy family named Skreens, who possessed it early in the fifteenth century. In 1635 it was purchased by Sir Jno. Bramston, and it has remained in the Bramston family ever since. After a brief stay here, and an inspection of some of the rooms and the garden, the party moved to Willingale. There are two parishes of that name—Willingale Doe and Willingale Spin, and they are said to derive their distinctive names from their owners soon after the conquest, William d'Ou and Hervey de Spin respectively. The curious thing about the two villages is that their churches stand in the same churchyard, about fifty yards apart, this being the only instance of the kind in Essex. Willingale Doe Church was first inspected, and a short sketch of its history was given by Mr. W. C. Waller. The church, it was explained, was probably built in the fourteenth century, but it has undergone many alterations. On the south side of the chancel is a huge marble monument to Sir Robert Wiseman (1641), of Torrell's Hall, and on the tomb is an ancient helmet. There are several brasses in the church, and these were described by Mr. Miller Christy. The church of Willingale Spin, which dates from the Early Norman period, was also inspected, and a paper on its origin and history was read by the Rev. C. Lennard Payne (rector). This building has also undergone alterations, and in 1748, the Rector said, it was made "as much like a white-washed barn as the wit of man could devise." From the Willingales the party drove to Fyfield, where the Rector, the Rev. L. Elwyn-Lewis, read a paper on the church, a large, ancient, and interesting structure, dedicated to St. Nicholas. From Fyfield the party drove on to Chipping Ongar, where some earthworks were examined and described.

THE WESTMINSTER BUILDING DISASTER.—At the Old Bailey, on Thursday, before Mr. Justice Grantham, Mr. C. J. C. Pawley, the architect of Abbey Mansions, Westminster, who was found guilty of manslaughter by the coroner's jury, surrendered to his bail. Mr. Gill, for the Treasury in the course of his remarks, said that the Treasury were not prepared to proceed with the prosecution. Mr. Justice Grantham, in summing up, said that he was of opinion that no liability attached to Mr. Pawley in any way, and that, practically, as there was no case against him, he would be acquitted. In the judge's opinion, the accident was due to the striking of the centring. Messrs. Ivory & Marshall appeared for Mr. Pawley.



London County Council Proposed Thoroughfare from the Strand to Holborn (from the Plan to accompany the Report of the Improvements Committee).

NOTE.—The dotted shading (blue in the original plan) shows improvements now being carried out.

LONDON BUILDING ACT, 1894: THE TRIBUNAL OF APPEAL AND THE DIAGONAL LINE.

At the Surveyors' Institution, Savoy Hill, Victoria Embankment, on Wednesday, a Tribunal of Appeal under the London Building Act, 1894—consisting of Messrs. Arthur Cates, A. A. Hudson, and J. W. Penfold—sat to hear an appeal made by Messrs. Walter Holt & Sons against the determination of the London County Council, by their resolution of May 24, not to sanction the extension above the diagonal line mentioned in Section 41 of the Act of a portion of a proposed building, namely, a block of residential flats to be erected upon a site called 12 and 13, and part of 11 and 14, D'Oyley-street, Chelsea—as shown on the plans deposited with the Council, dated May 10, and submitted with the amended application made on their behalf by Messrs. Bouchier & Galsworthy. Mr. C. E. Dyer, barrister, appeared for the appellants, and Mr. Seager Berry, from the Building Act Department of the London County Council, for the respondents.

Mr. Dyer, in opening his case, said they based their case upon Section 43, sub-section 2, which laid down that "If a person erecting the intended domestic building shall desire to deviate in any

respect from the plan or plans certified by the District Surveyor, it shall be lawful for him to apply to the Council, who shall sanction such deviations on such conditions as they may think fit, provided that such conditions shall not in any case be more onerous than the conditions prescribed for domestic buildings erected after the commencement of this Act abutting on a street formed or laid out before that date." Continuing, he maintained that their amended plans were submitted under this section. It could not be denied that they contained deviations from the plans submitted to, and certified by, the District Surveyor previously. To put their case in a sentence he would say that they had provided at the rear of the proposed buildings sufficient air space to satisfy the requirements of Section 41 (2), and that the Council sought to impose conditions which were more onerous than those prescribed by the last-named section.

Mr. Edward Bouchier, F.R.I.B.A., who acted as architect of the proposed building, gave evidence explanatory of the plans. In answer to Mr. Seager Berry, he adhered to his view that the horizontal line was drawn quite right.

Mr. Seager Berry, for the respondents, stated that so far as Section 43 was concerned there had been no material before the Council to enable them to

give a decision under that section. As he read the decision of the Council, there was nothing in it about Section 43; the only reason the appellants referred to that section was to show that they were inside the proviso of Section 41. The whole case hinged upon the building up of the vertical line.

Mr. Dyer contended that, having got his plans certified, he was entitled to avail himself of Section 43.

After some discussion, Mr. Berry, with the view to facilitate the hearing, waived several of his points and in the end the issue was narrowed to the question as to whether the appellants had or had not complied with the terms of the proviso in Section 41 and whether they were entitled, in interpreting that proviso, to draw the horizontal line actually from the ground level or from a height of 16 ft.

The Chairman said the point was one of some importance and the Tribunal would take time to consider their decision. This would be communicated to the parties when ready.

THE PROPOSED NEW STREET.

ANNEXED is the plan of the last and we trust the final proposal for the new street from Holborn to the Strand, which has been talked of so long, and for which so many schemes have been put forward and abandoned, that one has become tempted to think that it never will be carried out at all.

The plan sufficiently explains itself; it will be seen that the line of street avoids Lincoln's Inn Fields and cuts through a quantity of insanitary property, some of which however (shown by the dotted surfaces) has already been rebuilt, and it is very desirable that the line of street should be finally settled before any more rebuilding is taken in hand. The method of junction with the Strand and Fleet-street line seems satisfactory.

The Report has not yet come before the Council; we may go into it further in our next.

THE LONDON COUNTY COUNCIL.

THE London County Council met on Tuesday for the first time since the Whitsuntide recess, Mr. McKinnon Wood, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Wandsworth District Board 5,000*l.* for paving works; the Clerkenwell Vestry, 9,240*l.* for the purchase of land and the erection of buildings; the Greenwich District Board 2,350*l.* for street improvements; the Islington Vestry 2,950*l.* for purchase of premises so as to extend their electric lighting station at Eden-grove; the Kensington Vestry 17,500*l.* to purchase land for a parish depot at Wood-lane; the St. George's (Hanover-square) Vestry 14,000*l.* for wood paving; the St. Luke's (Middlesex) Vestry 11,860*l.* for paving works; the Lambeth Libraries Commissionaires 1,275*l.* for purchase of land; and the Camberwell Guardians 11,000*l.* for purchase of premises adjoining the infirmary.

The Building Act: Devolution of Powers.—A long discussion took place on a report of the Local Government and Taxation Committee on the question of transfers of powers from the Council to the Local Authorities, as suggested by the recent conference of representatives of the District Boards.

Mr. Costelloe, as chairman of the committee, said the report was an honest endeavour to transfer from the Central Authority everything which could properly be given to the Local Authorities.

The Earl of Onslow said the majority of them were agreed that there should be a greater measure of devolution in order to strengthen the spirit of local self-government, and he hoped the question would not be approached in a party spirit.

Mr. Dickinson urged that certain of these powers should not be transferred until the question of the constitution and powers of the Local Authority had been settled.

After further debate the report was received, and its various proposals were discussed. Seven recommendations were dealt with and six agreed to, the consideration of the remaining twenty-two being postponed in order to admit of other business being transacted. In our issue for May 21 are printed the proposals relating to the Building Act. The following recommendations were agreed to:—(a) "That the powers of the Council to remove posts and obstructions under Section 109 of the London Building Act, 1894, be transferred to the Local Authorities. (b) That the power of sanctioning

of refusing sanction to the formation of new streets rests in the first instance with the Local Authorities, it being left to the Council to confirm or reject the decision. (c) That the powers of the Council relating to the appointment of District Surveyors be not transferred to the Local Authorities. (d) That only the powers under Section 84 of the London Building Act, 1894, relating to the erection of wooden structures outside the City of London be transferred to Local Authorities. (e) That the powers of the Council to refuse to sanction plans of working-class dwellings where sufficient open space is not provided about such buildings be not transferred to the Local Authorities. (f) That the powers of the Council to consent to balconies, &c., and other projections beyond the specified distance be not transferred to the Local Authorities. Recommendation (f), "that the powers of the Council to take action where it is certified to the Council that a structure is in a dangerous state, or where a structure is neglected, and with a magistrate's order to repair or demolish these, and charge the cost to the owner, be transferred to the Local Authorities," was referred back; and the consideration of (h) and (j) was postponed.

On (c) Mr. Beachcroft moved, and Mr. Robinson seconded, the following amendment:—"That as the whole question of the position of District Surveyors in London, and their powers of control over buildings, requires the fullest consideration, it is undesirable to come to any conclusion at present as to who shall in future appoint them, and accordingly that the recommendation be referred back with an instruction to confer with the Building Act Committee in order that a full report on the question be laid before the Council."

Dr. Longstaff said he hoped that the recommendation of the committee would be recommended. The building law in London was very exceptional and very peculiar. He would be the last to say that it was the best possible law, or the best that they could hope for; but as to the appointment of District Surveyors, the question was very much bound up with that of areas. Any alterations in the system of appointment of District Surveyors could only follow when the local government of London was absolutely and definitely fixed in other respects. The local government was not so fixed, and he could not vote for the amendment.

Mr. Westacott said that he hoped that the recommendation would be referred back, for he thought that the present system of the payment of District Surveyors ought to be stopped, for it was a scandal. They ought to have a certain settled salary.

Dr. Longstaff said that would involve an alteration of the law, and had nothing to do with the transference of powers.

Sir John Hutton denied that the present system was a scandal, and it had worked very well in the past. District Surveyors were above suspicion, and they carried out their work most efficiently.

Lord Onslow said that he agreed that if a separate and independent inquiry were held into the position of District Surveyors—their emoluments and the manner of their appointment—a great deal of good would be done, but he did not agree with the proposal to refer the recommendation back.

Mr. Costelloe, chairman of the committee, said that he agreed that an inquiry might be held subsequently.

The amendment was then rejected, and the recommendation of the committee was agreed to.

Mr. H. Lawson moved to refer back (f) and the motion having been seconded.

Dr. Longstaff said that he had come to the conclusion that the powers referred to might very well be transferred, for the Local Authorities took a great interest in this class of work.

Mr. Burns supported the amendment, and said that in the case of the Westminster disaster, the Council had the necessary timber on the site about an hour after the accident, and he did not think it would be possible for a vestry to act so promptly.

The amendment to refer back was then agreed to.

On (g), Mr. Campbell moved and Mr. Westacott seconded, to refer the recommendation back. Surely, they remarked, the Local Authorities can be trusted in such little matters as balconies, &c.

The amendment, however, was rejected, and Dr. Longstaff then moved to insert the words

"of an architectural character" after the word "projection."

Mr. Howell J. Williams said that that would be confusing if agreed to, and he suggested the substitution of the word "structural" for "architectural." Dr. Longstaff agreed to this, but the amendment, on being put, was negatived.

The Sewage Commission.—On the reception of the report of the Main Drainage Committee, Mr. Beachcroft asked if the Council was watching the evidence being given before the Sewage Commission.

Mr. Penfold, the chairman of the committee, replied in the affirmative, adding that the Engineer and the Chemist had been instructed to attend and give any information they could.

Tramway Purchase.—The Council then proceeded to consider the question of the purchase of the undertaking of the London Tramways Company. On the motion of Mr. Benn, seconded by Mr. Westacott, the following resolutions were adopted, *nem. con.*:—(a) That a notice in writing, under the seal of the Council, be served upon the London Tramways Company, Limited, requiring the Company to sell to the London County Council, under the conditions and in the manner provided by Section 37 of the Metropolitan Street Tramways Act, 1870, and Section 48 of the Pimlico, Peckham, and Greenwich Street Tramways (Extensions) Act, 1870, the whole of the tramways, works, and undertakings authorised by the Metropolitan Street Tramways Act, 1869, the Metropolitan Street Tramways Act, 1870, the Pimlico, Peckham, and Greenwich Street Tramways Act, 1869, the Pimlico, Peckham, and Greenwich Street Tramways Act, 1870, and the Pimlico, Peckham, and Greenwich Street Tramways (Extensions) Act, 1870. (b) That the Clerk be instructed to apply to the Board of Trade for its approval to the terms of the foregoing resolution, and to serve the notice therein referred to so soon as the Board of Trade shall have signified its approval. (c) That it be referred to the Finance Committee to take the necessary steps to obtain the insertion in the Council's Money Bill of the year 1899 of a clause empowering the Council to raise the money required for the purpose of purchasing the said tramways, works, and undertakings.

The Smoke Nuisance.—The Public Control Committee brought up a report on the smoke nuisance, and recommended, "That the Public Control Committee be authorised to at once take proceedings in default of the Sanitary Authority in cases of nuisances from smoke, and to exercise the powers of the Council under Section 100 of the Public Health (London) Act, 1891; and that the Commissioner of the Metropolitan Police be asked to give such assistance as may be found necessary to enable the Council to put a stop to the serious nuisance of smoke in the County of London."

Sir Harry Poland said it was a great scandal that there should be a systematic violation of the law in this matter, and what they wanted was that the plain Act of Parliament should be enforced. At the same time, if the Council prospected other people they should see that they did not themselves offend in the matter of their own ferry and sludge boats on the river.

The recommendation was adopted.

Vauxhall Bridge—Rebuilding.—The Bridges Committee submitted the following statement:—

"The design which has been approved by the Council and the Thames Conservancy Board for the bridge that is to take the place of the present structure at Vauxhall involves a departure from the original conception, as it has been agreed to form a concrete bridge faced with granite in substitution for a steel-arched bridge. In such a structure the temporary centring has to be considerably stronger than in the case of a bridge with steel arches. By Section 37, sub-section 2, of the Vauxhall Bridge Act, 1895, it is provided that there shall be in the temporary work for the centre arch a clear waterway having a width of 70 ft. and a headway of 18 ft., and in the temporary work for the intermediate arches an opening having a width of 70 ft. and a clear headway of 15 ft. To enable the concrete arch to be constructed, the headway for the opening in the centre span will have to be decreased to 16 ft., but the headway for the intermediate spans can be practically the same as mentioned in the Act, though the opening will have to be reduced. The view taken by the Council's solicitor and the advisers of the Thames Conservancy Board is that, although in sub-section 1 of Section 37 it is left to the conservators to agree to alterations, it is doubtful whether they can give their consent to any variation with regard to the particulars mentioned in sub-section 2. From a conference which has taken place between the officers of the

Council and the Thames Conservancy Board, we have reason to believe that so far as the merits of the case go, the Board will not withhold their consent. We have therefore, on behalf of the Council, made a formal application to the Conservators for their consent to the modifications which are necessary to enable the centring for the granite-concrete arches to be erected, subject to the alteration by Parliament of sub-section 2 of Clause 37 of the Vauxhall Bridge Act. We therefore suggest that the Council should obtain Parliamentary sanction in the next Session to the reduction of the headway of the proposed bridge and the width of the waterway before referred to. By adopting this course the progress of the work in connexion with the building of the bridge will not in any way be delayed, as the work can be commenced as soon as the contract for the whole or any part of it is let. We recommend—That the Parliamentary Committee be instructed to insert a clause in one of the Council's Bills to be introduced in the next Session of Parliament, to authorise the Thames Conservancy Board to sanction such alterations as may be deemed expedient in the headway and the width of the waterway of the arches of the new Vauxhall Bridge."

The recommendation was agreed to. Mr. Ward, Chairman of the Committee, said that the temporary bridge would be opened the third week in July.

Waterloo Bridge—Southern Approach.—The same Committee reported as follows, the recommendation being agreed to:—

"We have to report that we have given further consideration to the question of carrying out the work at the arches in the southern approach to Waterloo Bridge, with the object of preventing leakage and strengthening the same. By the plan suggested we are advised that claims for compensation for interference are likely to arise. We propose, therefore, that only the spandrels shall be filled up solid to the crowns of the arches and covered with a layer of asphalt 1 in. in depth and a bed of protective concrete 6 in. in thickness. We are informed that this work will be sufficient for the purpose, and that it can be carried out at a cost of 10,780*l.*, which is about 1,000*l.* less than the estimate for the work which the Council has authorised to be carried out. We therefore recommend—That the order of the Council of May 17 last for repairing the arches carrying the southern approach to Waterloo Bridge be varied as above indicated, and that the work be carried out at the reduced estimated cost of 10,780*l.*

Street Improvements.—The consideration of the new street improvements and of county laws was adjourned, and the Council adjourned soon after seven o'clock.

BUILDING TRADES' EXHIBITION AT MANCHESTER.

ON Monday last a Building Trades' and Decorative Arts' Exhibition was opened in St. James's Hall, Manchester, by Mr. Robert I. Bennett, F.R.I.B.A., President of the Manchester Society of Architects. The exhibition is under the management of Mr. Albert P. Baker, and will remain open till July 9. Apparently it is a private venture, and perhaps this and the fact that no medals are awarded for the best exhibits, account for the incompleteness of the show. There are only 113 "stands" in all, and of these about fifty are occupied with exhibits which cannot be brought within the scope of a "Building Trades" Exhibition by the most vigorous stretch of imagination. Among them are the usual drapery stall, a palmist's and phrenologist's booth, two stands for ices and ice-creams, two for kinetoscopes and allied instruments, the manager's office, a tobacconist's stand, a weighing machine, and about a dozen stands for the display of railway company's views and advertisements. A few architectural drawings are spread out to form five "stands," and about half-a-dozen other exhibitors are credited with two stands each, we may say that only about half the stands are occupied with exhibits which come strictly within the scope of the exhibition. Even among these are some of only moderate interest, and few indeed possess much novelty.

In exhibitions of this sort, it would be convenient for serious observers if all the exhibits of each class were kept as close together as possible; thus, there might be a masonry section, a brickwork section, and others for sanitary fittings, drainage, joinery, ironmongery, ventilation, and warming, and so on. Such an arrangement would be of great service in enabling persons to find all the exhibits in that branch of the building trade in which they are interested, and it will probably

conduce to clearness if we roughly classify the contents of this exhibition in some such way.

The masonry section may be taken to include the natural stones of Joseph Brooke & Sons, Hipperholme, near Halifax (Stands Nos. 102 and 33A); of the Stonecliffe Estates Company, Limited, Darley Dale, near Matlock (Nos. 27 and 54); of John Fielding, Alton, Staffordshire (No. 87); and of J. Riddiough & Son, Bolton Woods, Bradford, Yorkshire (No. 48); and the granites of Kirkpatrick Bros. (No. 39); as well as the artificial stones manufactured by the Patent Victoria Stone Company, Limited, of London, and by the Hard York Patent Stone Company, of Lightcliffe, near Halifax. The Victoria stone is too well known to need description, but some of the specimens exhibited illustrate uncommon uses of the material; among these may be mentioned a pair of turned columns, about 8 ft. high, with moulded bases and caps, one of the shafts being polished, and two or three carved panels, which have the appearance of a rather coarse-grained natural stone. The "Non-slip" stone, of the Hard York Patent Stone Company, is made under a pressure of five hundred tons from the chippings of the York stone quarries at Lightcliffe and Hipperholme, &c.; it appears to be of uniform texture, and is made in two colours, known in the trade as "brown" and "blue." The price of the artificial flags made of this stone is said to be a little less than that of the natural York paving, and as the artificial stone is free from the objectionable flaking which is so common a feature of much York stone, it is likely to meet with a considerable measure of success. The natural stones already mentioned appear to be of good quality, Jos. Brooke & Sons' Lightcliffe stone being the densest and finest-grained; this stone is shown in the form of steps and flags, the latter being of the "Silex" brand.

The masonry section would also include part of the exhibit of the Buttermere Green Slate Co., Ltd. (No. 34). Besides green slates of various shades, this company shows part of a bay window constructed of green slate blocks, the effect of which would be enhanced by contrast with red brickwork.

Roof-coverings are exhibited by the Buttermere Green Slate Co. at Stand No. 34, by the Dublin Slating Co. (No. 32), A. Benson & Co. (No. 31), Halliwell & Co. (No. 55), and the British Slate Glass Co., Limited (No. 60). As the Dublin Slating Co.'s system of slating has recently been described in these columns, little need be said now; it consists in using slates which are (approximately) a foot square, with two opposite angles cut off, the splayed edges thus made being about 3 in. long, the slates are laid diagonally with the points at top and bottom, and with the splayed angles at the sides, and a lap of 3 in. is allowed under the two bottom edges of each slate. A considerable saving in slates is effected, the weight being about one-third less than in the ordinary system of slating, and as the labour of laying is also reduced, the method has the merit of economy. It has been used on several buildings in Ireland, and has, apparently given satisfaction, but we think the fussy appearance of the diagonal slating will militate against its use, except in cottages and works where strict economy must prevail. The same principle is applied to tiling.

A. Benson & Co. (No. 31) show the usual builders' stock of brick and terra-cotta goods, together with samples of Colthurst, Symons & Co.'s improved Roman roofing tiles, which possess undoubted advantages over the ordinary form; but, as they were patented in 1890, they cannot be said to possess much novelty.

Halliwell & Co., of Brighouse (No. 55), show their well-known systems of patent glazing and zinc roofing, in the form of a model. Vertical glazing forms part of the exhibit, and asbestos cords are placed in the grooves of the steel bars to prevent jarring and the ingress of dust.

Brickwork is not well represented. Benson and Co.'s exhibit (No. 31) has already been mentioned and calls for no comment. A model of Sercombe's Improved Perfect Barrel Brick-kiln (No. 13) is interesting, and as more than 200 are in use, we may assume that it is not without merit. Jabez Thompson, of Northwich (No. 71), has erected an ornate structure of bricks and terra-cotta, and also exhibits specimens of his "brickwood" bricks, which are not only very light, but are also fire-resisting and sound-resisting, and will take nails without splitting.

Doulton ware is shown at Stand No. 52,

among the specimens being a wall-fountain, an overdone mantel, and some good panels. Other glazed ware, pottery, and tiles may be seen at the stands of Williams & Co., Manchester (No. 43), Josiah Wedgwood & Sons, Etruria, Stoke-upon-Trent (No. 48), Martin van Straaten, of London (No. 105), and (according to the catalogue) the Della Robbia Pottery, Limited, of Birkenhead. Wedgwood's exhibit includes specimens of their well-known ware with white figures and enrichments on a basal ground, as well as tiles for floors and walls. Among the exhibits at Stand 43 is a quaint oak-mantel, one of the best-designed things in the room. A new and effective wall decoration is shown by Walter J. Pearce, Limited, at Stand 77. It is known as "Vitremure Mosaic," but the effect is very different from ordinary mosaic; it is much more like stained-glass leaded lights affixed to wall surfaces, the lead, however, giving place to a cement of some kind. The surface-finish may be "dull, encaustic, or glazed." Mr. Pearce is, we believe, his own designer, and, if so, we cannot but praise him for the excellent designs in which the new material is shown.

Stained glass and other methods of decoration are shown, not only by Mr. Pearce, at Stand 77, but also by R. S. Smethurst, Manchester (9); Robert Bennett, Manchester (50); Pink & Co., Manchester (44); Heaton Butler & Payne, London (66); Rust's Vitreous Mosaic Company, London (10).

Ornamental metal-work appears at Stands 104, 70, and 28, the last being the exhibit of George Wragge, of Salford, and containing several examples of great merit. The most important is one leaf of a pair of gates for Mr. F. W. Thomson, of Halifax, and designed by Mr. Edgar Wood, architect, Manchester. The design is exceedingly happy and the workmanship excellent; briefly, the gate consists of a trellis of flat hammered iron with large foliage in the spaces. In comparison with this, Messrs. Silcox & Reay's neat design for the commemorative tablets for the City of Bath appears almost commonplace.

Sanitary fittings do not form a large section, very few of the principal makers being represented. The best exhibit in this class is that of Morrison, Ingram & Co., of Manchester and Swadlincote (No. 67). The most important novelty is the hospital slop-sink with arrangements for flushing, and for washing bed-pans, &c., without handling them; the hopper and cistern are of enamelled fireclay, and the pipes and taps of copper and gun-metal. A good hospital lavatory with taps and waste actuated by treadles is shown, and also the "Bramstone" bath and lavatory for confined spaces in cottages and small houses, the lavatory being of buff glazed fireclay, and being placed over the foot of the bath; one pair of taps, by means of a small directing tap, is made to serve both fittings. An enamelled fireclay sink with strainer is shown, having two bib-taps at one end made to swivel so as to turn over a slop-sink, placed at the end of the wash-up sink.

The Exhibit and Trading Company of London (No. 20) shows porcelain-lined baths, "enamelite" baths, &c. A double water-closet seat is also shown, having an inner ring of wood hinged to the back of an ordinary seat, so that the closet can be conveniently used both by adults and children. A few Blatchford "drawn and compressed lead traps" are also included, this being actually the only exhibit of sanitary plumbing, if we except Cooper's "suction and vacuum pump" for removing stoppages in waste-pipes, &c. (Stand 79A). The exhibits at Stand 20 appear to be made in the U.S.A. An appliance mentioned in the company's catalogue is simple and useful, and deserves notice; it is the "Brander Jet Pump and Cellar Drainer," which is a device for raising water from foundations, &c., by means of a supply of other water at a pressure of about 10 lbs.; when the water in the foundations has been forced out to a certain depth, the supply of the other water is automatically cut off by the sinking of a ball-valve; should the water rise again, it raises the ball-valve and the pump is again brought into operation.

At Stand, No. 38, the Pure Deep Sea-Water Supply Company shows the "Atlantic" portable shower-bath, with lengths of hose for filling it either from the taps of the bath, by means of the ordinary pressure, or from the sea-water tank, by means of a force-pump. The apparatus is simple, effective, neat, and cheap.

The Mansfield Patents Company, of Notts (No. 76), shows the "Mansfield" wash-down

pedestal water-closet, which has the joint between the closet and the lead outgo of the trap made (below the water-line) by means of what was formerly known as Robinson's "Enable" collar. It is not without merit.

Drainage appliances are not well represented. There are only three exhibits of any importance, one of these being that of the Mansfield Company just mentioned, and the others being those of the Turton Moor Sanitary Pipe Company, Limited, Darwen (Nos. 85 and 86), and of the "Loco" Draining Apparatus Company, Limited, Manchester (Nos. 30 and 53). The latter company shows a number of apparatus of Mr. Lynde's invention, including a self-cleansing overflow and waste for lavatories and baths, a cast-iron stable-grid with strainer for straw, &c., traps of various kinds, the "Loco" drain-bag for removing projections of cement at the joints inside drain pipes, and a new and simple apparatus for preventing noise in syphon-cisterns.

Reversible windows are shown by the N.A.P. Windows Co. of Westminster (No. 57), W. G. & L. England, of Barnsley (Nos. 64 and 65), and the Easily-cleaned Window Co., of Shrewsbury (No. 18). The N.A.P. windows are already well-known to our readers, but the other two are both good and simple arrangements, England's being, perhaps, the better. In this the sashes are pivoted at the sides to sliding pieces attached to the usual cords, the weather being kept out by means of reverse rebates; in ordinary use the sashes are fastened to the sliding pieces by means of small sunk bolts. In the Shrewsbury window, each sash consists practically of a casement hinged at the bottom to an ordinary sash, and kept in position by means of two dog-eat-latches.

Ventilation is represented by the Northern Ventilating Company, Manchester (No. 35); J. Hamilton, Rochdale (No. 47); and S. Saunders, Manchester (No. 95); warming by S. Saunders (No. 95) and F. Spencer, Oldham (No. 88); electric-lighting, bells, &c., by Royce & Co., Manchester (Nos. 68 and 81); and J. Faulkner, Manchester (No. 70), (who also exhibits lightning-conductors; and silicate cotton by Fred. Jones & Co. (No. 37) and J. C. Broadbent & Co., Limited, Redcar (No. 90). A good stair-tread, consisting of indented india-rubber squares projecting up through an iron, brass, or gun-metal frame, is shown by W. Gooding, London (No. 51), and there are several exhibits of gas-stoves, &c.; the "Fryston" coal-fire kitchen-range, which possesses some excellent features, is also at work (No. 100).

Little remains to be said. Most of the exhibits have been noticed. A few mentioned in the catalogue were not in position at the time of our visit, and some have perhaps been accidentally overlooked, but at the best some branches of the "building trades and decorative arts" are not represented at all in the exhibition, while others are only a little better off. Many of the best firms are conspicuous by their absence, and many of those who exhibit are not seen at their best. It is doubtful whether exhibitions of this sort should be left to private enterprise. Perhaps some day the Manchester Society of Architects will undertake one; if they do, the result will be a greater success than the present exhibition can boast.

Illustrations.

PORTRAIT OF PROFESSOR AITCHISON.

WE have usually been in the habit of giving the portrait of the recipient of the Institute Gold Medal with the issue containing the report of the meeting at which it was presented; and we accordingly give in this number the portrait of Professor Aitchison, from a photograph which he was kind enough to lend us for the purpose.

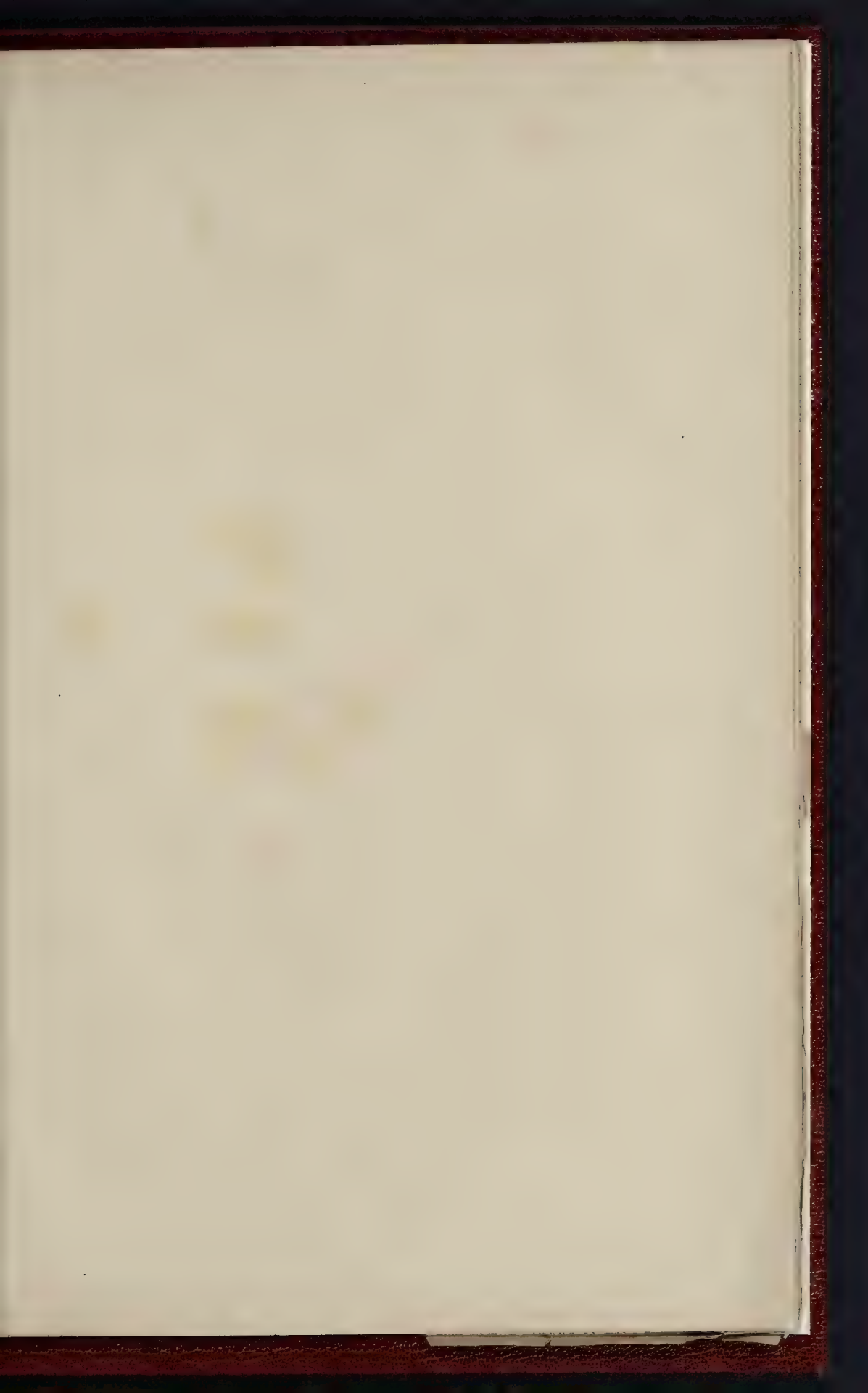
PROPOSED BUILDING ON THE SITE OF CHRIST CHURCH, BIRMINGHAM.

OUR readers will remember that there has been a considerable controversy as to the question of retaining or pulling down Christ Church, the eighteenth century church the tower and spire of which formed such a prominent object in the most central part of Birmingham. We very much regret that the decision has been come to to pull it down, though it must be admitted that the body of the church was of no interest or architectural



Professor Aitchison, R.A., P.R.S.P.A.

ROYAL GOLD MEDALLIST, INSTITUTE OF ARCHITECTS, 1878





SKETCH DESIGN FOR PROPOSED BUILDING

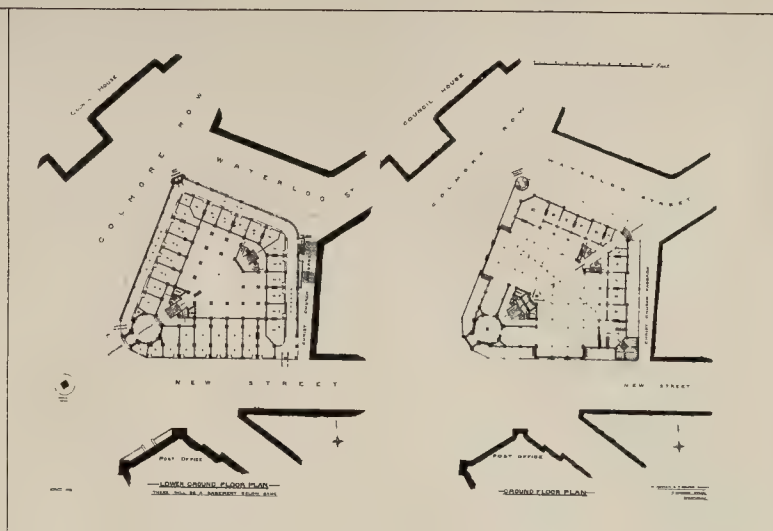
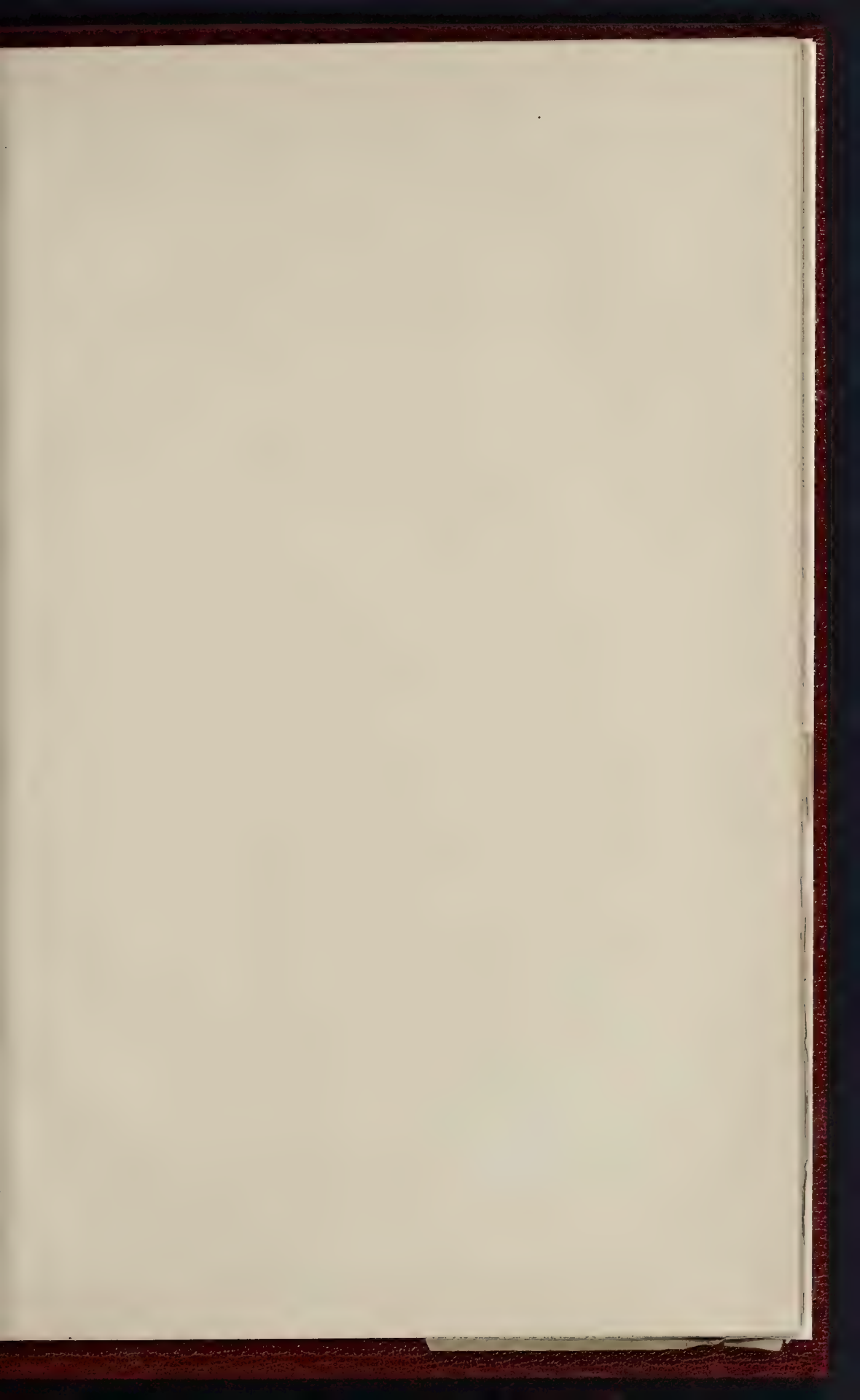
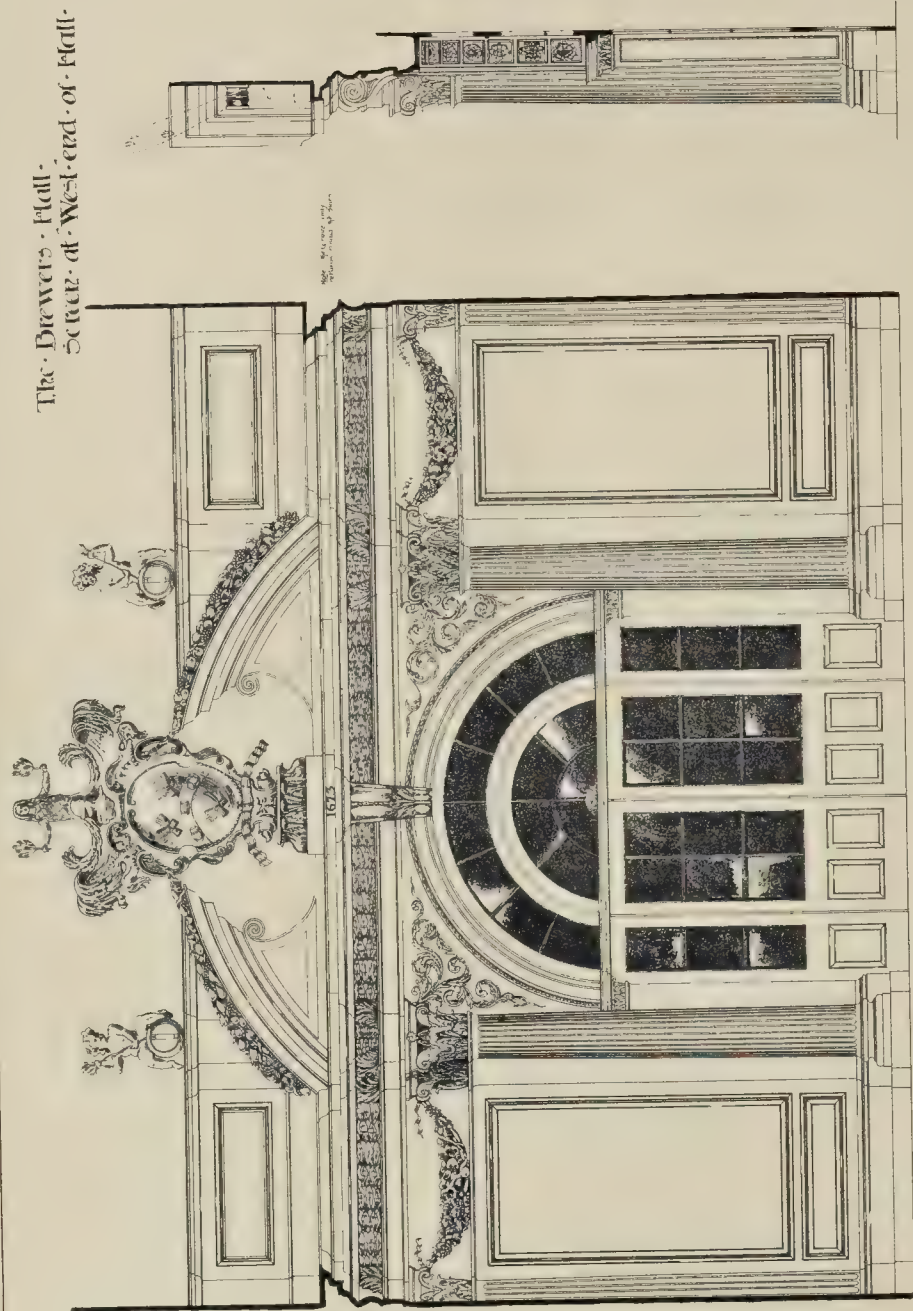


PHOTO LITHO SPRATUE & CO. 465 EAST HARDING STREET PETER LANE, E.C.

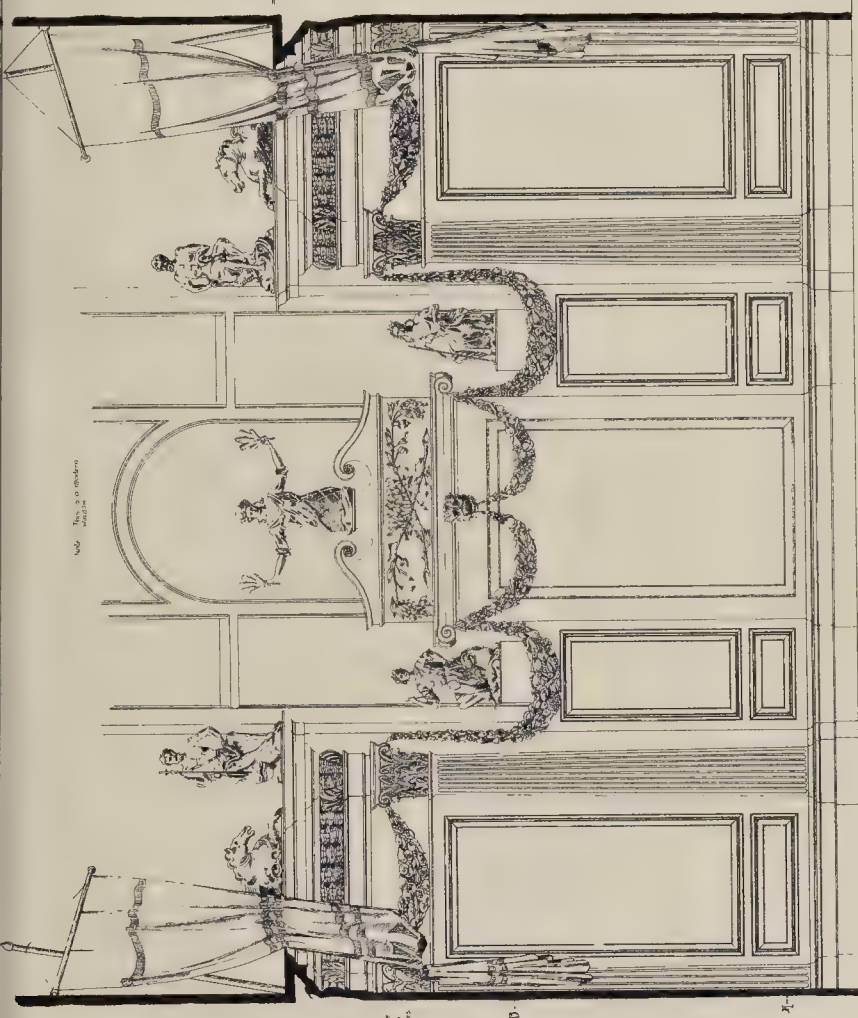


THE BUILDER, JUNE 25, 1898.



Section

The Brewers Hall East end of Hall



Note: This is a modern
drawing.

Only the
drawing
shown by artist.

Darkey on S. side of the Hall



Half Floor at q

Half Floor at p

PHOTO. J. H. SPRIGUE & CO. 177 N. E. 8. E. EAST HAD. NO. STREET, PETER LANE, E. C.

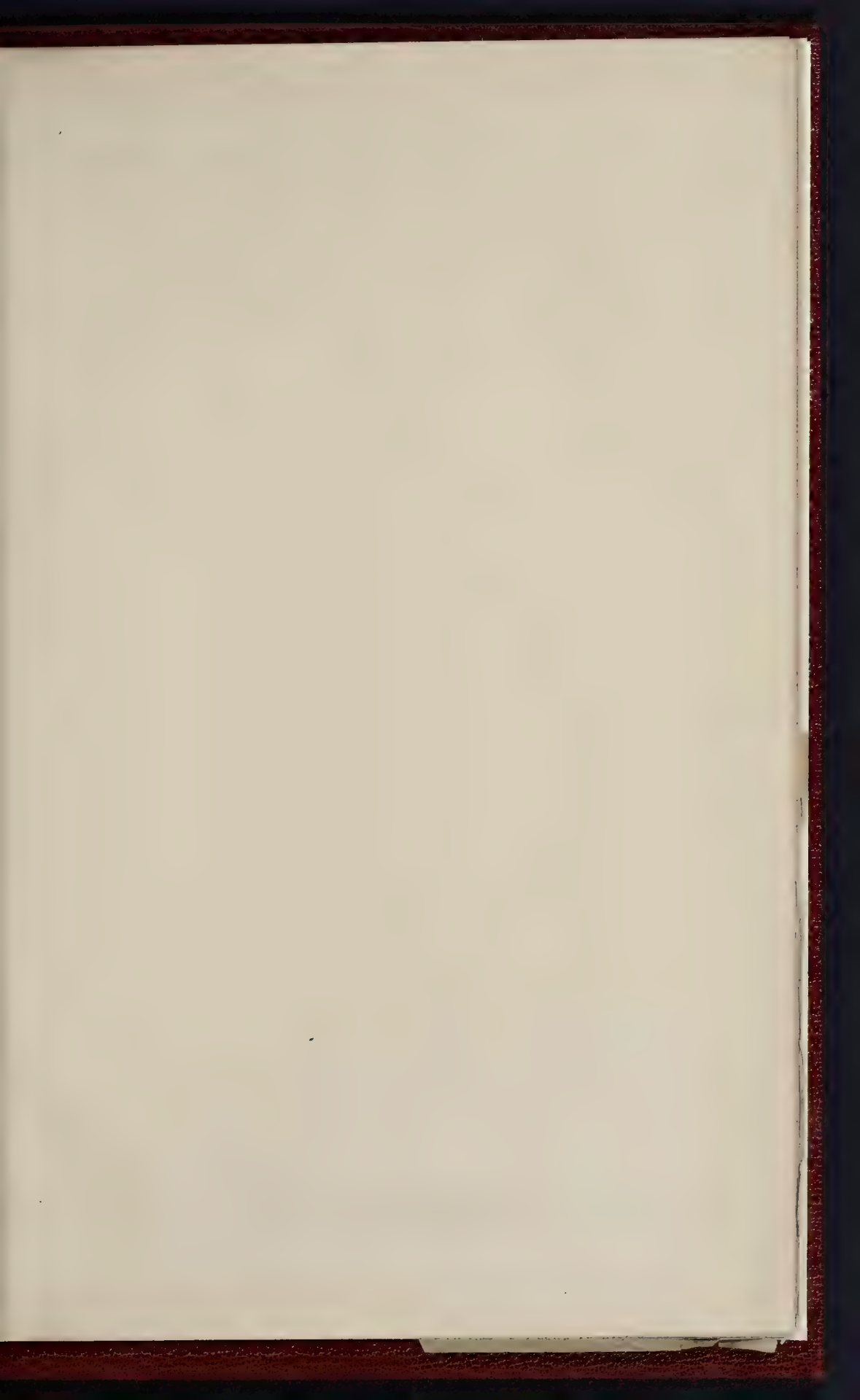


Half Floor at D



Half Floor at K

THE SCREEN, BREWERS HALL.—MEASURED AND DRAWN BY MR. H. F. WARING.





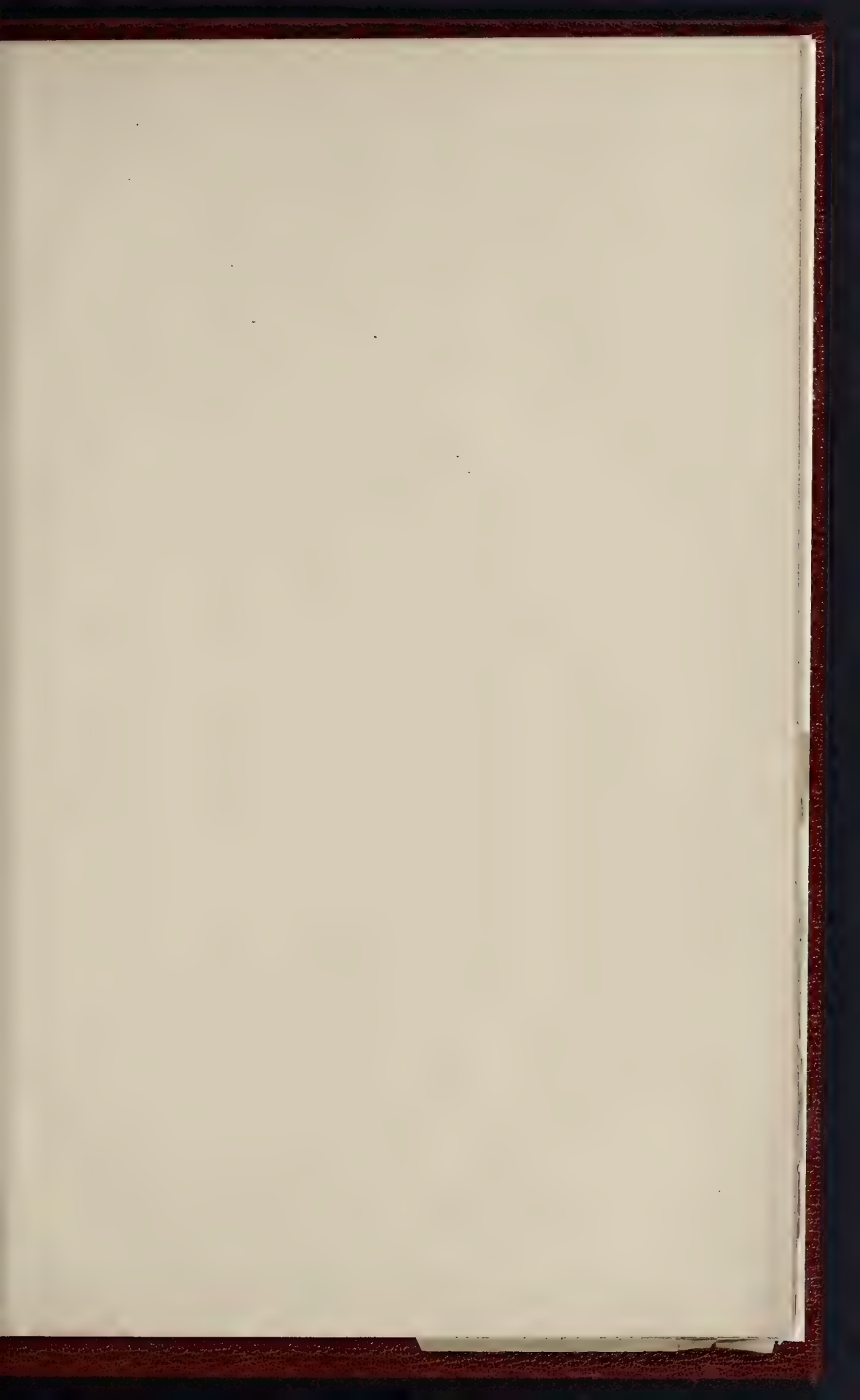
"PERSEUS": BY MR. F. W. POMEROY.



"THE GIRDLE" BY MR. W. R. COLTON.



"EVEN" BY MR. ALFRED DRURY.





DESIGNED BY THE LATE SIR E. BURNE-JONES, 1898. EAST HARDING STREET, FETTER LANE, E.C.

"INTEMPERANTIA": FROM A CARTOON FOR A STAINED GLASS WINDOW BY THE LATE SIR E. BURNE-JONES.



"STULTITIA": FROM A CARTOON FOR A STAINED GLASS WINDOW BY THE LATE SIR E. BURNE JONES.

value; had this been otherwise, perhaps the church might have been saved.

The illustration shows the sketch (for it is not to be considered a matured design) by Messrs. Hedmann Cooper for the building to be erected on the site of the church. The architects, as will be seen, provide something in the shape of a tower to take the place of the church tower. The plans provide on the ground floor for thirty shops. Under the shops will be an extensive basement, and above, the whole of the ground floor is occupied by a large Exchange Hall, with two good entrances from New-street and Waterloo-street. The hall is to be lighted on two sides by large windows, and a central glazed dome 50 ft. in diameter. Above the ground floor are three upper floors of offices, and a fourth floor, to contain some offices and the caretaker's apartments. There will also be constantly moving lifts, so that at any time people can travel up and down without having to wait for attendants. The elevations are intended to be executed in Portland stone throughout.

The architect's estimate of cost is 100,000.

THE SCREEN, BREWERS' HALL.

The measured drawings of this screen, a fine piece of work in the taste of its time, were made by Mr. H. F. Waring. This, and the two drawings of a bracket and an Italian mantel-piece, from South Kensington Museum, which were published among the plates in our last issue, were the principal among the drawings which gained Mr. Waring the Architectural Association Travelling Studentship, as mentioned in our columns the other day.

SCULPTURE AT THE ROYAL ACADEMY.

The three examples of Royal Academy sculpture illustrated this week are "Perseus," by Mr. F. W. Pomeroy; "The Girdle," by Mr. W. R. Colton; and "Even," by Mr. Alfred Drury, the latter one of a series of eight candelabra to be erected round the new central place at Leeds. The works are further referred to in an article on Sculpture at the Royal Academy in another column.

CARTOONS FOR STAINED GLASS, BY THE LATE SIR E. BURNE-JONES.

The cartoons from which these illustrations are taken were made by the artist as designs for stained glass windows. They represent, under allegorical figures, the ideas of "Intemperance" and "Folly." They are mentioned in the article on the late Sir E. Burne-Jones on another page of this issue.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Finsbury, East.—A variation from the plan, sanctioned on June 25, 1895, for the erection of an electric central station at Oak Wharf, City-road, St. Luke's, at the corner of Graham-street (Mr. C. S. Petch for the County of London and British Provincial Electric Lighting Company, Limited).—Consent.

Newington, West.—A one-story shop on the forecourt of No. 137, New Kent-road (Mr. R. Ridley for Miss H. C. Smith and Miss M. D. Smith).—Consent.

Rotherhithe.—A wood and iron gateway erected across Rotherhithe-street and connecting No. 10 with the warehouse on the opposite side of that street (Mr. E. Crosse for Messrs. R. Candlish & Son).—Consent.

Wandsworth.—One-story additions to the "Prince of Wales" public-house, Garrett-lane, to abut upon Summers-town (Mr. C. H. Flack for Mr. J. B. Thomson).—Consent.

Marlybone, West.—A porch on the south side of the "Crown" public-house, Nos. 23 and 24, Aberdeen-place, St. John's Wood (Mr. C. H. Worley for Mr. F. Crocker).—Consent.

Deptford.—A projecting bay window, pilasters and cornice, erected at the "Royal Albert" public-house, No. 400, New Cross-road (Messrs. Hicklin, Washington, & Pasmore for Mr. R. Rice).—Consent.

Deptford.—A one-story shop upon part of the fore-

court of No. 178, New Cross-road (Mr. J. Prentice for Mr. C. Ranford).—Consent.

Dulwich.—Four houses on the south side of Herne-hill, between St. Paul's Church and Simpson's-alley (Mr. F. T. White for Mr. F. W. Russell).—Consent.

Dulwich.—An inclosed porch in front of Dulwich-hall, Hindman's-road, East Dulwich (Mr. E. Webb for the Dulwich-hall Mission).—Consent.

Finsbury, Central.—Bay windows to four houses on the south side of Alexandra-park-road, at the corner of Muswell-avenue, Muswell-hill (Messrs. Gill Brothers).—Consent.

Hatchway, South.—Buildings on the south side of Lea-bridge-road, eastward of Thistlewhite-road (Messrs. F. Chambers & Son for Messrs. Longbourne, Stevens, & Powell).—Consent.

Fulham.—A porch at No. 753, Fulham-road, to abut upon Epple-road (Mr. H. Burridge).—Consent.

Hammermith.—An iron and glass shelter in front of the Hammermith Theatre of Varieties, King-street (Mr. W. M. Bruton for Mr. J. C. Coe).—Consent.

Kensington, South.—That the consent of the Council, granted on May 24 last, to the erection of an open portico at the entrance to No. 18, Cromwell-place (Messrs. Langdale, Hallett, & Co. for the Union Bank of London, Limited) be modified by the omission of the words "that the present portico at the premises be removed upon the completion of the new portico"; and that Mr. F. N. Hornby, who applied for the modification referred to, be informed that the Council is not prepared to grant any further variation of the aforesaid consent. Agreed.

Lewisham.—An addition to the ledge at the recreation grounds in Mayow-road, Forest-hill (the Lewisham District Board).—Consent.

Marlybone, East.—Portico erected in front of No. 80, Newman-street, Oxford-street (Mr. J. Slater for Mr. Lawrence).—Consent.

Paddington, North.—Two two-story bay windows in front of No. 100, Maida-vale (Messrs. J. T. Wimperis & Arber for Mr. W. H. Arber).—Consent.

Dulwich.—The rebuilding of No. 182, Underhill-road, East Dulwich, with a one-story shop in front to abut also upon Upland-road (Mr. J. A. G. Knight for Mr. G. R. Burn).—Refused.

Lambeth, North.—Buildings upon the site of Nos. 135, 138, 140, 142, 144, and 146, Kennington-road, and the widening of part of Walnut-tree-walk (Messrs. Waring & Nicholson for the trustees of the Lambeth Walcott Charity Estate).—Refused.

Paddington, North.—An iron and glass covered way on part of the forecourt of No. 2a, Blomfield-road, Meida Hill (Messrs. Densham & Sons for Mrs. Matland).—Refused.

Strand.—Balconies at the second floor level and oriel windows at the first and second floor levels of the "Lord Belgrave" public-house, No. 60, Whitcomb-street, at the corner of Spur-street (Mr. C. H. Flack for Mr. R. Ireland).—Refused.

Westminster.—Bay windows to a block of residential flats on the north-east side of Carlisle-place, at the corner of Francis-street (Mr. G. Baines for Mr. G. Martin).—Refused.

Strand.—A porch in front of No. 1, Cockspur-street, Fall-mall (Messrs. Hampton & Sons, Limited).—Consent.

Strand.—A portico at, and an oriel window on the second floor level, of a proposed block of chambers on the site of Nos. 88, 89, and 90, Chancery-lane (Messrs. Waterman & Lewis for Mr. N. Fortescue).—Consent.

Strand.—Three bay windows and an angle turret to a proposed addition to the Prince's Restaurant, on the site of Nos. 35, 37, and 38, Jermyn-street, St. James's (Messrs. J. T. Wimperis & Arber for the Prince's Hall Restaurant, Limited).—Consent.

Wandsworth.—That the consent of the Council on May 10, 1898, to the erection of houses on the west side of St. Ann's Hill and The Grove (Mr. G. E. Withers for Messrs. Withers & Son) be modified by the omission of the words "that no bay window or other projection whatever be erected or made in advance of the houses."—Agreed.

Kensington, South.—An iron and glass pent over the entrance to No. 42, Campden Hill-square (Messrs. B. Colley & Sons for Mr. J. Carille McCoan, J.P.).—Refused.

City of London.—A stone corbel to support a sign in front of No. 26, Holborn (Messrs. Treadwell and Martin, for Messrs. James Buchanan & Co.).—Refused.

Marlybone, West.—Rebuilding of the "Pontefract" public-house, No. 88, Chapel-street, Marlybone-road, to abut also upon Marlybone-road (Mr. T. Wilson, for Mr. W. Holman).—Refused.

Lewisham.—A lady-chapel, &c., in Comerford-road, Brockley, and a church on the south side of Howson-road, to abut upon Comerford-road (Mr. J. Bole for the committee of the proposed Catholic church of St. Mary, Brockley).—Refused.

Rotherhithe.—A theatre on the site of Nos. 32, 34, and 36, Lower-road, to abut also upon Culling-road (Mr. W. G. R. Sprague for Messrs. Marier & Saunders).—Refused.

St. Pancras, North.—Baths and wash-houses on the north side of Prince of Wales-road, Kensitown, between Grafton-road and Wiles-road (Mr. W. N. Blair for the Vestry of St. Pancras).—Refused.

Kensington, South.—That Messrs. J. W. Morley &

Letts be informed that their application on behalf of Mr. J. Buckle for the consent of the Council to the erection of a one-story shop on part of the forecourt of Jasper House, Earl's-court-road, having been further considered, the Council sees no reason to depart from its decision of May 3 last not to grant the application. Agreed.

Clapham.—A one-story shop on part of the forecourt of No. 262, Wandsworth-road, at the corner of New-road (Mr. S. Wilkinson).—Refused.

Dulwich.—One-story shops on part of the forecourts of Nos. 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, and 90, Lordship-lane (Mr. R. A. Hinds for Mr. G. H. Judd).—Refused.

Fulham.—One-story shops upon the forecourts of Nos. 663, 665, and 667, Fulham-road (Mr. F. W. Potter).—Refused.

Greenwich.—Houses with shops on the south-east side of Wellington-road, Old Charlton, near the Wellington public-house (Mr. P. Green for Mr. J. Ellis).—Refused.

Hackney, North.—A conservatory at No. 307, Seven Sisters-road, Stoke Newington, to abut upon Woodberry-grove (Mr. R. Maskall for Mr. H. Sprake).—Refused.

Hammermith.—One-story shops in front of Nos. 202, 204, 206, 208, 210, 212, 214, and 216, King-street West (Mr. A. M. Naylor).—Refused.

Kensington, South.—An enclosed porch in front of No. 2, Cottesmore-gardens, Victoria-road (Mr. S. R. Tatham for Mr. H. W. Simpkinson).—Refused.

Kensington, South.—An addition at the rear of No. 206, Fulham-road, to abut upon Finborough-road (Messrs. Nichols Bros. for Mr. P. Webster).—Refused.

Kensington, South.—A block of buildings with projecting bay windows, &c., at Hyde-park-gate, on the south side of Kensington-road, to abut also upon Palace-gate (Mr. B. Hosegood).—Refused.

Lewisham.—Six houses with one-story shops on the north side of Stanstead-road, Catford, with the flank of the easternmost building to abut upon Stanstead-grove (Mr. A. C. Baker for Mr. W. A. Jewell).—Refused.

Newington, West.—One-story shops upon part of the forecourts of Nos. 154, 156, 158, 160 and 162, Millworth-road (Mr. C. Truissall for the Midland Railway Company).—Refused.

Notwood.—A block of residential flats on the east side of Upper Tulse-hill, at the corner of Wimbert-road (Mr. E. Loader for Mr. H. Loader).—Refused.

Strand.—An oriel window at the first, second, and third floor levels of a block of residential flats on the north side of Cranbourne-street, at the corner of Ryder's-court, and the erection of projecting balconies at those premises (Mr. F. Matcham for the London Hippodrome Company, Limited).—Refused.

Wandsworth (Detached).—A school-keeper's house on the east side of Rosendale-road, at its junction with Turney-road (Mr. T. J. Bailey for the School Board for London).—Refused.

Wandsworth.—Twelve shops on the site of The Hawthorns and grounds, on the west side of Balham High-road, with the flank of the southernmost shop to abut also upon Marius-road (Mr. F. Perks for Mr. A. Simpson, M.A.).—Refused.

Wandsworth.—A house on the south side of Lewin-road, Streatham, to flank upon Ellison-road (Messrs. Daniels Brothers).—Refused.

Woolwich.—A house on the north side of Brewery-road, Plumstead, to flank upon Miriam-road (Mr. A. H. Kersey).—Refused.

Width of Way.

Whitechapel.—A house, with shop, on the north side of Pellam-street, Mile-end New-town, with the flank wall at less than the prescribed distance from the centre of Hunt-street (Messrs. Davis Brothers).—Consent.

Chelsea.—A one-story farrier's shop upon the site of Nos. 40, 42, and 44, Green-street (Mr. J. Emes for Mr. W. J. Smith).—Refused.

Linchew.—Two warehouses on the site of No. 75, Wapping-wall (Mr. E. A. B. Crockett for Messrs. Anderson, Weber, & Smith).—Refused.

Islington, West.—A warehouse and factory on the east side of Paradise-court, Sheringham-road, Liverpool-road (Mr. H. O. Ellis for Mr. A. F. Lundberg).—Refused.

Deviation from certified plans.

Finsbury, Central.—Deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of No. 60, Rosoman-street, Clerkenwell (Messrs. W. A. Aickman and J. K. Bate-man for Mr. H. H. Finch).—Refused.

Holborn.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of Nos. 116, 118, 120, 122, 124, 126, 128, 130, and 132, Oxford-street, and Nos. 1, 3, 5, 7, and 9, Wells-street (Mr. J. Slater for Messrs. Salaman & Co., Limited).—Refused.

Marlybone, East.—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of Nos. 116, 118, 120, 122, 124, 126, 128, 130, and 132, Oxford-street, and Nos. 1, 3, 5, 7, and 9, Wells-street (Mr. J. Slater for Messrs. Salaman & Co., Limited).—Refused.

Holborn.—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

London Building Act, 1804, so far as relates to the proposed erection of a block of residential flats on the site of Nos. 33 and 33a, Red Lion-square, and No. 11, Old North-street (Mr. E. J. Stubbs for Messrs. T. Millman & Co.).—Refused.

Line of Fronts and Width of Way.

Bermundsey.—Frontage of a one-story addition proposed to be erected upon part of the forecourt of the "Grange" public-house, No. 104, Grange-road, and the erection of an addition at the rear of that building (Mr. E. J. Capell for Messrs. Truman, Hanbury, Buxton, & Co., Limited).—Refused.

Norwood.—A house on the north side of Durham-road, West Norwood, to flank upon Eden-road (Mr. T. J. Wallis).—Refused.

Width of Way and Space at Rear.

Southwark, West.—That the Council, in the exercise of its powers under Sections 13, 41, and 207, do not consent to, or permit of, the erection of a five-story addition at No. 31, Bennett-street, Stamford-street, to abut upon Bennett's-mews (Messrs. J. D. Matthews & Son for Messrs. Cook, Son, & Co.).—Agreed.

Southwark, West.—That consent be not given to the position of a building proposed to be erected over a gateway on the east side of Ewer-street, adjoining St. Saviour's public baths; and that the Council in the exercise of its powers under Section 41 of the London Building Act, 1804, do not permit the erection of a three-story stable and store on a site, on the east side of the public baths, Lavington-street, approached by a passage-way out of Ewer-street, without an open space at the rear (Mr. G. E. Lewis, for Mr. C. A. W. Giles).—Agreed.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. P. Meredith, sanctioning the formation or laying out of a new street, for carriage traffic, between Westlands-road and Balham Hill. That the name Hazlebourne-road be approved for the new street.—Agreed.

Means of Escape at Top of High Buildings.

Marylebone, West.—That Messrs. Metcalf & Greig be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1804, is not prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the sixth floor of Abbey-court, No. 47, Abbey-road, St. John's Wood (for the Mansions Estate Company).—Agreed.

Holborn.—That Mr. G. D. Martin be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1804, is prepared to grant a certificate in respect of the means of escape, in case of fire, to be provided for the persons dwelling or employed on the fifth and sixth floors of Pitman's Metropolitan School of Short-hand, &c., on the east side of Southampton-row, Bloomsbury (Sir Isaac Pitman & Sons, Limited).—Agreed.

Marylebone, West.—That Mr. W. H. Scrymgeour be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1804, is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth floors of blocks Nos. 2 and 4, Bickenhall Mansions, Marylebone-road.—Agreed.

Buildings for the Supply of Electricity.

Norwood.—That the Council do approve of the plans submitted with the application of Messrs. Kincaid, Waller, & Manville for the South London Electric Supply Corporation, for the construction of a generating station and works on a site adjoining Bengeworth-road, Loughborough Junction.—Agreed.

Extension above Diagonal Line, &c.

Kensington, South.—That sanction be not given to a modification of the provisions of Part V. of the London Building Act, 1804, with regard to the extension above the diagonal line as directed to be drawn by Section 41 of that Act, so far as relates to the erection of two blocks of residential flats on the west side of Wright's-lane, Kensington High-street, with the rear portions of such blocks to abut upon Iverna-gardens and to extend above such diagonal line, and that the Council under Section 49 of the Act do not consent to the erection of seven other blocks of flats to front upon Iverna-gardens, to exceed in height the distance of the front of such buildings from the opposite side of the street (Messrs. Metcalf & Greig for the Mansions Estate Company).—Agreed.

Artisans' Dwellings.

Lambeth, North.—Two blocks of intended dwelling-houses to be inhabited by persons of the working-class, and proposed to be erected, not abutting upon a street, on a site on the north side of Roupell-street, Lambeth (Messrs. W. Cubitt & Co., for the Trustees of the Peabody Donation Fund).—Refused.

The recommendations marked † are contrary to the views of the Local Authorities.

Correspondence.

To the Editor of THE BUILDER.

INSURANCE FOR WORKMEN.

SIR,—In reply to your correspondent, "Assurance," on page 589 of last week's *Builder*, the difficulty experienced by him with reference to compensation of workmen through illness was felt some years ago in the firm in which I am employed.

To obviate this a meeting of the employees was called by the employer, and, after discussing various ways, the following was adopted:—

A President, treasurer, and secretary and committee were appointed.

The employer was nominated President (I am citing this particular case), the foreman painter treasurer and secretary, with a small committee of men.

A code of rules was drawn up, and the working of the "Sick Club"—as it was styled—practically amounted to this:—

The weekly subscription was 3d.

Upon illness the sick member was required to furnish satisfactory evidence of his inability to attend work, and on doing so he was paid out of the funds at the rate of 10s. per week—one day being the smallest limit allowed.

At the end of the year a general meeting was held to make any alterations in officers and rules deemed necessary, and the funds in hand were shared out (with the exception of 1l. for emergency), each member receiving such of his subscriptions as he was entitled to, according to the amount of benefit he had received in the past year.

This arrangement overthrew the one-sided policy on which so many clubs are worked, where a member continually paid in, and whether he had illness or not it made no difference to him financially at the end of the year.

I may mention that this system has been practised now for several years, and never has the "club" been in a needy state.

I trust that your correspondent may find this plan useful, to modify according to his own particular circumstances. A. E. DAVIS.

RED ANTS.

SIR,—One mode of getting rid of these pests has come under my notice, which has proved very fairly effective, I believe.

There were two or three adjoining houses that almost swarmed with these insects, and when one became unoccupied the landlord had the floors (both wood and stone) removed, and the under surface covered with a solution of chloride of lime—a fairly strong solution. I believe this proved very effective, almost driving the whole lot of ants away.

H. BELL JOHN, F.A.S.I.

SIR,—A few months ago I was troubled with ants, as your correspondent is, and as a last resource I poured paraffin about where they were. The smell from this for a fortnight or so was very disagreeable, but it drove away the ants. I should also advise Mr. King to pour paraffin all round the external walls of the house, and especially against any floor ventilating gratings, and to put jars with a little treacle in where the ants are thickest. When there is a good catch in the jars drown them in hot water. Under this treatment I expect the houses will soon be quite free of them.

S. G. N. MANN, Surveyor.

Ashridge Estate.

P.S.—I can strongly recommend Jaeger's "Odoricide" burning pure spirits of wine to take away the smell of the paraffin should people be living in the house at the time. It can be obtained from all the Jaeger Company's depots, or 95, Milton-street, E.C., price 6s. 6d.

METROPOLITAN ASYLUMS BOARD.—At the meeting of the Metropolitan Asylums Board last Saturday, a letter was read from the Local Government Board stating that they had given consideration to the managers' proposal to obtain tenders for the erection of new chief offices without advertising for sealed tenders, and did not consider "the reasons at present assigned as sufficient to justify them in consenting to the proposed departure from the regulations." The Works Committee, reporting in respect to the proposed new southern hospital, stated that as instructed by the Board on June 10, 1897, they invited fifteen selected firms of architects to submit plans for certain portions of this hospital. Of these fifteen firms, ten only responded to the managers' invitation and sent in designs which the managers considered most creditable to the authors and of great uniformity of merit. As the result of their examination of them, in which they had had the assistance of the assessor, Mr. Henry Currey, they had selected three as most worthy, and recommended that 150l., 100l., and 50l. be awarded respectively to the authors of the designs marked A, I, and J, this being the order of merit in which such plans have been placed. This was agreed to.

The Student's Column.

THE CALCULATION OF STRENGTH OF MATERIALS AND RESISTANCES.—XXVI.

WE cannot better conclude this series of articles than by giving some tables of the strength of materials and other data useful in making calculations. These are compiled from various authorities.

CRUSHING WEIGHTS OF MATERIALS.

Timbers (average).	Tons per square inch.
Ash	3½
Beech	4
Box	4½
Cedar	2½
Chestnut	2½
Ebony	3
Elm	2½
Fir (Spruce)	6
Greenheart	6
Jarrah	3
Lignum Vitæ	4½
Mahogany	3½
Maple	3
Oak	3½
Pine (Baltic fir)	3
" (American white)	2½
" (American red)	3
" (pitch)	2½
" (Georgia)	3½
" (Kauri)	3
Teak	4
Walnut	3½

These figures vary in different specimens as much as one-third, more or less.

Stones and Other Walling Materials.

	Tons per foot super.
Granites	300 to 1,200
Hard limestones and marbles	250 to 1,000
Oolitic limestones	100 to 250
Sandstones	150 to 550
Bricks (single specimens)	20 to 30
Brickwork in mortar	20 to 30
" cement	50 to 70
Portland cement (neat)	75 to 150
Concrete of Portland cement, sand, and ballast, one month old	12 to 18
Do. Six months old	48 to 72
Do. Twelve months old	74 to 120
Lime concrete, about ¼ as much as Portland cement concrete.	

Metals.

	Tons per square inch.
Cast Iron	30 to 50
Wrought Iron	16 to 20
Steel (mild)	25 to 45
" (hard)	38 to 90
Copper	40 to 50
Brass	45 to 70
Lead	3 to 4

TENSILE BREAKING WEIGHT OF MATERIALS.

Timber (average).

	Tons per square inch.
Ash	4½
Beech	3½
Box	6
Cedar	3
Chestnut	5
Elm	3
Fir (Spruce)	3
Lignum vitæ	4
Mahogany	4½
Maple	4
Oak	4½
Pine	3
Teak	5
Walnut	3½

Stones.

	Tons per square foot.
Marbles	40 to 100
Oolitic limestones	6 to 12
Sandstones	7 to 35

Metals.

	Tons per square inch.
Cast Iron	4 to 10
Wrought Iron	16 to 28
Steel	20 to 70
Copper	10 to 15
Brass	8 to 13
Lead	½ to 1½

N.B.—The tensile strength of metals in the form of wire is, in many cases, considerably more than the figures here given.

recently at Loughton. The architect was Mr. Hailey, of Stony Stratford; the builder, Mr. R. V. Bird, of Loughton.

ST. MARK'S CHURCH, SLEEDMERE, YORKSHIRE.—This church was consecrated a few days since by the Archbishop of York. The church is entirely new, excepting the tower. When about twenty years ago, Sir Tatton Sykes died, he bequeathed to the church the money to erect a new church. The plan of the new church was the same as the old building was discovered. It was then determined to erect the new church on the same ground plan as the mediæval one, retaining the fourteenth century tower. The new church consists of a nave of five bays, with north and south aisles and a space between the aisles for a vestry and a chamber. The vestries are of the fourteenth century, the chamber, with its organ-chamber, over the choir vestry. The style is fourteenth century English Gothic. The nave arcade has moulded columns and arches with moulded caps and bases. The aisles are vaulted in stone, the cells of the groins being filled with clunch, and the ribs and the vault of the red stone used. The roof of the interior. The nave and aisle roofs are carried from west to east on a tub unbroken level, and are constructed of oak, while the ceilings are panelled in oak. The window tracery is designed in the earlier type of flowing decorated. The great east window is filled with five lights. The chancel windows are filled with stained glass, but the side windows are apparently glazed, but it is intended to fill these with stained glass similar to that in the chancel. Features of the church are the stone reredos at the east end of the north aisle, rising nearly to the height of the vault, and the wood-carved reredos immediately behind the high altar, representing the Ascension, with the Virgin and St. John the Baptist on either side. The floors of the church are of Irish marble. The tower has

been restored and a parapet added to the original design. On the parapet are shields bearing the arms of families that have at different times been connected with the estate. The exterior of the church is executed in Whitty stone. The contractors for the work are Messrs. Thompson, Peterborough, who have been assisted by their foremen, Mr. Mills and Mr. Farrer, the carving being executed by Mr. J. Baker. The stained glass is from the studio of Mr. H. V. Milner. The frontals and hangings for the high altar were supplied by Messrs. Watts & Co., those for the side altar by the Horbury Sisters. The metal work is by Messrs. Hardman. The marble flooring is from the works of Mr. R. Colles, Kilkenny; and the organ is by Messrs. Wordsworth, of Leeds. The whole of the work has been executed from the designs of Mr. Temple Moore.

NEW CHANCEL, ST. STEPHEN'S CHURCH, BOURNEMOUTH.—The new chancel of the Bennett memorial Church of St. Stephen, Bournemouth, is of apsidal shape, forming a pentagon, and north and south transepts, a choir, two vestries, and a small circular apsidal Lady Chapel on the north side have also been added, together with a stone organ loft in the south transept. The apse is carried up on eight pillars, which rise to the groining, and are tied at their centres and capitals to the outer wall by shorter arches, the lower ones being surmounted by a quatre-foiled parapet of pierced stone-work. The intervening spaces between the bases of the columns and the outer wall form an ambulatory which is continued right round the back of the altar. Each bay of the apsidal chancel has a three-light clear-story window, the centre, or east window, being of stained glass. The transverse and diagonal ribs of the groin-work which meet in a central ornamented boss or key-stone, are ornamented with dog-tooth moulding, and those of the transepts and chapel are similarly treated. The sedilia, credence, and piscina form one design, and occupy the two south bays of the chancel, each of which is carved at the back, the cornice being treated with diaper-work. The double retable in the chancel is of red marble on an alabaster base, and that in the Lady Chapel is similarly treated. The reredos is a triptych of carved woodwork, the central subject being the Crucifixion, the wings containing figures of saints and angels, being all carved in high relief and coloured and gilded. The figures are those of St. Ambrose, St. Swithin, St. Aldhelm, St. Augustine, St. Stephen, St. John, Moses, Elias, Isaiah, and David. The length of the chancel and choir, from the nave, is 50 ft., and the length of the two transepts is 78 ft. by 16 ft. in width. The height from the floor to the groining of the roof is about 50 ft. The first completed was about 10,000 ft., but the extra work has, it is estimated, reached an additional 2,000 ft. The builders are Messrs. Abley & Co., of Salisbury. The architect was the late Mr. J. L. Pearson, R.A., and since his death his son, Mr. F. L. Pearson. The foreman of the work has been Mr. F. E. Chalk, and the clerk of the works was Mr. W. Harlow. The chancel and transepts are lighted by electricity, and it is intended to use the electric light in the nave at a later date. The alabaster and marble retables are the work of Mr. Davison, of London; the reredos is by Messrs. Moos Bros., of London; the sculptured figures and carving being by Mr. Hitch, of London, and the decorating of the same by Messrs. Clayton & Bell, of London.

CHURCH, BISHOPSTHORPE, YORKSHIRE.—A new church is to be built at Bishopsthorpe, near York. Mr. Hodgson Fowler, of Durham, has prepared plans of a building which, when completed, will consist of nave, south and north aisles, chancel, south chapel, organ chamber, sacristy, and vestry. At the west end will be a tower, rising to a height of 64 ft. The cost of the building will be 6,600 l., and accommodation will be provided for 320 worshippers. At present, however, it is not intended to proceed with the whole work. A contract has been let for building the chancel, nave, aisles, and sacristy, which will cost 4,550 l. The builders are Messrs. Bowman & Sons, Stamford, and Mr. T. A. Bolton, of York, is clerk of the works.

ST. COLUMBA'S CHURCH, BRIDGETON, GLASGOW.—The corner and memorial stones were laid recently of the new St. Columba's Episcopal Church and halls, which are in course of erection in Bridgeton. The church is being erected to commemorate the thirteen hundredth anniversary of St. Columba. The buildings are designed in the late Gothic style. The church consists of nave with chancel and south aisle, the roof being an open timber one. The usual chancel arch has been discarded, and the nave roof is carried the full height over the chancel. A carved oak roof beam separates the chancel from the nave. The east window has beneath it, and over the altar, a St. Columba cross of gold mosaic. A morning chapel adjoins the chancel, and a mortuary chapel is placed at the south-west corner of the site. Behind the church are placed the halls, which consist of a hall on the upper floor, accommodating between 300 and 400 persons; beneath this, on the ground floor, is a smaller hall, also vestry and class-rooms, with lavatory accommodation. The buildings will be faced with terra-cotta bricks and red stone dressings. The interior of the church, as also of the morning and mortuary chapels, also will be faced with terra-cotta bricks. The contractors for the work are

Messrs. Morgan & Sons, Glasgow, and the architect is Mr. James Miller, Glasgow.

PROPOSED RESTORATION OF PARISH CHURCH, ODHAM, SUSSEX.—It has been decided to carry out the restoration of the parish church of Odham. The estimated expense of the proposed alterations as prepared by the architect (Mr. J. B. Colson, of Winchester), is estimated at 1,300 l., and it is proposed to proceed with the work in sections.

CHURCH, COWDENBEATH, FIFE SHIRE.—A new Established Church has just been opened in Broadstreet, Cowdenbeath, from plans prepared by Mr. John Whitelaw, Edinburgh. The church is cruciform on plan, and will accommodate 500 people, the total cost being about 1,800 l.

CHURCH OF ST. GABRIEL, HEATON, NORTHUMBRIA.—The foundation-stone has just been laid in Heaton-road of the new Church of St. Gabriel. The architect is Mr. F. W. Rich, and the church is estimated to cost 10,000 l., and give 1,000 sittings. For the present, however, only the nave, giving space for 500 worshippers, is to be proceeded with, and this will cost about 4,175 l., inclusive of furnishing.

TWEEDMOUTH MEMORIAL CHAPEL, INVERNESS.—The chapel which has been gifted to the Northern Infirmary at Inverness by the Dowager Lady Tweedmouth as a memorial of her late husband was opened for public worship on the 11th inst. The chapel adjoins the infirmary, to which it is structurally attached by a corridor. The nave, which is 44 ft. in length by 18 ft. in width, is intended for all forms of Christian worship. On the north side of the nave an altar for the use of the priests of the Roman communion is placed in a transept, which is separated from the nave by a wrought-iron gate and crimson hangings, and the altar of the Anglican communion is similarly placed on the opposite side of the nave. The architects are Messrs. Ross & Macbeth, Inverness. The total cost is over 3,000 l.

THE RESTORATION OF AUSTINFIELD CHURCH.—St. Helena's Church has been reopened by the Bishop of Southwell, after its restoration by Mr. Hodgson Fowler. In the course of the works was disclosed a Norman arcade, in the north wall, which has been carefully reinstated. The new north aisle was built with subscriptions sent by the Society of Mayflower Descendants and other citizens of the United States, in memory of Governor William Bradford, who was born in the parish, and baptised in the church on March 19, 1580. A brass is to be placed in the church to that effect, and the inscription will record that Bradford "was the first American citizen of the English race who bore rule by the free choice of his brethren." The church was built in the earlier half of the twelfth century.

PRESBYTERIAN CHURCH, MALONE, BELFAST.—The foundation-stones of the new Malone Presbyterian Church were laid recently. The new church will occupy practically the position of the old edifice, which has been entirely removed. The site has a frontage both to the Lisburn-road and Balmoral-avenue. With the necessity for upwards of 1,000 sittings the plan was adopted of a nave and aisles with large projecting transepts. Prominence is given to the main doorway, which has octagon shafts, with moulded bases and caps, carrying a Tudor arch moulded and carved. A tower is placed at the south-west angle of the church. It is crowned by a stone spire, which terminates in a gilt copper weather vane at a height of 125 ft. At the opposite angle is an octagonal projecting stair, and the whole is angle buttresses and a doorway between them. The roofs will be covered with green Westmoreland slates. The walling is of selected Scrabo sandstone, with mullions of Giffnock stone. The contractors for the work are Messrs. Courtney & Co., and the architects are Messrs. Young & Mackenzie, Belfast.

WESLEYAN METHODIST CHURCH, ECCLESFIELD, YORKSHIRE.—This building, which has been built from plans prepared by Mr. H. W. Lockwood, is in the Renaissance style. It is built of rock-faced stone, with ashlar facings. The plan of the building consists of nave and transepts, with an organ and choir chamber, below which are vestries, and adjoining these are lavatories. A gallery runs round three sides, to which access is given by four staircases. The contractors are Messrs. Maston & Sons, masons; Messrs. Vasey & Sons, joinery; Messrs. Charles Chadwick & Sons, slating and plastering; Messrs. J. B. Corrie & Sons, plumbing; Mr. Frank Tory, carving; and Mr. Twelves, painting. The heating apparatus has been supplied by Newton, Chambers, & Co., Limited, Thorncliffe; whilst the Sheffield United Gas Light Company, Limited, supplied the lighting fixtures. The building will accommodate about 750 worshippers.

WESLEYAN CHAPEL, COVENTRY.—A new Wesleyan chapel is being erected in the Stoney Stanton-road, Coventry. The building will cost 3,400 l., and provide accommodation for 750 persons. Messrs. Habell & Harrison are the architects, and Mr. C. Garlick is the builder.

CONGREGATIONAL CHURCH, TOPCROFT, NORFOLK.—The foundation-stone has just been laid of the new Congregational Church at Topcroft. The building consists of church, porch, and vestry, erected in red brick. The size of the church is 38 ft. by 23 ft. 6 in. It is lighted by a mullioned window at the end, with four windows on the south side, and two on the north. The benches are arranged for 150. The rostrum is at the east end, and behind it

is the door of the vestry. The lowest estimate, 545 l., was that of Messrs. S. Y. Brock & Sons, of Alburgh, to whom the work was entrusted. Messrs. Edward Boardman & Son are the architects.

FREE CHURCH IMPROVEMENTS, GIRVAN, Ayrshire.—Girvan Free Church has been remodelled, and a new system of ventilation introduced, under the superintendence of Mr. Petrie, architect, Glasgow. The contractors were Messrs. Robertson & Sons, Kilmarnock.

WELFIELD U.P. CHURCH, GLASGOW.—Wellfield U.P. Church, Springburn, the foundation-stone of which has just been laid, is at the corner of Balgray Hill and Murdoch-street, and extends back to Sutherland-street. There is a fall of the ground on the hill side, there being a difference of over 27 ft. between the levels of the back street and the lower point on Balgray Hill. To meet this, the hall has been placed facing Sutherland-street, on the higher level, and entering from Murdoch-street, the rooms, vestry, session-house, &c., on an intermediate level, while the church occupies the corner of Murdoch-street and Balgray Hill, with entrance from both streets. The main entrance faces Balgray Hill. Internally, the church is planned with nave and side aisles, which are separated by moulded stone arches carried on played stone piers. There are galleries at the sides and end, but the galleries are kept back behind the line of the stone piers, allowing these to be carried up in an unbroken line. Above the piers attached stone shafts are carried up, terminating in carved caps, from which spring the principal roof couples. The piers will be placed under a wide stone arch at the eastern end, and on each side, under smaller arches, an organ chamber is arranged. The hall is 54 ft. long and 28 ft. broad, and there are two large class-rooms, which can be opened into one, forming a lesser hall for 100 persons. The style is Gothic of the late Decorated period, and the principal feature externally will be the tower and spire, which will be over 100 ft. high. The lower stage is carried up square to the belfry chamber, where the plan becomes octagonal, with projected buttresses at the angles of the tower. The principal front to Balgray Hill has the main gable in the centre, flanked by the tower on one side and a projecting staircase on the other. The mason work is in red sandstone. The number of sittings provided is 808, and the expected cost of the whole scheme is about 7,200 l. The architect is Mr. John B. Wilson, Glasgow, and the following are the principal contractors:—Mason, H. Nelson & Co.; Wright, Thomas Brown; Slater, Thomas Muir; Plasterers, J. & A. Williamson; Plumber and Gasfitter, Thomas Munro; Glazier, Joseph Miller; and Painter, A. Stirling, all of Glasgow.

PROPOSED NEW BAPTIST CHAPEL, DEANSHANGER, NORTHAMPTONSHIRE.—The tender of Mr. A. F. Hawtin, of Northampton, at 524 l., has been accepted for a new chapel at Deanshanger in connexion with the Baptist Chapel at Stony Stratford. The designs were prepared by Mr. Coker, of Wolverton.

WESLEYAN METHODIST CHAPEL, HALIFAX.—The Wesleyan Methodists of the Halifax (Rhodes-street) Circuit, are erecting a new chapel on a site on the north side of Pellon-lane, just below the end of Queen's-road, from plans prepared by Messrs. Utley, Hebblethwaite & Utley.

SCHOOLS, WELSHPOOL.—The new Intermediate Schools at Welshpool were opened on the 9th inst. They are situated in Severn-street, near the Cambrian Railway Station. The materials used were red brick, obtained from the Buntingford Works, with dressings of stone, and Ruabon tiles. The building is designed to accommodate seventy-five boys and the same number of girls. It is fitted with a kitchen and laundry on the ground floor, and a chemical laboratory and science lecture room is provided on the upper floor. The headmaster's and headmistress's rooms are centrally placed. The building has been erected by Messrs. Brindley & Lloyd, of Shifnal, from the designs and under the supervision of Mr. Frank H. Shaylor, with Mr. Potter, of Welshpool, as clerk of the works.

GRAMMAR SCHOOL, BRIDLINGTON.—The foundation stone has just been laid of Bridlington Grammar School. The structure will be of red brick with stone dressings and red tiled roofs. The hall occupies the centre. This is 51 ft. 6 in. long by 30 ft. wide, rising through the height of the two stories. It has an open timbered roof and is surmounted by a turret. On the west and south sides of the hall are four class-rooms, which will afford accommodation for a hundred boys. On the north side space is left for additional rooms, which will be provided when funds permit. The principal entrance to the school will be beyond the class-rooms on the east front, and the playground entrance will be on the west front. The head master's house, on the south side, will have frontages to the east and south. Accommodation is provided for thirty boarders, with dining-hall on the ground floor and dormitories on the first floor. The buildings have been designed by Messrs. Botterill, Son, & Bilson, architects, of Hull, and the erection will be carried out by Messrs. John Thompson and Co., of Peterboro', at a cost of over 8,500 l. Mr. W. H. Williams is the clerk of works.

SCHOOL, ASTON, BIRMINGHAM.—At a meeting of the Aston School Board recently, the tender of Mr. John Bowen, of Balsall Heath, amounting to 19,480 l., was subject to the approval of the Education Department, accepted for the erection of the new higher-grade school, pupil teachers' centre, deaf

school, and caretaker's house, on the site in the Whitehead-road. The architects are Messrs. Crouch & Butler.

NEW SCHOOL BOARD OFFICES, ABERDEEN.—The new buildings for the Aberdeen School Board in Union-terrace are now almost completed. The architect of the building is Mr. A. Marshall Mackenzie, A.R.S.A., and the furnishings were designed by Mr. Allan, the Board's master of works. The contractors were—Mason work, George Fordyce & Co.; carpenter work, D. Macandrew & Co.; slater work, Alexander Adam & Co.; plaster work, James Bannochie & Sons; plumber work, A. B. Robertson; painter work, G. Donald & Sons; and electric lighting, P. C. Middleton & Co.

SCHOOLS, BLACKBURN.—The memorial stone has just been laid in the St. Matthew's parish, Blackburn, of new boys' school and parochial hall. The new building provides for 200 extra day scholars, and, by using the parochial hall, 500 Sunday scholars. The parochial hall (built above the school) will answer the following purposes:—Drill hall for day scholars, drill hall for Church Lads' Brigade, gymnasium for men and youths, lecture room, Sunday school, mission services for poor on Sunday nights, club room, &c. Mr. James Bertwistle is the architect of the building.

ATHENIUM CLUB, READING.—This building has been erected in Friar-street, Reading. It occupies a site at the corner of Friar-street and Merchants'-place. It has been erected of red terra-cotta and brick and a small quantity of granite. The ground floor, with the exception of tiled entrance-hall and hall-porter's quarters, is let off for business premises. A stone staircase leads from the ground floor to the club-rooms on the first floor. These comprise two rooms facing Friar-street, to be occupied as reading and smoking rooms respectively, a card-room to Merchants'-place and a dining-room 27 ft. by 18 ft. Adjoining the dining-room is a steward's servery 28 ft. long, communicating by lift with the kitchen. Above the kitchen leads from the ground floor to the pitch-pine staircase, and gives accommodation in front for a billiard-room, 50 ft. by 25 ft. On this floor there is also a committee-room and bath-room, and separated by a service door are the necessary domestic offices, with bedrooms for staff over. Messrs. Millar & Nasmith, Reading and Oxford, were the architects, and Messrs. J. Bottrell & Son, the builders.

YSTRAD MENRIG CHURCH, CARDIGANSHIRE.—On the 14th inst. the foundation stone of a new church at Ystrad Menrig, Cardiganshire, was laid. Local stone is employed in the walling, the tracery and dressing being of red Hollington stone. The architect is Mr. Harold Hughes, of Bangor; and the contractors are Messrs. Charles Davies & Co., of Llanfarian, near Aberystwyth.

PROPOSED WORKHOUSE EXTENSION, SOLIHULL.—On the 14th inst., at the Solihull Board of Guardians, the Special Committee appointed to consider the question of workhouse accommodation recommended the erection of an infirmary (to accommodate thirty-two males and thirty-two females), including lying-in ward, two rooms for the special use of the workhouse medical officer, nurses' rooms, &c., isolation ward (four beds), tramp wards for forty males and twenty-four females (including six separate cells for males and six for females), together with the necessary offices in connexion therewith. The new buildings recommended are in accordance with plans prepared by Mr. W. H. Ward, architect, who estimates the cost at 10,000l. to 12,000l. It was decided to alter the resolution to the effect that the further discussion of the report be deferred for a month.

SCHOOL, BLACKBURN.—The foundation-stone has just been laid of the new infants' school for St. Barnabas's parish, Blackburn. The building, the architect of which is Mr. F. J. Parkinson, consists of schoolroom 54 ft. 6 in. by 22 ft., two class-rooms each 27 ft. by 19 ft. The building is one story in height, and will accommodate 240 children. It is to be built of brick, with stone dressings, the roofs to be covered with blue slates and red tile ridge.

PROPOSED ARTISANS' DWELLINGS, BRIGHTON.—Colonel A. J. Hepper, conducted a Local Government inquiry at Brighton on the 14th inst., into the subject matter of an application on the part of the Corporation for sanction to borrow 1,250l. for the erection of workmen's dwellings in the borough. Mr. May (Borough Surveyor) explained the plans. Mr. Talbot (Deputy Town Clerk) said the freehold land had been conveyed to the Corporation, who had had schemes prepared for the erection of the dwellings, competitive designs for which were invited by competition, with the result that the sum of 75l. was paid to Messrs. Garrett & Gilham, architects, of Brighton, for their design, "Sanitas," and 25l. was divided among four other competitors, but neither of the designs was accepted in entirety, and the surveyor had based his design upon them. It was proposed to erect thirty houses on the Lewes-road site, where there were sites for a total of sixty-nine houses, and twenty-eight houses on the Elm-grove site, where there was ground for 168 houses in all. With regard to the Lewes-road site, it was proposed to erect houses of 15 ft. frontages, and each of six rooms.

THEATRE ROYAL, BARNSELEY.—The corner stone of the new Theatre Royal, now in course of erection in Wellington-street, was laid recently. The new theatre is being erected on the site of the old build-

ing and a row of cottages which ran by the side of it. Mr. Walter Enden, of London, prepared the plans, which are being carried out under the superintendence of Mr. H. Crawshaw, Barnsley. The tenders amount to about 10,000l., and there are other works to be executed, which will bring the total cost to about 16,000l. The building will have seating accommodation for 1,400, and can be made to accommodate about 2,000 in case of a crush.

WOOL STORE, EDINBURGH.—A new wool store is being erected in Dryden-street, off Pilrig, by Messrs. Russell & Ramsden. The building, which is being erected from plans and under the supervision of Mr. Frank W. Simon, architect, measures 243 ft. by 170 ft., covering about an acre of ground, and is three stories in height, with a half-sunk flat at the back.

BATHS, QUEENSTOWN.—New salt-water baths have just been erected at Queenstown by Mr. D. Forde, from the designs of Mr. D. J. Coakley, C.E. There are four entrances to the building, the main entrance being at the west end. The men's bath, which is at the westward end of the main building, is 70 ft. long by 40 ft. wide. It is surrounded by a balcony on all sides, and in addition to which, on the north side, are dressing-rooms. The bath, which has a graduated floor, is over 9 ft. deep at its western end. Steps are erected at each angle for the use of the bathers. The women's bath, at the eastern end of the building, is 50 ft. long and 40 ft. wide. The baths will be re-filled at every tide.

BUSINESS PREMISES, NORWICH.—An addition has just been made to the premises of Messrs. Johnson, Burton, & Theobald, Castle-street, Norwich. The facade of the new building, which was designed by Mr. J. B. Pearce, and built by Messrs. Scates, Bros., is in the Renaissance style, and of St. Bee's redstone and brick. It consists of three stories and a basement. While digging the foundations for the building, the workmen came across a part of the masonry of the old castle ditch.

PRELIMINARY TELLING INDUSTRIAL SOCIETY, DURHAM.—The members of this society have erected new branch stores in Coldwell-street. The premises comprise drapery, grocery, provision, and butcher shops, with lecture hall above. The work of construction has been supervised by Mr. James W. Frazer, of Newcastle, from whose plans the buildings have been erected. The builder was Mr. Robert Davidson, of Felling.

NEW BREWERY, SUNDERLAND.—There is now in course of erection a large brewery extension at the Monkwearmouth Brewery. The new building is situated near Sunderland Bridge. It is five stories in height, composed of two large cellar floors, one barley floor, two maling floors, and kiln floor. The building, which is 170 ft. long by an average of 60 ft. wide, covers an area of 912 sq. yds., and is built of brick, plain but substantial. The premises have been planned by, and are now being carried out under the supervision of, Messrs. Wm. & T. R. Milburn, architects, Sunderland, the contractor being Mr. T. P. Shattock, also of Sunderland.

UNIVERSITY COLLEGE HOSPITAL.—The Prince of Wales laid the foundation-stone of University College Hospital on the 21st inst. Sir J. Blundell Maple has undertaken to rebuild the hospital at a cost of 100,000l. The building is bounded by Grosvenor-street, Grosvenor-street, Huntley-street, and University-street. The material is red brick, with terra-cotta dressings, and the plan is that of a diagonal cross. The architect is Mr. Waterhouse, R.A., and the building has been designed to give accommodation to 300 patients. An illustration of the building, and a brief description, appeared in our issue of October 17, 1896.

CRIPPLES' HOME, BOURNEMOUTH.—This building, which is situated in the Beaulieu-road, Alum Chine, and will accommodate about twenty-five crippled children, has just been opened. The architect is Mr. F. Warman.

RESIDENTIAL FLATS, WESTBOURNE-GROVE.—The house forming Nos. 118 and 120, Westbourne-grove, for many years occupied by the late Prince Lucien Bonaparte, is now being converted into residential flats from the designs of Mr. W. I. Chambers. The house was originally two, but converted into one by the late Prince, and contained some magnificent carved marble chimney-pieces imported by him. The interior has, however, been so cut up and divided by the process of conversion that those who knew the place when occupied by the Prince would not recognise it now. It is a proof of the demand for flats at the present day, that while in its previous state the rental value to be obtained was very inadequate to the cost, now, by the outlay of about 1,500l., the flats could pay a good interest on capital and a handsome return for outlay.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, DURHAM DISTRICT.—The scheme of water-supply submitted by the Easington Rural District Council for Wingate Mill, Wingate-lane and High Wheatley Hill, has been officially approved by the Local Government Board. It is proposed to obtain the water from the Kelloe Winning Pumping Station of Messrs. W. Scott & Co., Limited, where it is obtained from the sand-feeder underlying the limestone. It will be pumped into a tank by a forcing set of pumps attached to the main pumping-engine. The analysis certifies the water to be of

excellent quality. After reaching the first tank, the water will again be pumped into an elevated storage tank to be erected on the highest point in the district at Wingate Mill, with capacity equal to several days supply, whence it will be distributed in cast-iron mains over the district. The engineers are Messrs. D. Balfour & Son, of London and Newcastle.

BRIDGE, SOUTHWOLD.—The foundation-stone has just been laid of a new bridge near the railway station at the west end of the town. The new bridge, the plans of which were prepared by Mr. Henry Miller, County Surveyor, will have brick abutments and retaining walls, and the superstructure will be formed of steel trough girders from Messrs. Dorman, Long, & Co., of Middlesbrough. The parapets over the span will be of wrought-iron lattice work. Brick piers will be erected at each end of the bridge. Mr. F. Ball is clerk of works.

DRAINAGE, PORTSMOUTH, SOMERSETSHIRE.—A Local Government Board inquiry was held on the 14th inst. in the Assembly Hall, Portsmouth, by Mr. W. O. E. Meade-King, M.P. for East Hampshire, in connection with the application of the Portsmouth Urban District Council for 3,000l. for the purposes of sewerage. Mr. T. J. Moss Flower (Surveyor to the Urban District Council) said he prepared the drainage scheme that had been sanctioned by the Local Government Board. The contract with Messrs. J. & T. Binns was entered into on June 14, 1897. The period that the work was allowed to stand still, owing to the abandonment of the first contractor, was about eight months before the second contractor commenced work. There had been considerable difficulty with the first contractor, who sent in a claim in September last for 5,547l. 5s. 7d. and 25l. per week for the extension of time claimed, and Mr. Mann, who was the arbitrator, allowed him 1,194l. 18s. He was, however, ordered to put certain materials on the site of the works. The scheme as now to be carried out was on the same lines as the one sanctioned by the Local Government Board, except that they had to pay an extra amount for rock excavating. The principal causes for extra expenses were rock cutting, running sands, water-logged soils, the necessity of leaving a quantity of timber, in consequence of running sands to be met with in the course of the work, and where there had not been running sands, there had been a soft, spongy clay, where it was necessary to put in layers of concrete. The main cause of the increased cost had been due to the change of contract. There were two other contracts, one of which was with Messrs. Roberts & Co. for cast-iron pipes to the amount of 791l., and the other was with Messrs. J. & S. Parsons for ventilating columns at 140l. 11s. 6d. These contracts had been carried out. Messrs. J. & T. Binns's contract was 11,014l. 13s. 9d., and there was a difference of about 15 per cent. from the original contract. There were no questions asked, and the inquiry was closed.

MANCHESTER SEWAGE DISPOSAL QUESTION.—Mr. Baldwin Latham, Dr. Percy F. Frankland, and Professor Perkin have together issued formal notice that they have undertaken the duties entrusted to them by the Manchester Corporation, whereby the scheme for sewage disposal, approved by the City Council on May 20, was referred to them for their conjoint opinion, and they were requested and authorised to advise as to any alternative scheme which may be put before them or which they may recommend. They further give notice that they are prepared to receive written communications setting forth any scheme which may be suggested for their consideration. At the same time they wish it to be understood that no premium is offered, and that no expenses will be paid in respect of any scheme which may be so submitted.

SPIRIT LEVEL FOR CHANNEL INTERCEPTOR.—Messrs. J. H. Sankey & Son (London) send us a patent channel interceptor with a spirit level fixed on the upper side of the bend of the pipe, so that it can be seen at a glance whether the interceptor has been seated at the proper fall.

ELECTRIC LIGHTING NEWS.

ELECTRIC LIGHTING IN BELFAST.—A new electric lighting station is being erected for the Belfast Corporation, in East Bridge-street. It will contain an engine-room to accommodate engines and dynamos to the extent of about 5,000 h.p., and a boiler-house. At the west end are the public offices, battery, and test rooms and store rooms, while the general offices for the staff are situated upstairs. The whole scheme was designed by Mr. Victor A. H. McCowen, electrical engineer to the Corporation, and the work has been carried out by Messrs. J. & W. Stewart.

ELECTRICITY WORKS, WAKEFIELD.—The Wakefield Corporation Electricity Works at Calder Vale, which were opened a few days ago, have been laid down under the powers accorded to the Corporation by their electric lighting provisional order granted in the year 1894. Mr. Robert Hammond, was appointed consulting electrical engineer, and prepared plans and specifications of the works. The buildings comprise boiler house, engine house, testing room, workshop, stores, and offices.

ELECTRIC LIGHT, COVENTRY.—On the 14th inst. Mr. C. W. Willcocks held an inquiry at St. Mary's

Hall, Coventry, into the proposal of the Corporation to borrow 35,000l. for the purposes of electric light extension. Mr. R. Hammond, the consulting engineer, gave details of the scheme and expenditure, and afterwards the inspector visited the works and sites of the proposed sub-stations. There was no opposition to the Corporation application.

STAINED GLASS AND DECORATION.

SOUTH WINGFIELD CHURCH, DERRY.—A stained glass window has just been placed in this church by Messrs. Peter and William Summerton, of Leeds, in memory of their parents. The subject illustrated is Christ as the Great Consoler, and the work has been designed and executed by Messrs. Powell Bros., of Leeds.

DESIGN FOR WALL DECORATION.—Messrs. Rottmann & Co. are holding an exhibition of modern wall decoration at their show rooms at Garlick-hill. Three years ago their exhibition consisted chiefly of Mr. Silver's designs; since his death Mr. Rottmann has continued the work alone, with the result of the present exhibition. Stencil decoration forms the most attractive part of the exhibits. Experiments have been made with many new materials, the difficulty being to obtain the transparency of successful colour decoration. The best results are obtained on Sargia cloth and coarse brown paper. Japanese jutes and tapestry are also used, and silk for the more delicate work. There is more architectural principle in the designs than hitherto, and each design is capable of variation in carrying out repetition to suit room or staircase. This reduces the mechanical feeling often objectionable in a flowing frieze or wall-paper. The figure is a difficult subject for stencil, and at present has not been treated very successfully. A feature of the exhibition is the Orlando design, a complete scheme of decoration for a room, from floor to ceiling.

FOREIGN.

FRANCE.—A sum of 97,000 francs has been set aside for the enlargement of the Columbarium of the Cemetery of Pere La Chaise, from the plans by M. Formige, architect of Promenades. The Municipality of Paris has just bought the beautiful statue by M. Vital Cornu, "Doux Langueurs," which is in this year's Salon. It is to be placed in the Musée Artistique. The inauguration of the monument erected to the memory of Sainte-Beuve took place last Sunday. As we have already announced, this monument is the work of M. Denys Puech; the pedestal has been entrusted to M. Mouré, architect. On the occasion of this ceremony M. Puech was made an officer of the Legion of Honour. M. Aime Morot, the painter, has been elected a member of the Academy des Beaux-Arts in place of the late Gustave Moreau. A fine group of school buildings was inaugurated in the Rue Joffroy (17th arrondissement) last week. This establishment, which is well arranged, is the work of M. Paulin, architect. The group of artists living in the neighbourhood of St. Maur have just opened their fourteenth exhibition of painting and sculpture. It is a very interesting and is chiefly made up of landscapes. Amongst the works sent are some by MM. Quinton, Paul Lecomte, Jourdeuil, Deblois, and Vallet. The Municipal Council of Paris are now considering a project, prepared by M. Humblot, Inspector-General of "Ponts et Chaussées," to increase the water supply of Paris. The works that he proposes will bring in a larger quantity of water into Paris and also provide new reservoirs at Châtillon and St. Cloud. The expense is estimated at 167,000,000 of francs. M. Berlier, a well-known engineer, has been studying a project for connecting Africa and Europe by means of a tunnel placed between Tangiers and "Ance de Vaqueros," in Spain. It is thought that it will take seven years to carry out this great scheme. A sum of 5,431,000 francs has just been given for the draining and beautifying of the town of Vichy.

CAPTOWN.—The Capetown Harbour Board has adopted the plan for the extension of the harbour works submitted by the resident engineer (Mr. H. Thwaites). The scheme provides for the conversion of the quarry into a basin 1½ acres in extent, with 2,900 ft. quayage, and an entrance 120 ft. in width, from the Albert Basin close to the present entrance to the graving dock. A swing bridge is to be thrown across the entrance. It will be capable of taking passengers and railway and other traffic. On the western side provision will be made for a new graving dock, which will be included in the present scheme in order to save the additional expense of making it after the water has been admitted into the quarry. The whole work will occupy three years, and will cost 270,000l.

SWEDEN.—The last date for sending in designs for the competition for the railway station at Stockholm, has been postponed from August 31, to December 31, 1898.

GERMANY.—The second general meeting of the Electric Railway Company of Berlin, was held on the 17th ult. The report for April-December, 1897, was presented. A length of 2 kilometres has now been laid, and the remaining 1½ kilometres of the eastern portion of the railway will be laid in the current year. The Berlin Society of Architects has offered a prize (the competition is restricted to

its own members) for the best design for a corona of one central and twenty-four surrounding lamps to light the domed room of its buildings. The price is restricted to 950 marks. The sculptors of Germany are invited to compete for a monument to the Emperor William I., to be erected at Hildesheim. It is to consist of a bronze figure, on horseback, standing on a pedestal formed of variously coloured granites, with a panel for an inscription. The cost is limited to 30,000 marks; in addition to the commission there are three prizes of 1,000 marks each. A competition, limited to natives of Frankfurt by birth or settlement, is offered for the design of a monument of the German struggle for unity 1815 to 1864. The report of the technical schools of Munich has been published. A total attendance of 1,865 students in the first half of the present year—as against 1,915 in the second half of last year—is estimated. Of the students, four are British, four American, and one Australian. An exhibition will be held in Brunswick next August of ancient and modern works of ecclesiastical art.

MISCELLANEOUS.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held in Leeds on June 10 and 11, 1898, one candidate presented himself. At an examination for Sanitary Inspectors, held in Leeds on June 10 and 11, 1898, thirty-six candidates presented themselves, and the following twenty were certified, as regards their sanitary knowledge, competent to discharge the duties of Inspectors of Nuisances:—E. Ainley, Huddersfield; J. R. Bell, Bedale; T. Biker, Barnoldswick; G. H. Canby, Keighley; J. Carratt, Leeds; J. Coupe, Bramley, Leeds; J. S. Cromack, Leeds; A. G. Dalzell, Halifax; J. Finn, Penrith; F. W. Girven, Easington-lane, R.S.O.; J. Jackson, Penrith; W. T. Jells, Frankley, Birmingham; H. King, Millom, Carnforth; J. W. King, Blackburn; A. H. Mervyn, Castleford; Miss L. M. O'Kell, Bedford; R. C. Schofield, Keighley; G. Scott, jun., Daisy-hill, Chester-le-Street; G. Siddall, Oset, and A. Wharfe, Keighley.

GREENWOOD'S TIMBER CALCULATOR.—The publisher's name of this book, mentioned under "Books" in our last issue, should have been printed "Buxendale, Manchester," not "Buxendale." It is also published by the author.

BOOK SALES.—A valuable collection of topographical works, relating mostly to Yorkshire, was dispersed in the sale last week, at Sotheby's, of the library of the late Mr. John Stansfeld, of Leeds. The various lots comprised Mahning & Bray's "History and Antiquities of Surrey," 1804-14, on large paper—19l. (Bampus); Dugdale's "Monasticon Anglicanum," edited by Ellis, Caley, and Bandinel, with "Ellis's History of St. Paul's," ten volumes, on large paper—40l. (Sotheman); "Visitations" and "Registers," published by the Harleian Society, 1840-73—28l. (Quaritch); *Notes and Queries*, 1849-82, seventy volumes—19l. (Walford); and the *Gentleman's Magazine*, with indexes, 1731-1868, 228 volumes—24l. 10s. (Sotheman).

THE BEAUFORT ESTATES, MONMOUTHSHIRE.—The landed property and estates, upwards of 26,000 acres, in Monmouthshire, together with woods and land in Woolstone and Tidenham, co. Gloucester, belonging to the Marquis of Worcester, on conveyance to him by his father, the Duke of Beaufort, are offered for sale by private treaty. The total rent-roll is estimated at 29,410l. per annum; the properties comprise twenty manors and various others and other trade premises in Chepstow, Usk, Monmouth, Newport, Treleick, Caerleon, and round about, together with Usk Castle, the birthplace of Richard III. and Edward IV.; Raglan Castle; Chepstow Castle, built in the eleventh century; Monmouth Castle, wherein Henry V. was born; the Castles of Gwent, Skenirith, and Strigill; Troy House; and the Cistercian Abbey at Tintern. In the ruins at Raglan stands the tower in which the second Marquis of Worcester (ob. 1607) conducted his memorable experiments, one of which clearly foreshadowed the steam-engine. Chepstow, ascribed to the Conqueror's comrade-in-arms, William FitzOsbern, has four wards in the first and third of which are the keep and the chapel respectively, the hall, kitchen, and state apartments (temp. Edward II.) being ranged round the first court, entered between two round towers of temp. Edward I.; in this court, too, is the Early English Marten's tower, for twenty years the prison of Henry Marten, the regicide, with a beautiful thirteenth-century oratory in its upper floor.

NATIONAL REGISTRATION OF PLUMBERS.—The Provost Glover presided at the annual public meeting of the District Council for Dumfries, Kirkcubright, and Wigtown, in connexion with the National Registration of Plumbers, at the Town Hall, Dumfries, on Saturday last. In moving the adoption of the report he said that the public themselves were perfectly satisfied as to the dangers of bad plumbing and had been so thoroughly aroused that they had sought to arouse the plumbers, and it was to be hoped, after the attention the matter had received, on public and sanitary grounds, that the plumbers themselves would respond to the appeal that had been made to them to make sure that they entered into a proper appreciation of their duties as tradesmen, and that nothing but thoroughly good work was carried out. The Town Clerk, Mr. John

Grierson, moved a resolution that the Council petition Parliament in favour of the Plumbers' Registration Bill. The resolution was seconded by Bailie Hanlon, and carried. It was announced that the next Congress of District Councils in Scotland would be held in Glasgow on August 18, 19, and 20 next, and in connexion with it what is expected to be by far the largest and finest exhibition of plumbers' work that has yet been held.

BUILDERS' EXCHANGE, HUDDERSFIELD.—A meeting of master builders and others of Huddersfield was held a few days ago at the Cherry Tree Hotel, Huddersfield, to consider a proposition that an Exchange be established for the use of members of the building and allied trades, and merchants and dealers in building materials. The Mayor of Huddersfield (Alderman Jessop) had been announced to preside, but was unable to attend, owing to indisposition. His Worship wrote that he cordially approved of the formation of the proposed Exchange, and observed that in view of the continued increase in Imperial legislation relating to the industries of the country, it was imperative that those engaged in trade should make themselves acquainted with the legislation affecting the particular trade with which they were connected. He felt it was not right that the young men who were being educated with the object of entering into the businesses established by their fathers should be asked to meet in public-houses to transact business, as was done fifty years ago. He felt sure that discussion would show that the meeting would be in favour of the establishment of an association. The Chairman (Mr. Lewis) said that associations similar to the one they desired to found were in existence in Bradford, Halifax, and Leeds, each with a large membership and working successfully. He moved:—"That it is desirable to form an Exchange for the building and allied trades in Huddersfield and district, for the purpose of offering additional facilities to the members of the trades for the transaction of business between themselves and for social purposes." Mr. John Pyrah seconded the motion, which was adopted. The Mayor was elected president, Messrs. Wilmshurst and Stones hon. secretaries, and Mr. T. B. Tunncliffe hon. treasurer. A committee was also appointed.

A NON-MANTLE INCANDESCENT BURNER.—We have received from Billing's Burner Syndicate, of 180, Wardour-street, London, a specimen of their "non-mantle incandescent burner." This burner does not belong to the class of burners popularly known as "incandescent" which are used for heating some non-combustible material to a state of brilliant incandescence, but is of the regenerative type. It may, in fact, be described as consisting simply of an Argand gas-burner provided with an additional glass chimney, and a small expansion and heating chamber, so arranged that both gas and air are heated before arriving at the point of ignition. The result of this arrangement is to increase the illuminating power of the flame, and to give it a much whiter appearance than is possessed by the flame of the common forms of the Argand burner. The burner is fitted with a small side-screw, by means of which the gas inlet may be so adjusted that the flame cannot fall above the chimney and "smoke."

GREYFRIARS CHURCH, ABERDEEN.—On the 14th inst., the Aberdeen University Court, sitting in committee, considered the reply of the Town Council regarding the retention of Greyfriars Church, and the following was officially communicated as the result of the meeting. The committee having considered the report of the Sites and Plans Committee, with accompanying plans and estimates, showing the erection of a wing to the south of the existing College buildings and facing Broad-street, which would accommodate the Administrative and Law Departments, with either the Library or the Wilson and Grant Bay Museums, and the extension eastward along Longacre of the accommodation for the Departments of Natural History and Physiology, resolve to report to the Court that, in the opinion of the committee, the proposed extensions would suitably provide for the remaining requirements of the University, and would form, with the retained Greyfriars Church, if properly restored, an effective scheme architecturally which can be carried out at a reasonable cost. The committee accordingly recommend the University Court to agree provisionally to the proposal of the Town Council that Greyfriars Church be retained and restored for the use of the congregation, provided that the anonymous donor, at whose suggestion it was formerly resolved by the Court to endeavour to preserve the fabric of Greyfriars, but use it for academic purposes, will continue to offer 10,000l. to the extension scheme under the new proposal; and the committee further recommends that the Court appoint a small committee for the purpose of ascertaining the views of the donor, and with powers to confer thereafter with the Town Council and with the other parties to the agreement of May 2, 1893, in regard to the conditions of the new proposal, and to report to the Court. The report was adopted.

ABERDEEN BUILDING TRADES FEDERATION.—The third annual report of the Aberdeen Building Trades Federation states that the past year has been a prosperous one for the building trade. Several movements have been carried through with a certain measure of success, and there has happily been no serious dispute.

CARR'S PATENT LETTER-BOX—This is intended as a safeguard against the extraction of letters from letter-boxes. In order to raise the metal flap covering the opening of the letter-box, the catch A which projects outside the door has to be pressed, and at the same time the inner projecting end, B, of the catch, raises the upper side of the swinging box C, and brings the lower edge of it against the surface of the door, as in Fig. 2; the letters drop into C as into a kind of pocket, and on releasing the catch C returns to its normal position and the letters fall into the letter-box proper. Thus it will be seen that no one can introduce his hand, or any implement, through the outer slit of the letter-box without at the same time blocking the passage, and he could only get his hand into the empty pocket C instead of into the letter-box itself. The contrivance is simple and not likely to get out of order, and answers its purpose of giving protection to letters lying in the box. Mr. T. Carr, Bradford, is the patentee.

SALE, PUTNEY AND WANDSWORTH.—Messrs. Tuckett & Son offered by auction at the "White Lion" Hotel, High-street, Putney, on the evening of the 19th inst., the fourth and final portion of the Woodlands Freehold Building Estate, belonging to the trustees of the late James Spencer Bell, situate about midway between the districts of Putney and Wandsworth, and close to East Putney Railway Station. Sixty-two lots out of the sixty-four lots included in the particulars were disposed of for a total of 7,330l., the prices realised for the thirty shop plots in Putney Bridge-road ranging from 150l. to 158l. per plot, and those for the private house plots ranging from 82l. to 112l. per lot. We understand only a very few lots upon this estate now remain for disposal.

THE LANCASHIRE MASTER BUILDERS' FEDERATION.—A correspondent of the *Manchester Guardian* writes:—"The Lancashire and Cheshire Building Trades Employers' Federation, although only brought into existence a few months ago, is already fighting the men's trade unions in about twelve different towns in Lancashire, and there is every prospect of the struggle between capital and labour in the building trade being considerably extended by the end of the present month. The Federation was established to promote and further the interests of members, and, in particular, to protect and defend those interests against combinations of workmen seeking by strikes or other action to impose unduly restrictive conditions upon any branch of the trade. It will also deal with such questions as interference with foremen, unreasonable demands for wages, employment of apprentices, hours of labour, overtime, limitation of work, and the employment of men and boys on machines. By the rules members will be recouped under certain conditions for losses entailed by reason of strikes, and legal assistance will be given when deemed desirable. The Federation will promote the formation of conciliation boards or other provision for the equitable settlement of all differences between members and their workmen. It is further proposed that the Executive shall watch all legislative measures which may affect, or tend to affect, the interests of the building trades. The Executive consists of a number of local associations connected with the building trade throughout Lancashire and Cheshire, and such individual members as may be elected at meetings of the Federation or by the Executive Board. The latter authority have power to expel any member who, in their opinion, is acting against the interests of the Federation. This Executive Board, which manages the business of the Federation, consists of a president, two vice-presidents, and six members from Manchester, a similar number from Liverpool, and twenty-four from the rest of the Lancashire towns federated. In the future, however, associations becoming members will have the privilege of electing one out of every fifty, or portion of fifty, of their respective members to act on the Executive Board. The voting power is as follows:—Members paying, on a three years' average, not over 1,000l. per annum in wages, one vote; 1,000l. to 2,000l., two votes; 2,000l. to 5,000l. four votes; 5,000l. to 10,000l., six votes; and over 10,000l., eight votes. The wages of office and management staffs have not to be included in this reckoning. The annual subscription from the local associations is at the rate of 3s. per member, and for individual members 1l. 18s. and the Executive have power in the case of strikes to impose a levy not to exceed 1s. per cent. on the average annual wages paid in the past three years. Members of the Federation have in every case of dispute with the operatives to use inquiry forms, and are not allowed to employ any one on strike or locked out from the workshop of a member during the continuance of such strike."

DINNER, PORTSMOUTH BUILDERS.—A complimentary dinner was given by the Borough of Portsmouth Master Builders' Association to their Chairman, Mr. J. H. Corke, T.C., at the Sussex Hotel, recently, Mr. A. E. Porter (Vice-President) occupying the chair. Mr. T. Quick proposed "The Mayor and Corporation." The ex-Mayor (Mr. G. E.

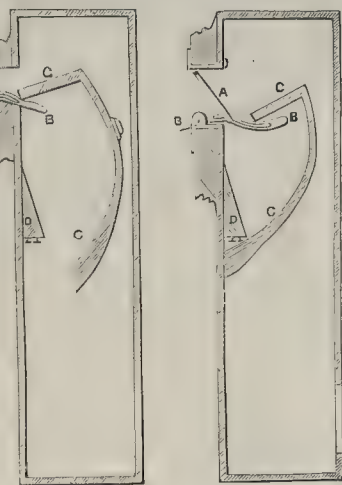


Fig. 1. Carr's Patent Letter-box. Fig. 2.

Couzens) replying, said everything concerning the town was in a prosperous state. Mr. Henry Jones proposed "The Guest of the Evening." He said they were all proud of their chairman. Mr. C. Dye, T.C., and Mr. W. J. Perkins added a few words concerning the services of Mr. Corke. Mr. J. H. Corke, in reply, said he was pleased an honourable understanding had been arrived at between the employers and themselves. Their association was more powerful than ever it had been. There were a few outside their ranks who had not yet joined them, but they had acted with them for years past and were acting with them now. He related the details of the strike business, and congratulated them on a settlement of the late difficulties. There was now a better feeling existing between employer and employees than ever existed before; there was a mutual confidence existing in place of what was a mutual distrust. Alderman Sir William King proposed the next toast, "The Borough of Portsmouth Master Builders' Association." Established twenty-six years, it had done a vast amount of good to the borough, not the least of its achievements being the settlement of the recent strike. Alderman Barnes, as an old member of the Association, responded. Mr. C. Dye, T.C., proposed "Our Visitors." Alderman G. Ellis, Mr. F. Power, T.C., Alderman A. L. Emanuel, and Mr. G. B. Addison (solicitor) responded. Mr. Corke proposed the health of Mr. Porter, and the Chairman responded. Other toasts were "The Treasurer," proposed by Mr. Alderman Barnes and responded to by Mr. C. Harding; and "The Secretary," proposed by Mr. W. G. Light, responded to by Mr. F. W. Simpson.

METROPOLIS MANAGEMENT ACTS AMENDMENT (BYLAWS) BILL.—In the House of Lords on the 20th inst., Lord Monckswell, in moving the second reading of this Bill, said it explained itself. It proposed to provide that the powers of the London County Council for making by-laws under Section 202 of the Metropolis Management Act, 1855, shall extend and apply to authorise the Council to make by-laws for the following purpose:—Requiring persons about to construct, reconstruct, or alter drains in connexion with buildings to deposit with the Sanitary Authority of the district such plans, sections, and particulars as may be necessary for the purpose of ascertaining whether such construction, reconstruction, or alteration is in accordance with the statutory provisions relative thereto, and with any by-laws made under the said section. The Bill proceeded on the principle that prevention was better than cure. He understood that the Government agreed to the Bill, but the difficulty with them was as to the Department to which they were to apply for sanction of the by-laws. Both the Home Office and the Local Government Board had declared that they were not the proper authority. He had not the slightest objection as to the body appointed to sanction the by-laws, but he wished the Bill to pass into law. After some observations from the Marquis of Salisbury and the Earl of Kimberley, the Bill was read a second time.

CAPITAL AND LABOUR.

STONEMASONS' STRIKE IN MANCHESTER.—The strike of stonemasons, which began on the 15th ult., remains unsettled. The operatives' notice, requiring certain alterations of existing rules and the addition of some new rules, expired on that date. The men were informed that the alterations and additions

could not be accepted, and they thereupon ceased work. The hon. secretary of the Masters' Association informs us that the masons had been working 40½ hours per week, and one of their demands was for a 47-hour week, with walking time night and morning, and an advance of a penny per hour (from 9d. to 10d.). The masters offered a halfpenny per hour advance. The men also take exception to a number of rules governing their employment, but the principal objection to the conditions which have hitherto prevailed relates to the employment of other than masons on stone-working machines. The men further protest against the importation of worked stone into Manchester or the taking of worked stone outside Manchester, limiting the work to a five-mile radius. They also seek to restrict the number of apprentices. If the men's demands are persisted in the strike is likely to last for some time. The employers are said to be supported by a strong Federation. The members of this body have already discharged 50 per cent. of the masons in their employment, and in the event of the strike not being settled soon they threaten to lock out the whole of the masons in the federated districts. The masters say that assistance by locking out in other counties has been promised. The Federation has only recently been formed. It includes the master builders of Liverpool, Manchester, Accrington, Ashton-under-Lyne, Birkenhead, Blackburn, Blackpool, Bolton, Burnley, Bury, Chorley, Darwen, Lancaster, Leyland, Longridge, Morecambe, Oldham, Preston, Radcliffe, Rochdale, Stockport, Wallasey, Warrington, and other towns. What the masters require is that they shall buy sawn or worked stone wherever it suits them, and also take it where they like, without interference, and also have a reasonable number of apprentices.—*Manchester Guardian*.

WAGES IN THE BUILDING TRADE, BLYTH.—It is stated that the master builders of Blyth have decided to grant the demand for an increase of a halfpenny per hour to joiners, mill-sawyers, &c., raising their wages to 9½d. per hour.

STRIKE OF BRICKLAYERS' LABOURERS, LOUGHBOROUGH.—It is stated that about fifty bricklayers and their labourers have come out on strike at Loughborough, in consequence of a builder in the town having employed non-union men on present contracts in Loughborough. The dispute originated with the labourers, and the bricklayers had perforce to cease work when they came out.

BUILDERS' LABOURERS' WAGES, SUNDERLAND.—The Sunderland builders' labourers have considered the offer of the Master Builders' Association of 1d. per hour advance in wages, and have rejected it.

MASONS' STRIKE, WEST STANLEY.—The strike of stonemasons and bricklayers at West Stanley has just terminated, the employers having conceded the advance in wages asked for of 10d. to 10d. per hour.

DISPUTE IN THE NOTTINGHAM BUILDING TRADE.—At a meeting of the Nottingham Master Builders' Association, held on the 15th inst. at the Mechanics' Institution, it was resolved that the present attitude of resistance to the labourers' demand for an advance of wages should be maintained. Reports have been circulated in the city that several members of the Builders' Association were paying the advance, but these reports were stated to be without foundation.

JOINERS' DISPUTE, LANCASTER.—The difficulties that threatened in the joiners' trade at Lancaster have been prevented. The masters offered an increase of a halfpenny per hour, commencing March next. The men, who now receive 7½d. per hour, have accepted the offer, also agreeing to 40½ hours in winter instead of 54, the rate of pay to be the same per hour.

THE DISPUTE IN THE SOUTH SHIELDS BUILDING TRADE.—The dispute between the South Shields stonemasons and the master-builders has, it is stated, been amicably settled, and the men have resumed work. An increase of one penny per hour has been granted, making the wage now paid 10d. per hour, with an eight hours' day.

BUILDERS' DISPUTE AT BLACKPOOL.—For some time the relations between the master builders and the bricksetters of Blackpool have not been of a very harmonious character, and the climax was reached on the 15th inst., when the Bricklayers' Union called out all the men in the town. The first steps were taken when the Union stopped all members from working that were not in receipt of the extra penny advance which was demanded some weeks ago. At that time the rate of a bricksetter's wages was 9d. per hour, and they then followed in the footsteps of the plasterers, who had succeeded in getting an increase from 9d. to 10d. The masters, in a few instances, had no alternative but to grant the request owing to important contract work in hand, and the fact that proprietors were pressing for a completion of the work. All the men on the Alhambra received the extra penny, and things were progressing very favourably until the 15th inst., when the contractors were informed that all the bricksetters were withdrawn. The decision of the Union has caused much indignation among the masters, who are evidently face to face with a grave difficulty.—*Manchester Evening News*.

THE JOINERS' DISPUTE IN THE HARTLEPOOL.—This dispute, which has now been in progress for several weeks. About one hundred men are affected, but a considerable number of these have been

drafted to other towns, where they have found employment. Originally arising out of the objection of the men to fix Canadian-made doors, the dispute has now resolved itself into a struggle between the masters and the men over the employment of non-unionists. The men state that they do not insist on the masters employing union hands, but they reserve to themselves the right to object to work beside men who willingly share in the advantages secured to labour by trade unionism, but hold aloof from the agitations by which these advantages are gained.—Since the above was in type the dispute, according to the daily papers, has terminated, and the men have accepted the masters' offer of 4d. per hour advance, instead of a 3d. as demanded.

THREATENED LOCKOUT OF LANCASHIRE STONEMASONS.—With the object of bringing to a speedy conclusion the present strike of stonemasons in Manchester and other Lancashire towns, the executive of the Lancashire and Cheshire Master Builders' Federation have decided to lock out all the men now at work in the two counties. The stonemasons of Liverpool are not yet involved in the dispute, though it is feared, if the matter is not settled in the other towns, they will be locked out. The dispute in the building trade has extended to Ashton-under-Lyne. The federated masters have locked out fifty per cent. of the stonemasons.

BLACKBURN JOINERS' ARBITRATION AWARD.—For close upon eleven months Blackburn joiners have been out on strike owing to a demand for an increase of wages from 8½d. to 9d. per hour and the reconstruction of rules. The latter was amicably arranged, and after much controversy the question of wages was referred to Mr. John Pickup, J.P., an arbitrator, who has just made his award in favour of the men.

STRIKE OF BOLTON PLASTERERS.—The Bolton Operative Plasterers have come out on strike for an increase in wages of one penny per hour, bringing their remuneration to tenpence per hour. They also ask for a reduction of hours in summer from fifty-two to forty-nine and a half weekly. The masters agree to the advance in wages, but refuse to grant the reduction of hours.

LEGAL.

EMPLOYERS' LIABILITY CASE.

An employers' liability action was tried at Plymouth County Court, recently, in which William Warn, holster, sought to recover from Messrs. Johnson & Co., contractors, Wandsworth Common, London, the sum of 200*l.* compensation for personal injury sustained by him on February 24 last, whilst employed on the new Palace Theatre building in Union-street.—Mr. Percy T. Pearce appeared for the plaintiff, and Mr. F. Cecil Leane for the defendant. After hearing the evidence, his Honour held that on the defendants' own story the plaintiff was entitled to recover compensation, as Gardiner, leading holster on the works, was undoubtedly negligent in leaving the superintendence of the work with which he was entrusted, and it was no excuse for him to say that he did so because they were short-handed. There was no evidence that the injury was of a permanent character, and he thought the justice of the case would be met in awarding the plaintiff the sum of 120*l.*, with costs, including special advocate's fee.

BUILDING COVENANT DISPUTE:

IMPORTANT DISCUSSION.

In the Chancery Division of the High Court of Justice, on the 17th inst., before Mr. Justice Romer, the case of *Townsend v. Rowley* came on for hearing as a motion by the plaintiffs for an injunction restraining the defendants from building in alleged contravention of certain covenants.

Mr. E. S. Ford appeared for the plaintiffs; and Mr. Levett, Q.C., and Mr. Eastwick for the defendants. Mr. Ford said the covenants in question were contained in an indenture dated April 21, 1891. The plaintiffs were the owners of the Downhill estates at Tottenham, and the predecessors of the defendants in title entered into a deed with them whereby the latter covenanted not to erect buildings except in a certain way. The defendants' predecessors covenanted that they would not erect any buildings which had not a frontage of 17 ft., and which were not of a rateable value of 30*l.* a year, and the buildings were to be used as private dwelling-houses only, the object of the deed being to secure as good a class of house and as good tenants as were on the Downhill estates. The defendants proposed to build (and had actually built) two houses in one, as it were, with a common entrance in the street. The houses were really double houses, self-contained, with no communication between the two. He (Mr. Ford) therefore submitted that these were two complete little houses, and that what the defendants had done was a breach of covenant. Mr. Ford added that the local authorities were treating these buildings as one house, and the defendants' case was that because the local authorities were treating the double house as one house, it was therefore one house within the meaning of the covenant.

Mr. Levett said the idea of the covenant was to prevent shabby-looking houses being erected with a frontage of less than 17 ft. Anyone looking at the

plan would see that the defendants' houses were the reverse of shabby, and they had a frontage of 28 ft. He submitted that this was all one house, because each building was comprised within four external walls with no party-wall.

His Lordship thought the covenant meant that each building should be a separate house with a frontage of not less than 17 ft., and of a rateable value of not less than 30*l.* a year. This was a design for two houses with a common hall.

Mr. Levett read the affidavit of Mr. Frederick Edward Eiloart, F.S.I., architect and surveyor, 40, Chancery-lane, who said that, in his opinion, although these houses were constructed for the accommodation of two families if required, they could only be considered as one house because the accommodation for each family was not divided by a party-wall, and because each building had only one front door and entrance hall, and only one service pipe for the supply of water, and one drain connected with the sewer. According to the by-laws of this and many other districts, continued the witness, party-walls at least 9 in. thick, and carried up at least 15 in. above the roof without any opening left in it, are required between each separate building, and also a separate service pipe and drain.

Mr. Levett said that Mr. Green, an architect, said the same thing.

His Lordship said there was nothing in common between these houses, except that they had a common hall and entrance, and there was no wall dividing the hall and lobby.

Mr. Levett submitted that a house could be built for two families, and in this case there was only one number to each double house.

His Lordship: Are two houses less two houses because they have a common hall?

Mr. Levett: Yes, if there is no party-wall. That is the test.

Mr. Ford said there was a divisional wall, but whether it was a party-wall or not was a question.

Mr. Levett said it was not of the proper thickness to be a party-wall.

His Lordship said he would have this case tried, as he should like to see the witnesses and to know more about this matter. He did not think it was easy to decide this case merely on affidavit evidence, because there was very likely a dispute as to the nature of this wall. He therefore directed the motion to stand for trial, with liberty to set it down at once.

IMPORTANT POINT UNDER THE METROPOLIS MANAGEMENT ACT, 1855.

THE case of *Allen v. the Fulham Vestry* came before Mr. Justice Day and Mr. Justice Ridley, sitting as a Divisional Court of Queen's Bench, on the 18th inst., on a special case stated by a Metropolitan Magistrate upon the hearing of three summonses issued by the Fulham Vestry under Section 226 of the Metropolis Management Act, 1855, on complaints that W. G. Allen and H. G. Norris had refused to pay 55*l.* 12s. 6d., and other appellants other sums, apportioned on premises belonging to them in respect of the estimated expenses of paving a portion of Wandsworth Bridge-road, called Section 4, under Section 105 of the Metropolis Management Act, 1855, and Section 75 of the Act of 1862. The main question to be decided was whether this was a "new street" within the Acts, for if it were the Vestry were entitled to apportion the expenses on the frontagers.

It appears that Wandsworth Bridge-road, of which Section 4 is part, forms a means of approach on the north side of Wandsworth Bridge, which was made pursuant to the Wandsworth Bridge Act, 1864, by the Wandsworth Bridge Company in August, 1872. The road then ran through agricultural land, and was bordered by market gardens. By Section 62 of that Act it was enacted that when the road was completed it should be deemed a public highway, and be repairable by the Fulham District Board of Works. In August, 1873, the road was made, but the Board thought it impracticable as a road and refused to accept it. On September 14, 1876, however, an agreement was entered into after negotiation and litigation. Under it the District Board of Works agreed with the Company, in consideration of the sum of 1,750*l.*, to complete and put in repair the Wandsworth Bridge-road, and to make it in all respects fit for the purposes of a public highway within the meaning of the Wandsworth Bridge Act, 1864, and the District Board undertook the liability of repairing the said road as imposed by the Act of 1864, and indemnified the Company from liability. In 1877 the Board made up the carriage way with flints rolled in over a hard core. After twelve months the carriage way was repaired with granite, and this process had been repeated by the Local Authority down to 1897. No channelling or kerbing was done, except that the road was repaired in a permanent way, and in the same mode as new streets with a similar amount of traffic were dealt with. Until 1890 there were no buildings upon the land adjoining the road, but in that year houses were erected on the east side, and in the years 1895 and 1896 houses were first built on the west side. On February 24, 1897, the Vestry of the Parish of Fulham passed a resolution that the road should be paved, and the costs apportioned on the

frontagers, it being proposed to pave it with wood blocks laid on a concrete foundation, which was more expensive than macadam. The Magistrate found that the road was not originally laid out as a street. The Vestry contended that the road became for the first time a new street when buildings were erected upon the land adjoining it, and that the Vestry had, when that was done, power to require the adjoining owners to pave it. It was also contended that wood-paving was "paving" within the meaning of the Acts of 1855 and 1862. The appellants contended that it was a "new street" when it was made by the company, and that it had, in 1877 and 1878, pursuant to the requirements of the Vestry, been, with the exception of the flagging of the foot-paths and of the channelling and kerbing of the carriage way, as well paved as streets with similar traffic were then required to be paved prior to its being taken over by the Vestry. Under Section 105 of the Metropolis Management Act, 1855, the Vestry could not now say that it was not then a new street. They also contended that assuming the Vestry had power to require the road to be paved, it had no power to require the carriage way to be paved up at the expense of the adjoining owners with wooden blocks on a concrete foundation. The Magistrate held (a) that the road was not in 1877 or 1878 a "new street"; (b) that it became a "new street" for the first time after the erection of houses therein, and that it was a "new street" in February, 1897; (c) that the Vestry was not prevented by anything done previously from requiring the road to be paved; and (d) that wood-paving was paving within the Acts. The Magistrate accordingly ordered the appellants to pay the Vestry the sum mentioned in the summonses, hence the present appeal.

At the conclusion of the arguments of counsel their lordships held that the Magistrate, having decided the case on a question of fact, viz., that the piece of road in question was a "new street," the matter could not be reviewed by the court, and the appeal was dismissed with costs.

Mr. Macmorran, Q.C., and Mr. R. C. Glen were counsel for the appellants; and Mr. Macaskie for the respondents.

BUILDING DISPUTE AT ACTON.

THE case of *Holford v. The Urban District Council of Acton* came before Mr. Justice Stirling in the Chancery Division on the 21st inst. for judgment, it being an action by the plaintiff for an injunction to restrain the defendants from erecting upon certain plots of land belonging to them a fire-engine station or any buildings other than shops and dwelling-houses of a certain value, in alleged breach of a condition of sale under which the plaintiff had bought from the defendants an adjoining plot of land. The land in question, together with other land, was originally acquired by the defendants, under their compulsory power, for the purpose of street improvements in their district. In 1894 they sold a portion of the land so acquired by auction under conditions of sale which provided (*inter alia*) that the respective purchasers of certain specified lots should in their respective conveyances enter into covenants with the vendors to erect, within two years from the day of sale, upon each of the lots bought by them, a shop and dwelling-house of not less value than 650*l.* The plaintiff bought one of the plots at the sale, and erected thereon a shop and dwelling-house in compliance with the condition. Certain of the plots were not sold, and the defendants had since been unable to sell the same. The defendants had recently determined to erect upon the plots remaining in their possession a fire-engine station which was required for the purposes of their district, and had obtained the sanction of the Local Government Board to the issue of a loan for the purpose of providing the necessary funds. The plaintiff then brought the present action, contending that the proposed erection of the fire station would be a breach of the condition under which he had bought his property, and by which the defendants were themselves bound.

Mr. Justice Stirling came to the conclusion that no negative stipulation could be implied in the condition. That being so, the restrictive covenant could not be enforced against the defendants, and so the action failed, and must be dismissed (except as to a special direction on one point) with costs as between solicitor and client.

MEETINGS.

FRIDAY, JUNE 24.

Carpenters' Company—Examination at Great Titchfield Schools. Practical work. 9.30 a.m. to 6.0 p.m.

SATURDAY JUNE 25.

Carpenters' Company—Examination: Carpenters' Hall 10.30 a.m. till 7.0 p.m.

MONDAY, JUNE 27.

Royal Institute of British Architects—Special General Meeting, adjourned from the 6th inst., to resume the consideration of the revised schedule of charges. 8 p.m.

WEDNESDAY, JUNE 29.

Builders' Foremen and Clerks of Works' Institution—Half-yearly meeting of the Directors. 8 p.m.

Five freehold cottages	28
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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Six Cottages, Penzance.	Sevenside R.D.C.	Not stated.	June 30.
Royal Institution Buildings.	Royal Institution Com.	50 gns. and 20 gns.	Aug. 31.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Additions to Schools, Barton Hill.	Bristol Sch. Bd.	W. L. Bernal, Archt. 3, St. Stephen's Chambers, Baldwin St., Bristol.	June 27
*Hospital.	Leicester Corp.	Blackwell & Thompson, Green-lane, Leicestershire.	June 28
Organ Chamber, &c. Wesleyan Chapel, Pool.	Lance & Yorks Ry. Co.	Engineer, Hunt & Bank, Manchester.	do.
Allotments Grain Warehouse, Chorley.	South Mims R.D.C.	G. D. Byfield, 16, High St., Bristol.	do.
Swimming Bath, Offices, &c.	Liverpool Corp.	J. Barry, C.E. Municipal Buildings.	do.
Alterations, Work Yard, &c.	Beckington Rural Bd.	J. C. Ogle, Archt. 34, Hamilton-square, Birkenhead.	do.
Chapel at Workhouse, near Bury St. Edmunds, Suffolk.	Thames Union.	T. D. Atkinson, Archt. 10, Cross-st., Abingdon.	do.
Relief Offices, New Bridge-street.	Manchester Union.	Mary's Passage, Cambridge.	June 29
Pipe Sewer.	Eastleigh U.D.C.	Surveyor, Council Offices, Bournemouth.	do.
Lodge, Derby Park.	Bottle Corp.	A. G. Meath, C.E. 4, Sale U.D.C.	do.
Severing London-street.	Sale U.D.C.	A. G. Meath, C.E. 4, Sale U.D.C.	do.
Guernsey Granite.	Christchurch Corp.	R. J. Legg, Boro. Surv. Town Hall.	do.
Wooden Buildings at Asylum.	Monmouthshire Asylum.	R. J. Legg, Boro. Surv. Town Hall.	do.
Hotel, Kinloch Rannoch.	Cairn, Westworth.	W. J. Legg, Boro. Surv. Town Hall.	do.
Severing London-street.	Tandil U.D.C.	B. H. Legg, Boro. Surv. Town Hall.	do.
*Sewerage Works.	Berkhamstead U. & R.D.C.	J. Legg, Boro. Surv. Town Hall.	do.
Baptist Chapel, Lodge, Brynbo, near Wrexham.	Warcester Corp.	W. J. Legg, Boro. Surv. Town Hall.	do.
Wrought Iron Pumping, Cliff road.	Warcester Corp.	W. J. Legg, Boro. Surv. Town Hall.	do.
Science and Art Schools, Newark.	Heanor U.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Residence, Victoria-st. Barnsley.	Heanor U.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Granite and other Road Metal.	Heanor U.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Manse, Tarrill Park, Coppar, Fife.	Heanor U.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Pipe Sewer, Moss Carr.	Heanor U.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Sewerage Works, Frodsham Lordship.	Runcorn R.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Chapel Schoolroom, New Tredgar.	Mon. Trusts.	W. J. Legg, Boro. Surv. Town Hall.	do.
Storage Tank, Auchingrae.	Ayrshire C.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Reservoirs, Chatham.	Kent County Asylums Committee.	W. J. Legg, Boro. Surv. Town Hall.	do.
Stores, Stables, &c. Broadway, Chesham.	Co-op Soc. Ltd.	W. J. Legg, Boro. Surv. Town Hall.	do.
Foundations, Bridge Work, &c. Bournemouth.	Bristol Dock Co.	W. J. Legg, Boro. Surv. Town Hall.	do.
Alterations to Library, &c. &c.	Andover T.O.	W. J. Legg, Boro. Surv. Town Hall.	do.
Additions to Schools.	Attleborough Sch. Bd.	W. J. Legg, Boro. Surv. Town Hall.	do.
Fighting Works at Bath.	Hull Corp.	W. J. Legg, Boro. Surv. Town Hall.	do.
Rebuilding Church, Wolfedale, Camrose, Penzance.	Alton U.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Outfall Sewer, &c.	Alton U.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
Steading at Lun Farm, Belhelvie, N.B.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Two Villas, Antrim.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Gala Lodge, Corbeagh, Ireland.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
*Timber Drying Shed.	Midland R. Co.	W. J. Legg, Boro. Surv. Town Hall.	do.
Valves, Pipes, Fittings, &c.	Nottingham Corp.	W. J. Legg, Boro. Surv. Town Hall.	do.
Hotel, Landanow-nd, Canton, Cardiff.	W. Hancock & Co. Ltd.	W. J. Legg, Boro. Surv. Town Hall.	do.
Rebuilding Inn at Bideford.	F. Othland.	W. J. Legg, Boro. Surv. Town Hall.	do.
Isolation Hospital.	Cheshire St. R.D.C.	W. J. Legg, Boro. Surv. Town Hall.	do.
*20,000 Bricks.	Bermondsey Vestry.	W. J. Legg, Boro. Surv. Town Hall.	do.
Factory Buildings, Kirkdale, Liver.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Detached Residence, &c. Eaglecliffe Junction.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Sewerage, &c. Chelmsford-street.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Public Library, Brunswick-road.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Stoneware Pipe Sewers, &c. Aldridge.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Coalward Station, Arthurstown, co. West.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Sewers, &c. &c.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
*Making-up, &c. Roads.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
*Offices adjoining Workhouse.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
*Broken Granite.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
*Sewers.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Concrete Paving.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Additions to Hospital.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Offices and Shops, Southgate, Halifax.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.

CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Laboratory at Grammar School, Worcester.	Governors.	A. H. Parker, Archt. 5, Fore-street, Worcester.	July 5
Cart Shed, &c. Chapel.	Southampton Corp.	W. B. O. Bennett, Engr. Municipal Office.	do.
*Kerbing, Tar Paving, Metalling, &c.	Lewisham B. of W.	Survey's Dept. B. of W. Office, Cardiff, S.W.	do.
*Wood Paving and Granite Pitching.	Westminster Vestry.	G. R. W. Wheeler, Town Hall, Canton street, S.W.	July 6
*Furnace, &c. at Infirmary.	Paddington U.D.C.	T. H. Knightley, 106, Cannon-street, E.C. 4.	do.
*Painting, &c. at Workhouse.	do.	O. H. Smith, 3, Chancery-lane, S.W.	do.
*Underground Con-crete Chamber.	do.	do.	do.
Cement Footpaths, South View, &c.	Jarrow U.S.A.	Borough Surveyor, Clatter House, Kingston-on-Thames.	July 7
Two Roads, Larn.	E. Cory.	Chichester-street, Belfast.	do.
*Painting, &c. at Schools.	Wanstead S.B.	J. T. Bremer, 70 and 71, Chancery-street, S.W.	July 8
Additions to School, West Finchbeck, near Spalding.	Baling U.D.C.	C. Jones, Public Buildings, Baling, S.W.	July 11
*Various Materials and Hire of Horse.	Rochester A.S.B.	O. H. Smith, High-street, S.W.	do.
*School.	Metropolitan A.S.B.	A. & C. Harrison, 15, Leadenhall-street, E.C. 3.	do.
*Destructive House and Destructor at Reservoirs, Ogden and Blackmoor.	Neison Corp.	Copper-street, Manchester.	July 10
*Building for Staff at Infirmary.	Barnet U.D.C.	W. H. Mansbridge, 40, High-street, S.W.	do.
*New Bridge at Vauxhall, &c.	London C.C.	Engineer's Dept. County Hall, S.W.	July 13
*Asphalt and York Stone Paving.	Carlton U.D.C.	R. Whitbread, Surv. Barton-road, Carlton, S.W.	do.
*Road Making, &c.	South Croxland U.D.C.	W. Ruffell, C.P.E. Angel-row, Nottingham.	do.
Sewerage Works, near Hudders.	Honley U.D.C.	J. Waugh, C.E. Sunbridge-church, Bradford.	do.
*Sewerage Works, near Hudders.	St. George's Union.	C. E. Vaughan, 25, Leithers-arcade, W. 10.	do.
*Painting, Repair, Cleaning.	St. George's Union.	J. M. Mason, 2, Manor-st.	do.
*Chapel at Souththorpe, Lincoln.	Adamson & Co.	Johnstone Bros. 30, Low-land-street, Carlisle.	No date
*Work at Ham Curing Establishment.	Admission to Minerva Chins Works.	Ellis, Jones, Archt. 20, Albion-street, Hales.	do.
Additions to Minerva Chins Works.	Admission to Minerva Chins Works.	Northampton Archt.	do.
Hotel, Pontypridd, Glam.	Admission to Minerva Chins Works.	W. Hall, Archt. 12, St. R. at Northampton.	do.
Road Works, Roslin-street.	Aberdeen Corp.	Cook & Edwards, Archt.	do.
Additions to Licensed House, York-road and Harrow-street, Belfast.	F. McKernan.	W. Dyack, Engr. Town Hall, S.W.	do.
Block of New House, Fairford, Belfast.	J. Finney.	J. Moore, Archt. 20, Street, Belfast.	do.
Enlarging Royal Naval Arms Inn, Devonport.	Mrs. Bowditch.	E. M. Leest, Archt. 109, Free-street, Devonport.	do.
House and Premises, New Tredgar.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Warehouse, Suspension Mills, Lister, &c.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Club Buildings, Pudsey.	W. J. Legg, Boro. Surv. Town Hall.	W. J. Legg, Boro. Surv. Town Hall.	do.
Cottage Hospital, Hanwell, W.	Committee.	H. A. Reid, Archt. District Council Office, Hanwell.	do.
Two Houses, South Church.	T. Ord.	F. H. Liver, Archt. Market-place, Bishop Auckland.	do.
Refectories, &c. at Garswode.	Ashford U.D.C.	Stevens & Bursell, 10, Pall-mall, S.W.	do.
Road Works, King's-street, &c.	Middlebrough Corp.	F. Baker, C.E. Municipal Buildings.	do.
Cast-iron Pipes.	Belfast Corp.	V. A. H. McCowen, City Engineer, Belfast.	do.
Additions to Boot Factory, Armley.	D. Evans & Sons.	C. F. Wilkinson, Archt. 10, Park-square, Leeds.	do.
Additions to Schools.	Walpole St. Andrew Sch. Bd.	G. Thomas, Archt. Chesham-street, Walsby.	do.
Shed at the Workhouse.	Worcester Union.	H. Rowe & Sons, Archt. Pierpoint-st. Worcester.	do.
Drainage Works at Borough Asylum, &c.	W. J. Legg, Boro. Surv. Town Hall.	J. Little, Railway Engr. Victoria-church, Carlisle.	do.
Block of Dwellings, Falls road, Belfast.	J. Kinney.	W. I. Moore, Archt. Ann-street, Belfast.	do.
House, Colchester-road, Halstead.	W. Simmons.	Gowley & Cressall, Archt. Victoria-church, Colchester.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom advertised.	Salary.	Applications to be in.
*Building and Drainage Inspector.	Chirk U.D.C.	£3. 10s. per week.	June 29
*Building Inspector and Clerk of Works.	County Boro. of Burnley.	120s. rising to 150s. per an.	July 4
*Drainage and Buildings Inspector.	Erith U.D.C.	150s. per annum.	do.
*Drainage-man.	Margate Corp.	140s. per annum.	do.
*Chief Surveying and Surveying Assistant.	Huddersfield Corp.	180s. per annum.	July 12
*Assistant Building Inspector.	do.	120s. per annum.	do.
*Temporary Surveying Assistant.	do.	120s. per annum.	do.
*Road Foreman.	do.	120s. per annum.	do.
*Clerk of Works.	Barnet U.D.C.	120s. per annum.	July 16
*Clerk of Works.	do.	120s. per annum.	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, pp. iv. vii. & viii. Public Appointments, pp. xvi. xviii. & xix.

Eastington, Glos.—"Middlehall Farm," 57 a. 2 f. 15 p. f.	Bartholomew-st., "The Back Boys" Hotel, 1, 1, 45 f.	By Barker & Neale.	By Barker & Neale.
Wapley, &c., Glos.—"Sergeant's Farm," 65 a. 3 f. 13 p. f.	Newbury, Berks.—London-rd., "The Cross Keys" P.-h., and residence adjoining, area 9,900 ft. 2 f. 70 p. f.	YTS, &c. 170s.	YTS, &c. 170s.
Charfield, Glos.—"Townsend Farm," 43 a. 1 f. 12 p. f.	Newbury, Berks.—The Broadway, "Hunt's Bar" P.-h. and house adjoining, f. 3,000.	£16,390	£16,390
Upwell, Norfolk.—"Nealmoor Hall Farm," 46 a. 1 f. 17 p. f.	Newbury, Berks.—"The Old London Apprentice" P.-h., f. 28 f.		
June 13.—By DREWETT & WATSON.	Wash Common, "The Gun" P.-h., f. 29 f.		
Newbury, Berks.—Bartholomew-st., "The Tiger" P.-h., f. 47 f. 55.			

Contractions used in these lists.—P.g. for freehold ground-rent; L.g. for leasehold ground-rent; L.g. for improved ground-rent; g. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u. for unexpired term; p. a. for per annum; y. for years; s. for square; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

Accepted.

LONDON.—For alterations, &c., to the "King's Head" public-house, Walworth-road. Mr. Ingram architect:—
Beer & Gash £1,500
Maxwell 1,500
Corney & Fairbairn 1,500
W. Shummar 1,500

LONDON.—For the erection of boundary walls, &c., at Gainsborough-road, Hackney Wick, N.E., for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 75, Finsbury-pavement, E.C.:—
Barrett & Power £4,645
S. R. Lambie (accepted) £4,174

LONDON.—For repairing and redecorating the Relief Offices, Mayfield-road, Dalston, N.E., for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 75, Finsbury-pavement, E.C.:—
Denman £1,791
Barrett & Power 450
Suk 335
Harris 290
Innes 230
* Accepted.

LONDON.—Accepted for eight new studios, Chelsea Reach. Mr. W. J. Chambers, architect, Savoy House, W.C.:—
C. Fildes, Working £1,500

LOUGHTON.—For eight pairs of villas and thirteen houses, for Mr. A. F. Hills, Messrs. F. & H. Francis, architects:—
Warren £22,220
F. Foster 21,150
W. Shummar 20,075
Coxhead 19,761

MANCHESTER.—For forming new roadways, kerbing, sewerage, channelling, &c., on the First Estate, Fallowfield, for Mr. W. Wood, Messrs. C. K. T. C. Mayor, architects and surveyors, 41, John Dalton-street, Manchester:—
J. Hearn £1,573
J. P. Willan 1,000
G. Bodas 990
* Accepted.
Worthington & Powell, Cheltenham £7,600
N. Taylor & Sons 2,500

MERTON (Surrey).—For the erection of three houses, for Mr. W. C. Ware, Mr. H. P. Burke Downing, architect, 7, Great College-street, Westminster:—
R. S. Rowland £2,271
J. James Burgess £2,272
John Garrett & Son 2,188
G. P. H. Barnes 2,000

PENZANCE.—For the erection of a vicarage, St. John's parish. Mr. Oliver Caldwell, architect, Penzance:—
Matory.

I. Furness £745
E. Pedwell 718
* Accepted.
Carpenter, Trinity, Plymouth, &c.
R. Walters £46 10
Tucker 615
W. Tinsman 614
Total, £1,256 15s.
* Accepted.
[Architect's estimate, £1,273]

PONDERS' END.—For railway hotel and theatre, for Messrs. Reid & Co., Mr. H. M. Wakley, architect:—
Holland & Co. £11,706
Lassells & Co. 11,377
F. & H. F. Higgs 11,148
W. Shummar 10,751
Patman & Fortheargham 10,751
Deaning & Son 10,751

RUSHDEN.—For the erection of additions to Windmill Club and Institute. Messrs. Mosley & Anderson, architects, Northampton:—
Mitchell £910
Bradshaw & Cooper 881
Dickens Bros. 869
Hackley Bros. 857
Sparrow 839
Whittington & Tomlin £895
Wilmott 889
Marnett 828
Hensor, Finedon 810
* Accepted.

STAFFORD.—For the execution of drainage works at the workhouse, for the Union Guardians. Mr. H. T. Sandy, architect and surveyor, Stafford:—
C. J. Nevitt £975
F. Exley & Sons 940
J. A. Corcoran 947
Withdrawn.
A. F. Whitmore £740
T. T. Staff. 670
* Accepted, but afterwards withdrawn.

SUTTON (Surrey).—For alterations and additions to Cumberland Lodge, Carshalton-road, Sutton. Mr. H. A. Emmett, architect, Tunbridge Park, N.:—
Geo. Newton £1,121
D. Waller 1,121
Houghton & Son £864
H. Clark, Carshalton 876

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THEYDON BOIS.—For additions and alterations to "Furieu," Theydon Bois, Essex, for Mr. E. A. Kuntz, Mr. W. A. Finch, architect, 75, Finsbury-pavement, E.C.:—
Darey £1,100
Burgett & Power £844
Forster 788
S. R. Lambie (accepted) 640
J. Keen 640

WALTHAMSTOW.—For houses at Helena-road, Walthamstow. Messrs. Purvis & Purvis, architects:—
S. Scott £2,720
Baron 2,220
J. Reed 2,118
W. Shummar £2,721
German 2,100

WAREHAM.—For additions to the workhouse, for the Union Guardians. Mr. W. W. Fockes, architect, Wareham. Quantities by architect:—
John Laws, Wareham £330

WEST HANNINGFIELD (Essex).—For alterations and additions to the Chumney Farm, for Mr. Perkins. Mr. George C. Clark, architect, Chelmsford:—
E. West £45
H. Potter 45
J. E. Rayner, Hanningfield £44 10
* Accepted after modifications.

WINDSOR.—For erecting a house and stable, Windsor, for Mr. A. W. Benyon. Mr. A. E. Siffard, architect, Wokingham:—
House. Stables.

Halls & Sons £2,648
Kearney 2,568
Willott 2,570
Waters 2,448
Bottrill 2,417
Satchwell, Egham 2,408
* Accepted, with additions, £2,600.

YARM (Yorkshire).—For widening Leven county bridge, for the North Riding County Council. Mr. Walter Seal, C.E., County Surveyor, Northampton:—
A. Atkinson & Co. £698 10
W. Blackburn, Brough 775
ton, Malton 762
* Accepted.

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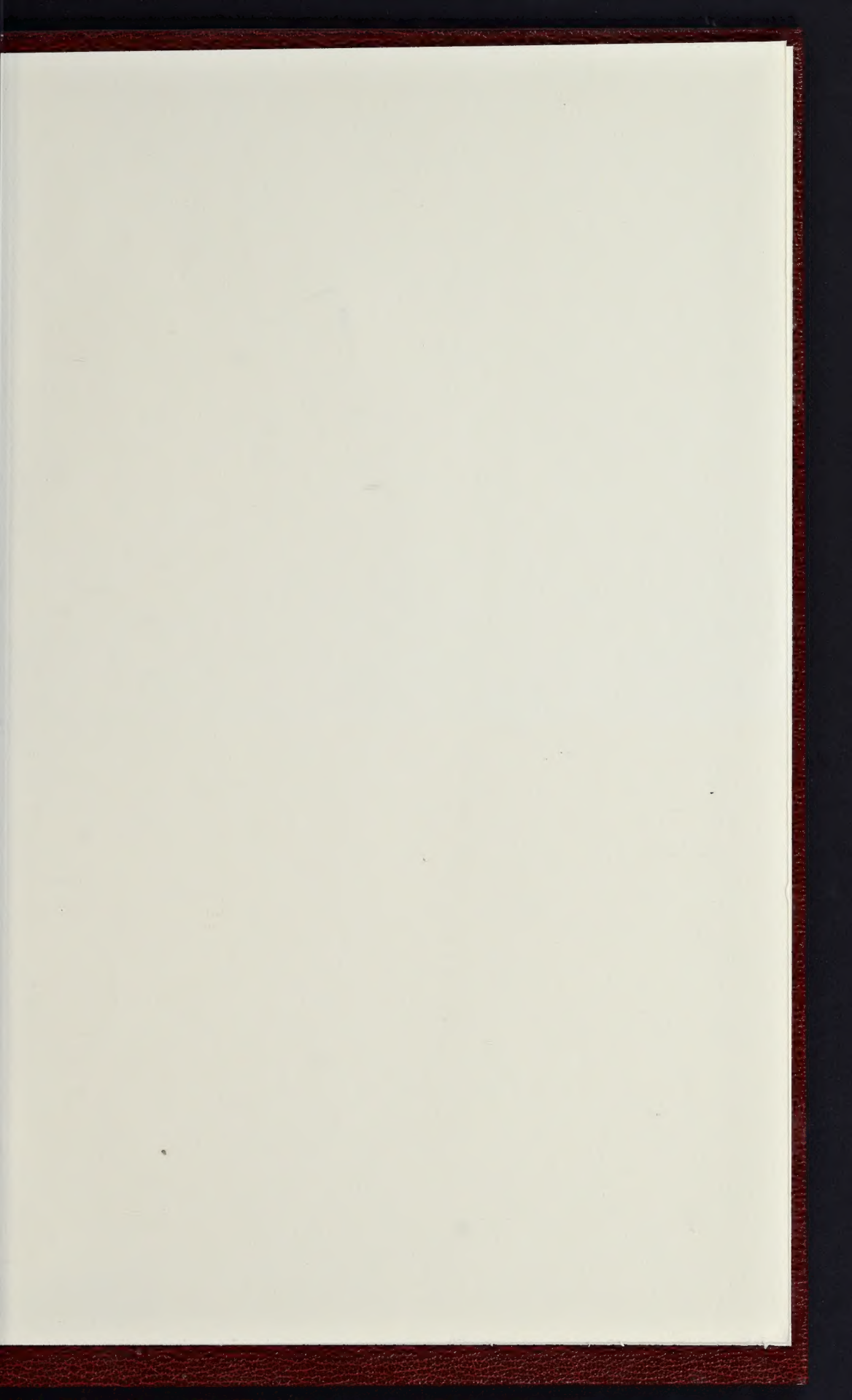
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